



Estd.2001

Sri Indu

College of Engineering & Technology

UGC Autonomous Institution

Recognized under 2(f) & 12(B) of UGC Act 1956,

NAAC, Approved by AICTE &

Permanently Affiliated to JNTUH



NAAC

NATIONAL ASSESSMENT AND
ACCREDITATION COUNCIL



HANDOUT

II Year II Semester

DEPARTMENT OF INFORMATION
TECHNOLOGY

ACADEMIC YEAR 2024-2025



SRIINDU COLLEGE OF ENGINEERING & TECHNOLOGY

(An Autonomous Institution under UGC, New Delhi)

(Permanently Affiliated to JNTUH, Approved by AICTE, New Delhi and Accredited by NBA, NAAC)
Sheriguda Village, Ibrahimpatnam Mandal, Ranga Reddy Dist. – 501 510

DEPARTMENT OF INFORMATION TECHNOLOGY

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SRI INDU COLLEGE OF ENGINEERING & TECHNOLOGY

B. TECH –INFORMATION TECHNOLOGY

INSTITUTION VISION

To be a premier Institution in Engineering & Technology and Management with competency, values and social consciousness.

INSTITUTION MISSION

IM₁ Provide high quality academic programs, training activities and research facilities.

IM₂ Promote Continuous Industry-Institute Interaction for Employability, Entrepreneurship, Leadership and Research aptitude among stakeholders.

IM₃ Contribute to the Economical and technological development of the region, state and nation.

DEPARTMENT VISION

To be a recognized knowledge center in the field of Information Technology with self - motivated, employable engineers to society.

DEPARTMENT MISSION

The Department has following Missions:

DM₁ To offer high quality student centric education in Information Technology.

DM₂ To provide a conducive environment towards innovation and skills.

DM₃ To involve in activities that provide social and professional solutions.

DM₄ To impart training on emerging technologies namely cloud computing and IOT with involvement of stake holders.

PROGRAM EDUCATIONAL OBJECTIVES (PEOs)

PEO1: Higher Studies: Graduates with an ability to apply knowledge of Basic sciences and programming skills in their career and higher education.

PEO2: Lifelong Learning: Graduates with an ability to adopt new technologies for ever changing IT industry needs through Self-Study, Critical thinking and Problem solving skills.

PEO3: Professional skills: Graduates will be ready to work in projects related to complex problems involving multi-disciplinary projects with effective analytical skills.

PEO4: Engineering Citizenship: Graduates with an ability to communicate well and exhibit social, technical and ethical responsibility in process or product.

PROGRAM OUTCOMES (POs) & PROGRAM SPECIFIC OUTCOMES (PSOs)

PO	Description
PO 1	Engineering Knowledge: Apply knowledge of mathematics, natural science, computing, engineering fundamentals and an engineering specialization as specified in WK1 to WK4 respectively to develop to the solution of complex engineering problems.
PO 2	Problem Analysis: Identify, formulate, review research literature and analyze complex engineering problems reaching substantiated conclusions with consideration for sustainable development. (WK1 to WK4)
PO 3	Design/Development of Solutions: Design creative solutions for complex engineering problems and design/develop systems/components/processes to meet identified needs with consideration for the public health and safety, whole-life cost, net zero carbon, culture, society and environment as required. (WK5)
PO 4	Conduct Investigations of Complex Problems: Conduct investigations of complex engineering problems using research-based knowledge including design of experiments, modelling, analysis & interpretation of data to provide valid conclusions. (WK8).
PO 5	Engineering Tool Usage: Create, select and apply appropriate techniques, resources and modern engineering & IT tools, including prediction and modelling recognizing their limitations to solve complex engineering problems. (WK2 and WK6)
PO 6	The Engineer and The World: Analyze and evaluate societal and environmental aspects while solving complex engineering problems for its impact on sustainability with reference to economy, health, safety, legal framework, culture and environment. (WK1, WK5, and WK7).
PO 7	Ethics: Apply ethical principles and commit to professional ethics, human values, diversity and inclusion; adhere to national & international laws. (WK9)
PO 8	Individual and Collaborative Team work: Function effectively as an individual, and as a member or leader in diverse/multi-disciplinary teams.
PO 9	Communication: Communicate effectively and inclusively within the engineering community and society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations considering cultural, language, and learning differences
PO 10	Project Management and Finance: Apply knowledge and understanding of engineering management principles and economic decision-making and apply these to one's own work, as a member and leader in a team, and to manage projects and in multidisciplinary environments.
PO 11	Life-Long Learning: Recognize the need for, and have the preparation and ability for i) independent and life-long learning ii) adaptability to new and emerging technologies and iii) critical thinking in the broadest context of technological change. (WK8)
Program Specific Outcomes	
PSO 1	Software Development: To apply the knowledge of Software Engineering, Data Communication, Web Technology and Operating Systems for building IOT and Cloud Computing applications.
PSO 2	Industrial Skills Ability: Design, develop and test software systems for world-wide network of computers to provide solutions to real world problems.
PSO 3	Project implementation: Analyze and recommend the appropriate IT Infrastructure required for the implementation of a project.

COs MAPPING WITH POs & PSOs

Discrete Mathematics

Course Outcomes	Statements
C211.1	Ability to understand and construct precise mathematical proofs
C211.2	Ability to use logic and set theory to formulate precise statements
C211.3	Ability to analyze and solve counting problems on finite and discrete structures
C211.4	Ability to describe and manipulate sequences
C211.5	Ability to apply graph theory in solving computing problems
C211.6	Ability to apply Trees, Applications of Trees, Tree Traversal, Spanning Trees, Minimum Spanning Trees problems

Course Articulation Matrix:

Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PSO 1	PSO 2	PSO 3
C211.1	3	2	-	-	3	-	2	-	-	-	-	2	3	2
C211.2	3	3	-	2	2	-	-	-	-	-	-	3	3	2
C211.3	3	3	-	2	2	-	2	-	-	-	-	3	3	2
C211.4	3	2	3	2	-	-	2	-	-	-	-	3	2	1
C211.5	3	3	3	3	2	-	-	-	3	-	-	3	3	1
C211.6	3	3	3	3	-	-	2	-	3	-	-	3	3	1
C211	3	2.8	3	2.6	2.2	-	2	-	3	-	-	2.8	2.8	1.5



Lr.No.SICET/AUTO/DAE/III B.Tech Academic Calendar/85/2024

B.TECH III-YEAR I-SEM & II-SEM ACADEMIC CALENDAR
(FOR ACADEMIC YEAR : 2024-25)

Academic Calendar for B.Tech – IIIrd Year Students (2022 - 23 Batch), BR-22 Regulation.

I – Semester

S.No.	EVENT	PERIOD	DURATION
1.	Commencement of class work.	22.07.2024 (Monday)	
2.	1 st Spell of Instructions for covering First Two and a half Units.(Including CRT training Classes)	22.07.2024 – 28.09.2024	10 Weeks
3.	I Mid Term Examinations.	30.09.2024 – 05.10.2024	5 Days
4.	Submission of I Mid Term Examination Marks.	09.10.2024	
5.	2 nd Spell of Instructions for Remaining Two and a half Units.	14.10.2024 – 14.12.2024	9 Weeks
6.	II Mid Term Examinations.	16.12.2024 – 18.12.2024	3 Days
7.	Preparation Holidays and Practical Examinations	19.12.2024 – 28.12.2024	1 Week 3 Days
8.	Submission of II Mid Term Examination Marks.	27.12.2024	
9.	I Semester End Examinations.	30.12.2024 – 18.01.2025	3 Weeks
Commencement of Class-Work for III B.Tech - II Semester 20.01.2025 (Monday)			

Note: No of Working/instructional days : 99

II – Semester

S.No.	EVENT	PERIOD	DURATION
1.	Commencement of class work.	20.01.2025 (Monday)	
2.	1 st Spell of Instructions for covering First Two and a half Units.	20.01.2025 – 22.03.2025	9 Weeks
3.	I Mid Term Examinations.	24.03.2025 – 26.03.2025	3 Days
4.	Submission of I Mid Term Examination Marks.	02.04.2025	
5.	2 nd Spell of Instructions for Remaining Two and a half Units.	27.03.2025 – 10.05.2025	6 Weeks 3 Days
6.	Summer Vacation	12.05.2025 – 24.05.2025	2 Weeks
7.	Continuation of 2 nd Spell of Instructions for Remaining Two and a half Units.	26.05.2025 – 11.06.2025	2 Weeks 3 Days
8.	II Mid Term Examinations.	12.06.2025 – 14.06.2025	3 Days
9.	Preparation Holidays and Practical Examinations	16.06.2025 – 21.06.2025	1 Week
10.	Submission of II Mid Term Examination Marks.	19.06.2025	
11.	II Semester End Examinations	23.06.2025 – 05.07.2025	2 Weeks
12.	Commencement of Class-Work for IV B.Tech - I Semester	07.07.2025(Monday)	

Note: No of Working/instructional days : 98

[Signature]
ACE

Controller of Examination
Sri Indu College of Engineering & Technology
(An Autonomous Institution Under UGC)
Sheriguda (V), Ibrahimpatnam, R.R. Dist-501510.

[Signature]
DIRECTOR

Sri Indu College of Engineering & Technology
(An Autonomous Institution Under UGC)
Sheriguda (V), Ibrahimpatnam, R.R. Dist-501510.

[Signature]
PRINCIPAL

Sri Indu College of Engineering & Technology
(An Autonomous Institution Under UGC)
Sheriguda (V), Ibrahimpatnam, R.R. Dist-501510.

Sign: *[Signature]*

Dr. M.V.S.S. Giridhar
Prof. of CEA; JNTUH Nominee

Sign: *[Signature]*

Dr. T. Venu Gopal
Prof. of CSE; JNTUH Nominee

Sign: *[Signature]*

Dr. D. Ramesh
Prof. of CSE; JNTUH Nominee

DISCRETE MATHEMATICS



SRI INDU COLLEGE OF ENGG & TECH
SYLLABUS
(Regulation :R22)
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BR22 - B.TECH. - COMPUTER SCIENCE & ENGINEERING

SRI INDU COLLEGE OF ENGINEERING & TECHNOLOGY
(An Autonomous Institution under UGC, New Delhi)

B.Tech. - II Year – II Semester

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(R22CSE2111) DISCRETE MATHEMATICS

Course Objectives:

- Introduces elementary discrete mathematics for computer science and engineering.
- Topics include formal logic notation, methods of proof, induction, sets, relations, algebraic structures, elementary graph theory, permutations and combinations, counting principles; recurrence relations and generating functions.

Course Outcomes:

- Understand and construct precise mathematical proofs
- Apply logic and set theory to formulate precise statements
- Analyze and solve counting problems on finite and discrete structures
- Describe and manipulate sequences
- Apply graph theory in solving computing problems

UNIT - I

Mathematical logic: Introduction, Statements and Notation, Connectives, Normal Forms, Theory of Inference for the Statement Calculus, The Predicate Calculus, Inference Theory of the Predicate Calculus.

UNIT - II

Set theory: Introduction, Basic Concepts of Set Theory, Representation of Discrete Structures, Relations and Ordering, Functions.

UNIT - III

Algebraic Structures: Introduction, Algebraic Systems, Semi groups and Monoids, Lattices as Partially Ordered Sets, Boolean Algebra.

UNIT - IV

Elementary Combinatorics: Basics of Counting, Combinations and Permutations, Enumeration of Combinations and Permutations, Enumerating Combinations and Permutations with Repetitions, Enumerating Permutation with Constrained Repetitions, Binomial Coefficient, The Binomial and Multinomial Theorems, The Principle of Exclusion.

UNIT - V

Graph Theory: Basic Concepts, Isomorphism and Subgraphs, Trees and their Properties, Spanning Trees, Directed Trees, Binary Trees, Planar Graphs, Euler's Formula, Multi-graphs and Euler Circuits, Hamiltonian Graphs, Chromatic Numbers, The Four-Color Problem.

TEXT BOOKS:

1. Discrete Mathematical Structures with Applications to Computer Science: J.P. Tremblay, R. Manohar, McGraw-Hill, 1st ed.
2. Discrete Mathematics for Computer Scientists & Mathematicians: Joe I. Mott, Abraham Kandel, Teodore P. Baker, Prentis Hall of India, 2nd ed.

REFERENCE BOOKS:

1. Discrete and Combinatorial Mathematics - an applied introduction: Ralph.P. Grimald, Pearson education, 5th edition.
2. Discrete Mathematical Structures: Thomas Kosy, Tata McGraw Hill publishing co.



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LESSON PLAN
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AcademicYear:2024-25	Year/Sem./Section	AcademicYear:2024-25	
Faculty Name&Designation	S. VARSHA REDDY ASST PROF		

Unit/ Item No.	Topic (s)	Book Reference	Page (s)		Teaching Methodology	Proposed No. of Periods	Actual Date of Handled	CO/RBT
			From	To				
UNIT-I								
I	Introduction					14		
1.1	The Foundations: Logic and Proofs: Mathematical logic	T1	1	16	Black board	02		CO1, L2
1.2	Statements and Notation	T1	16	25	Black board	01		CO1, L2
1.3	Connectives	T1	25	36	Power point Presentation	02		CO1, L2
1.4	Normal Forms	T1	36	57	Black board	01		CO1, L2
1.5	Theory of Inference for the Statement Calculus	T1	57	69	Black board	01		CO2, L4
1.6	The Predicate Calculus	T1	69	80	Black board	02		CO2, L4
1.7	Inference Theory of the Predicate Calculus	T1	80	92	Black board	02		CO2, L4
1.8		T1	92	109	Black board	02		CO2, L4
1.9	Revision on 1 st unit	T1	1	109	Black board	01		CO2, L4
	Review	Signature of the HOD/Coordinator						
Unit/ Item No.	Topic (s)	Book Reference	Page (s)		Teaching Methodology	Proposed No. of Periods	Actual Date of Handled	CO/RBT
UNIT –II								
II	Introduction					21		
2.1	Set Theory :Introduction	R4	115	115	Black board Presentation	01		CO3, L3



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Unit/ Item No.	Topic (s)	Book Reference	Page (s)		Teaching Methodology	Proposed No. of Periods	Actual Date of Handled	CO/RBT	
			From	To					
2.2	Sets	T1	115	127	Black board	02		CO 3, L3	
2.3	Basic Concepts	T1,R4	127	130	Power point Presentation	01		CO 3, L3	
2.2	Set Theory	T1,R4	130	133	Power point Presentation	01		CO 3, L3	
2.3	Types	T1	133	138	Black board	01		CO 3, L3	
2.4	Representation of Discrete Structures	T1	138	156	Black board	01		CO 3, L3	
2.5	Discrete Structures concept and Types	T1	156	160	Black board	02		CO 3, L3	
2.6	Relations	T1,R4	160	177	Black board	02		CO 3, L3	
2.7	Relations and Their Properties	T1	573	583	Black board	01		CO 3, L3	
2.8	Relations and Their Applications	T1	583	591	Black board	01		CO 3, L3	
2.9	Representing Relations	T1	591	597	Black board	01		CO 3, L3	
2.10	Relations and Ordering	T1	597	607	Black board	02		CO 3, L3	
2.11	Function	T1	607	618	Black board	02		CO 3, L3	
2.12	Functions Types	T1	618	633	Black board	02		CO 3, L3	
2.13	Revision on 2 nd unit	T1	115-177	573-633	Black board	01		CO 3, L3	
	Review	Signature of the HOD/Coordinator							
UNIT- III									
III	Algebraic Structures					13			
3.1	Algebraic Structures : Introduction	R4	191	204	Black board	02		CO4, L6	
3.2	Algebraic Brief Explanation	T1, R3	204	218	Black board	01		CO4, L6	
3.3	Algebraic Systems	T1	218	232	Black board	01		CO4, L6	



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3.4	Induction Semi groups and Monodis	T1, T3, R3	311	333	Power point Presentation	02		CO4, L6
3.5	Lattices As Partially Ordered Sets	T1	333	344	Black board	02		CO4, L6
3.6	Explain about sets	T1	344	360	Black board	01		CO4, L6
3.7	Boolean Algebra	T1	360	372	Black board	02		CO4, L6
3.8	Boolean types	T1	372	377	Black board	01		
3.9	Revision on 3 rd unit	T1	191-232	311- 377	Black board	01		
	Review	Signature of the HOD/Coordinator						



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UNIT-IV

IV	Introduction Elementary Combinatorics								
						15			
4.1	Elementary Combinatorics	T1	445	445	Black board	02		CO5, L6	
4.2	An Introduction to Es	T1	445	452	Black board	01		CO5, L6	
4.3	Basic of counting	T1	452	468	Black board	01		CO5, L6	
4.4	Combinations and Permutations	T1	468	477	Black board	01		CO5, L6	
4.5	Enumeration of Combinations And Permutations	T1	477	494	Power point Presentation	01		CO5, L6	
4.7	Repetitions	T1	501	514	Black board	01		CO5, L6	
4.8	Enumerating Permutation	T1	514	517	Black board	02		CO5, L6	
4.9	Constrained Repetitions	T1	517	527	Black board	01		CO5, L6	
4.10	Binomial Coefficient	T1	527	537	Black board	01		CO5, L6	
4.11	Multinomial Theorems	T1	537	552	Black board	02		CO5, L6	
4.12	The Principle of Inclusion-Exclusion	T1	552	558	Black board	01		CO5, L6	
4.13	Revision on 4 th unit	T1	445	565	Black board	01		CO5, L6	
	Review	Signature of the HOD/Coordinator							

UNIT-V

V	Graphs							
						15		
5.1	Graphs and Graph Models	T1	641	651	Black board	01		CO6, L6
5.2	Graph Terminology and Special Types of Graphs	T1	651	668	Power point Presentation	01		CO6, L6



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5.3	Representing Graphs and Graph Isomorphism	T1	668	678	Power point Presentation	01		CO6, L6	
5.4	Connectivity	T1	678	693	Black board	01		CO6, L6	
5.5	Euler and Hamilton Paths	T1	693	707	Black board	01		CO6, L6	
5.6	Shortest-Path Problems	T1	707	718	Black board	01		CO6, L6	
5.7	Planar Graphs,	T1	718	727	Black board	01		CO6, L6	
5.8	Graph Coloring	T1	727	735	Black board	01		CO6, L6	
5.9	Trees: Introduction to Trees, Applications of Trees	T1	745	772	Black board	02		CO6, L6	
5.10	Tree Traversal	T1	772	785	Black board	01		CO6, L6	
5.11	Spanning Trees	T1	785	797	Black board	01		CO6, L6	
5.12	Minimum Spanning Trees	T1	797	803	Black board	02		CO6, L6	
5.13	Revision on 5 th unit	T1	641	803	Black board	01		CO6, L6	
	Review	Signature of the HOD/Coordinator							

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LIST OF TEXT BOOKS AND REFERENCES

TEXT BOOKS:

	BOOK TITLE with Author & Edition
TB1	Discrete Mathematics and its Applications with Combinatorics and Graph Theory- Kenneth H. Rosen, 7 th Edition, TMH.

REFERENCE BOOKS:

	BOOK TITLE with Author & Edition
TB1	Discrete Mathematical Structures with Applications to Computer Science-J.P. Tremblay and R. Manohar, TMH,
TB2	Discrete Mathematics for Computer Scientists & Mathematicians: Joe L. Mott, Abraham Kandel, Theodore P. Baker, 2 nd ed, Pearson Education.
TB3	Discrete Mathematics- Richard Johnsonbaugh, 7 th Edn., Pearson Education.
TB4	Discrete Mathematics with Graph Theory- Edgar G. Goodaire, Michael M. Parmenter.
TB5	Discrete and Combinatorial Mathematics - an applied introduction: Ralph.P. Grimald, 5 th edition, Pearson Education.

WEB LINKS

- W1. <https://www.cs.sfu.ca/~ggbaker/zju/math/proof.html>
- W2. https://gcallah.github.io/DiscreteMathematics/app_proplogic.html
- W3. https://www.tutorialspoint.com/discrete_mathematics/discrete_mathematics_sets.htm
- W4. <https://cse.buffalo.edu/~rapaport/191/seqsum.html>
- W5. <https://www.geeksforgeeks.org/discrete-mathematics-representing-relations/?ref=rp>
- W6. <https://www.geeksforgeeks.org/mathematics-closure-relations-equivalence-relations/>
- W7. <https://www.cs.odu.edu/~toida/nerzic/content/relation/order/order.html>
- W8. <https://faculty.uml.edu/klevasseur/ads/s-matrices-of-relations.html>
- W9. <https://www.geeksforgeeks.org/introduction-to-algorithms/>
- W10. https://www.cs.odu.edu/~toida/nerzic/content/recursive_alg/rec_alg.html
- W11. <https://study.com/academy/lesson/recursive-functions-definition-examples.html>
- W12. <https://users.encs.concordia.ca/~chvatal/notes/pc.html>



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QUESTION BANK
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ASSIGNMENT

S.No.	Assignment Questions	Course Outcome	Books To be Referred	Date Of Announcement	Date Of Submission
1.	a. Construct the truth table for the compound proposition $(p \rightarrow q) \leftrightarrow (\neg p \rightarrow \neg q)$. b. Construct the truth table for the compound proposition $(p \rightarrow q) \rightarrow (q \rightarrow p)$.	CO1	T1,		
2.	a. Show that $(\neg r) \wedge (q \rightarrow r) \rightarrow (p \vee q) \rightarrow r$ are logically equivalent. b. Show that the propositions $\neg q$ and $\neg p \vee q$ are logically equivalent.	CO1, CO4	T1,		
3.	a. Show that $(p \rightarrow (q \rightarrow r)) \rightarrow ((p \rightarrow q) \rightarrow (p \rightarrow r))$ is a tautology b. Is $\neg p \wedge (p \vee q) \rightarrow q$ a tautology?	CO4	T1		
4.	a. What are the negations of the statements $\forall x (x^2 > x)$ and $\exists x (x^2 = 2)$? b. Write the negation of the statement $(\exists x)(\forall y)P(x,y)$.	CO4	T1		
5.	.Let $A = \{1, 2, 3, 4, 5, 6, 12\}$. On A, define the relation R by aRb if and only if a divides b, prove that R is a partial order on A. Draw the Hasse diagram for this relation	CO2	T1		
6.	Let $A = \{1, 2, 3, 4\}$ and let R be the relation on A defined by xRy if and only if "x divides y", written $X y$. i) Write down R as a set of ordered pairs. ii) Draw the diagraph of R. iii) determine in-degree and out-degrees of the each vertex.	CO4	T2, R4		



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7.	1. Let $a=\{1, 2, 3\}$ and $b= \{2, 4, 5\}$. Determine the following: i) $ A \times B $ ii) Number of relations from A to B iii) Number of binary relations on A. (applying)	CO5	T1, R4		
8.	2. Let $A= \{1, 2, 3, 4\}$. Determine the nature of the following relations on A. $R1 = \{ (1, 1), (1, 2), (2, 1), (2, 2), (3, 3), (3, 4), (4, 3), (4, 4) \}$ $R2 = \{ (1, 2), (1, 3), (3, 1), (1, 1), (3, 3), (3, 2), (1, 4), (4, 2), (3, 4) \}$, $R3$ represented by the graph: (analyzing) <div style="text-align: center; margin-top: 10px;"> <pre> graph TD a((a)) --> b((b)) a((a)) --> c((c)) a((a)) --> d((d)) b((b)) --> c((c)) c((c)) --> d((d)) </pre> </div>	CO6	T1		
9.	Use mathematical induction to show that $1 + 2 + 22 + \dots + 2n = 2n+1 - 1$ for all nonnegative integers n.	CO5	T1		
10.	Conjecture a formula for the sum of the first n positive odd integers. Then prove your conjecture using mathematical induction.	CO6	T1		

SELF STUDY TOPICS

S.No.	Topics	Books & Journals	Course Outcomes
1	Discrete Probability and Advanced Counting Technique	Discrete Mathematics for Computer Scientists & Mathematicians: Joe L. Mott, Abraham Kandel, Teodore P. Baker, 2 nd ed, Pearson Education.	CO2
2	Graphs and Trees	Discrete Mathematics- Richard Johnsonbaugh, 7 th Edn., Pearson Education.	CO4



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UNIT I-MATHEMATICAL LOGIC :Statements and Notation, Connectives, Normal Forms, Theory of Inference for the Statement Calculus, The Predicate Calculus, Inference Theory of the Predicate Calculus.

	MultiplechoiceQuestions	BTLevel	Course Outcome
1C-1	Which of the following statement is a proposition? () a) Get me a glass of milkshake b) God bless you! c) What is the time now? d) The only odd prime number is 2	1	CO1
1C-2	Which of the following bits is the negation of the bits "010110"? () a) 111001 b) 001001 c) 101001 d) 111111	1	CO1
1C-3	If $P \rightarrow q$ is logically equivalent to () a) $\neg p \vee \neg q$ b) $p \vee \neg q$ c) $\neg p \vee q$ d) $\neg p \wedge q$	2	CO1
1C-4	The statement, "At least one of your friends is perfect". Let $P(x)$ be "x is perfect" and let $F(x)$ be "x is your friend" and let the domain be all people. () a) $\forall x (F(x) \rightarrow P(x))$ b) $\forall x (F(x) \wedge P(x))$ c) $\exists x (F(x) \wedge P(x))$ d) $\exists x (F(x) \rightarrow P(x))$	2	CO1
1C-5	$p \leftrightarrow q$ is logically equivalent to () a) $(p \rightarrow q) \rightarrow (q \rightarrow p)$ b) $(p \rightarrow q) \vee (q \rightarrow p)$ c) $(p \rightarrow q) \vee (q \rightarrow p)$ d) $(p \wedge q) \rightarrow (q \wedge p)$	2	CO1



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1C-6	<p>“The product of two negative real numbers is not negative.” Is given by? ()</p> <p>a) $\exists x \forall y((x < 0) \wedge (y < 0) \rightarrow (x y > 0))$ b) $\exists x \exists y ((x < 0) \wedge (y < 0) \wedge (x y > 0))$ c) $\forall x \exists y((x < 0) \wedge (y < 0) \wedge (x y > 0))$ d) $\forall x \forall y ((x < 0) \wedge (y < 0) \rightarrow (x y > 0))$</p>	2	CO1
1C-7	<p>Which of the following is correct with respect to precedence of logical operators ()?</p> <p>a) $\leftrightarrow, \rightarrow, \wedge, \vee, \sim$ b) $\vee, \wedge, \leftrightarrow, \rightarrow, \sim$ c) $\sim, \wedge, \vee, \rightarrow, \leftrightarrow$ d) $\rightarrow, \wedge, \sim, \leftrightarrow, \vee$</p>	5	CO1
1C-8	<p>A compound proposition that is always tautology ()</p> <p>a) True b) False c) Both d) None</p>	2	CO1
1C-9	<p>$p \wedge q$ is logically equivalent to ()</p> <p>a) $(p \rightarrow \neg q)$ b) $(\neg p \rightarrow \neg q)$ c) $\neg(p \rightarrow \neg q)$ d) $(\neg p \rightarrow q)$</p>	2	CO1
1C-10	<p>Let $P(x)$ denote the statement “$x > 7$.” Which of these have truth value true? ()</p> <p>a) $P(0)$ b) $P(4)$ c) $P(6)$ d) $P(9)$</p>	3	CO1
1C-11	<p>The compound propositions p and q are called logically equivalent then it is a tautology ()</p> <p>a) $p \leftrightarrow q$ b) $p \rightarrow q$ c) $\neg(p \vee q)$ d) $\neg p \vee \neg q$</p>	2	CO1
1C-12	<p>State rule of inference</p> <p>$\sim q$ $p \rightarrow q$</p>	1	CO1



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1M -4	Match the following		2	CO1
	a) Modusponens () i) $[\sim p \wedge (p \rightarrow q)] \rightarrow \sim p$			
	b) Modustollens () ii) $(p \wedge q) \rightarrow p$			
	c) Disjunctivesyllogism () iii) $[p \wedge (p \rightarrow q)] \rightarrow q$			
	d) Simplification () iv) $[(p \rightarrow q) \wedge (q \rightarrow r)] \rightarrow (p \rightarrow r)$			
	e) Hypotheticalsyllogism () v) $[(p \vee q) \wedge \sim q] \rightarrow q$			
1M -5	Match the following		1	CO1

1M.1	a) Rule-p ()	i) <u>P(t)forall t</u> $\forall (x)[p(x)]$	1	
1M.2	b) Rule-ES ()	ii) $R \rightarrow S$	2	
1M.3	c) Rule-US ()	iii) Introduce a tany step in Derivation	2	
1M.4	d) Rule-CP ()	iv) <u>$\exists (x)[p(x)]$</u> p(t)for some t	3	
1M.5	e) Rule-UG ()	v) <u>$\forall (x)[p(x)]$</u> <u>P(t)for all t</u>	1	

UNIT I-MATHEMATICAL LOGIC : Statements and Notation, Connectives, Normal Forms, Theory of Inference for the Statement Calculus, The Predicate Calculus, Inference Theory of the Predicate Calculus.

PART-A

Q No	Question	Bloom's Taxonomy Level	Course Outcomes
1.	Construct the truth table for the compound proposition $(p \rightarrow q) \leftrightarrow (\sim p \rightarrow \sim q)$. (remembering)	1	CO1, CO6
2.	Construct the truth table for the compound proposition $(p \rightarrow q) \rightarrow (q \rightarrow p)$. (understanding)	2	CO1, CO6
3.	What are the contra positive, the converse and the inverse of the conditional statement "If you work hard then you will be rewarded". (understanding)	2	CO1, CO6
4.	Find the truth table for the statement $p \rightarrow \sim q$. (remembering)	1	CO1, CO6
6.	Write the symbolic representation and give its contra positive statement of "If it rains today, then I buy an umbrella". (understanding)	2	CO1, CO6
7.	When do you say that two compound propositions are equivalent ? (remembering)	1	CO1, CO6
8.	Show that $(\sim r) \wedge (q \rightarrow r), (p \vee q) \rightarrow r$ are logically equivalent. (remembering)	1	CO1, CO6
9.	Give an indirect proof of the theorem "If $3n+2$ is odd, then n is odd." (creating)	6	CO1, CO6
10.	Prove that $p, p \rightarrow q, q \rightarrow r \Rightarrow r$ (Applying)	3	CO1, CO6

PART-B



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1.(a)	<i>prove that $[(p \vee q) \wedge \sim (\sim p \wedge (\sim q \vee \sim r))] \vee (\sim p \wedge \sim q) \vee (\sim p \wedge \sim r)$</i> <i>is a tautology</i>	2	CO1
1. (b)	<i>show that $(p \rightarrow q), (r \rightarrow s), (q \rightarrow t), (s \rightarrow u), \sim (t \wedge u), (p \rightarrow r) \Rightarrow \sim p$</i>	2	CO1
2(a)	Define Tautology. Draw the truth table for tautology.	2	CO1,CO6
2(b)	State the Laws of Logic.	2	CO1,CO6
3. (a)	Find the DNF of the following $\mathbf{p \rightarrow \{ (p \rightarrow q) \wedge \sim (\sim q \vee \sim p) \}}$	6	CO1,CO6
3.(b)	Find CNF of the following $\mathbf{[\sim(p \vee q) \leftrightarrow (p \wedge q)]}$	2	CO1,CO6
4.(a)	Show that $(\sim P \wedge (\sim Q \wedge R)) \vee (Q \wedge R) \vee (P \wedge R) \Leftrightarrow R$ without using truth table. (remembering)	1	CO1,CO6
4.(b)	Show that $\forall x P(x) \wedge \exists x Q(x)$ is equivalent to $\forall x \exists y (P(x) \wedge Q(y))$ (remembering)	1	CO1,CO6
5.	<i>State the converse, inverse and contrapositive of the following conditional:</i> (1) <i>if a quadrilateral is a parallelogram, then its diagonals bisect each other</i> (2) <i>if a real number x^2 is greater than zero, then x is not equal to zero</i> (3) <i>if a triangle is not isosceles, then it is not equilateral.</i>	2	CO1,CO6
6. (a)	Prove the argument is valid $\forall x, [P(x) \rightarrow \{q(x) \wedge r(x)\}]$ $\forall x, [P(x) \wedge s(x)]$ <hr style="width: 20%; margin: 0 auto;"/> $\therefore \forall x, [r(x) \wedge s(x)]$ (creating)	5	CO1,CO6
6.(b)	Prove that $(P \rightarrow Q) \wedge (R \rightarrow Q) \Leftrightarrow (P \vee R) \rightarrow Q$ (creating)	6	CO1,CO6
7	<i>consider the following propositions concerned with a certain triangle ABC</i> <i>p: ABC is isosceles. q: ABC is equilateral. r: ABC is equiangular.</i> <i>write down the following compound propositions in words.</i> (1) $p \wedge (\sim q)$ (2) $(\sim p) \vee q$ (3) $p \rightarrow q$ (4) $q \rightarrow p$ (5) $(\sim r) \rightarrow (\sim q)$	1	CO1,CO6
8.(a)	Prove that the premises $p \vee q, (p \vee q) \rightarrow r, \sim r$ are inconsistent. (creating)	6	CO1,CO6
8.(b)	Without using truth table find PCNF and PDNF of $[P \rightarrow (Q \wedge R)] \wedge [\sim P \rightarrow (\sim Q \wedge \sim R)]$. (Applying)	3	CO1,CO6
9.(a)	<i>show that p from these premises $(\sim p \vee q) \rightarrow r, r \rightarrow (s \vee t), (\sim s \wedge \sim u), (\sim u \rightarrow \sim t)$</i> (remembering)	1	CO1,CO6
9.(b)	Show that the premises “One student in this class knows how to write program in JAVA”, and “Everyone who knows how to write the program in JAVA can get a high paying job imply a conclusion “someone in this class can get a high paying job”. (remembering)	1	CO1,CO6
10.(a)	Show that $(\sim P \rightarrow R) \wedge (Q \leftrightarrow P) \Leftrightarrow (P \vee Q \vee R) \wedge (P \vee \sim Q \vee R) \wedge (P \vee \sim Q \vee \sim R) \wedge (\sim P \vee Q \vee R) \wedge (\sim P \vee Q \vee \sim R)$. (remembering)	1	CO1,CO6



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2C-15	<p>According to the symmetric matrix, which of the following statement is correct?</p> <p style="text-align: right;">()</p> <p>a) $A = A^T$ b) All the diagonal elements of a symmetric matrix are One.</p> <p>c) $A = -A^T$ d) All the diagonal elements of a symmetric matrix are Zero</p>	2	CO2
Fill in the blanks			
2F-1	{x: $x \in \mathbb{N}$ and x is prime} then it is _____	1	CO2
2F-2	Two sets are called disjoint if there _____ is the empty set.	2	CO2
2F-3	Power set of empty set has exactly _____ subset	2	CO2
2F-4	The relation between sets A, B, C as shown by Venn diagram is _____	1	CO2
2F-5	Let the sets be A, B, C, D then $(A \cap B) \times (C \cap D)$ is equivalent to _____	1	CO2
2F-6	The set containing all the collection of subsets is known as _____	2	CO2
2F-7	A function is said to be _____ if and only if $f(a) = f(b)$ implies that $a = b$ for all a and b in the domain of f.	1	
2F-8	For an inverse to exist it is necessary that a function should be _____	3	
2F-9	Consider the relation: $R'(x, y)$ if and only if $x, y > 0$ over the set of non-zero rational numbers, then R' is _____	2	CO2
2F-10	Let set $A = \{1, 2\}$ and $B = \{3, 4\}$ then $A \times B$ (Cartesian product of set A and B) is _____	1	CO2
2F-11	If a set contains 3 elements then the number of subsets is _____	2	CO2
2F-12	If $f(x) = y$ then $f^{-1}(y)$ is equal to _____	4	CO2
2F-13	The inverse of function $f(x) = x^3 + 2$ is _____	1	CO2
2F-14	If $n(A) = 20$ and $n(B) = 30$ and $n(A \cup B) = 40$ then $n(A \cap B)$ is _____	5	CO2

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	5) bijective ()	d) one-one & Onto	e) A image in B	2

UNIT II - SET THEORY: Basic Concepts of Set Theory, Representation of Discrete Structures, Relations and Ordering, Functions.				
PART-A				
1.	What is Binary Relation?	(understanding)	2	CO2
2.	Define Equivalence Relation?	(remembering)	1	CO2
3.	Define Compatibility Relation?	(remembering)	1	CO2
4.	Write Partial Ordering Relation with example.	(evaluating)	5	CO2
5.	Define Function and types of Function	(remembering)	1	CO2
6.	Define Inverse Function	(remembering)	1	CO2
7.	Define set, subset, proper subset	(remembering)	5	CO2
8.	What is Unary, Binary, N-ary Structures ?	(understanding)	2	CO2
9.	Define Symmetric, Asymmetric, Anti Symmetric Relation.	(remembering)	1	CO2
10.	What is Cartesian Product of a set?	(understanding)	2	CO2
PART-B				
1	Let $A = \{1, 2, 3, 4, 5, 6, 12, 24, 27, 30\}$. On A, define the relation R by aRb if and only if a divides b, prove that R is a partial order on A. Draw the Hasse diagram for this relation. (creating)		6	CO2
2.	Explain the properties of Equivalence relation with example. (understanding)		2	CO2
3.	Define and explain Hasse diagram pictorially with an example. (remembering)		1	CO2
4.	Explain Compatibility relation with example. (understanding)		2	CO2
5.	Explain the properties of Partial ordering relation and give two examples. (understanding)		2	CO2
6.	Let $A = \{1, 2, 3, 4\}$ and let R be the relation on A defined by xRy if and only if "x divides y", written $X y$. i) Write down R as a set of ordered pairs. ii) Draw the diagraph of R. iii) Determine in-degree and out-degrees of the each vertex. (creating)		6	CO2
7	Consider the following relations on the set $A = \{1, 2, 3\}$ $R_1 = \{(1, 1), (1, 2), (1, 3), (3, 3)\}$ $R_2 = \{(1, 1), (1, 2), (2, 1), (2, 2), (3, 3)\}$ and $R_3 = \{(1, 1), (1, 2), (2, 2), (2, 3)\}$. Which of these are i) reflexive, ii) symmetric, iii) transitive, iv) anti symmetric? (remembering)		1	CO2
8	Let $A = \{1, 2, 3, 4\}$, and $R = \{(1, 1), (1, 2), (2, 1), (2, 2), (3, 1), (3, 3), (1, 3), (4, 1), (4, 4)\}$ be a relation on A. Is R an equivalence relation? (analyzing)		4	CO2



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3F.6	A cyclic group is always _____	4	CO3	
3F.7	How many properties can be held by a group _____	2	CO3	
3F.8	_____ and _____ are the two binary operations defined for lattices.	2	CO3	
3F.9	A _____ value is represented by a Boolean expression	2	CO3	
3F.10	$F(X, Y, Z, M) = X'Y'Z'M'$. The degree of the function is _____	1	CO3	
3F.11	The _____ of all the variables in direct or complemented form is a maxterm.	1	CO3	
3F.12	The logic gate that provides high output for same inputs _____	11	CO3	
3F.13	If $x \in \mathbb{N}$ and x is prime, then x is _____ set.	1	CO3	
3F.14	If x is a set and the set contains the real number between 1 and 2, then the set is _____.	2	CO3	
3F.15	Power set of empty or Null set has exactly _____ subset.	1	CO3	
3F.16	The difference of $\{1, 2, 3, 6, 8\}$ and $\{1, 2, 5, 6\}$ is the set _____	1	CO3	
3F.17	The function (gof) is _____, if the function f and g are onto function?	2	CO3	
3F.18	The cardinality of the set of even positive integers less than 20 is _____?	2	CO3	
3F.19	Universal logic gate is _____.	1	CO3	



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3F.20	The sum of two symmetric matrices is also a symmetric matrix. _____.	1	CO3
3F.21	The vertices in the Hasse diagram are denoted by . _____ . rather than by. _____ .	2	CO3
Objective Questions		BT Level	Course Outcome
3C-1	. A non empty set A is termed as an algebraic structure _____ a) with respect to binary operation * b) with respect to ternary operation ? c) with respect to binary operation + d) with respect to unary operation –	III	CO3
3C-2	An algebraic structure _____ is called a semigroup. a) (P, *) b) (Q, +, *) c) (P, +) d) (+, *)	I	CO3
3C-3	Condition for monoid is _____ a) (a+e)=a b) (a*e)=(a+e) c) a=(a*(a+e) d) (a*e)=(e*a)=a	I	CO3
3C-4	Matrix multiplication is a/an _____ property. a) Commutative b) Associative c) Additive d) Disjunctive	I	CO3
3C-5	A cyclic group can be generated by a/an _____ element. a) singular b) non-singular c) inverse d) multiplicative	II	CO3
3C-6	A cyclic group is always _____ a) abelian group b) monoid c) semigroup d) subgroup	I	CO3
3C-7	If every two elements of a poset are comparable then the poset is called _____ a) sub ordered poset	II	CO3



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	b) totally ordered poset c) sub lattice d) semigroup		
3C-8	A free semi lattice has the _____ property. a) intersection b) commutative and associative c) identity d) universal	II	CO3
3C-9	Algebra of logic is termed as _____ a) Numerical logic b) Boolean algebra c) Arithmetic logic d) Boolean number	I	CO3
3C-10	Which of the following is/are the universal logic gates? a) OR and NOR b) AND c) NAND and NOR d) NOT	II	CO3
3C-11	Which of the following is a Simplification law? a) $M.(\sim M+N) = M.N$ b) $M+(N.O) = (M+N)(M+O)$ c) $\sim(M+N) = \sim M.\sim N$ d) $M.(N.O) = (M.N).O$	II	CO3
3C-12	Which of the following is a subset of set $\{1, 2, 3, 4\}$? a) $\{1, 2\}$ b) $\{1, 2, 3\}$ c) $\{1\}$ d) All of the mentioned	I	CO3
3C-13	What is the Cartesian product of set A and set B, if the set $A = \{1, 2\}$ and set $B = \{a, b\}$? () a. $\{(1, a), (1, b), (2, a), (b, b)\}$ b. $\{(1, 1), (2, 2), (a, a), (b, b)\}$ c. $\{(1, a), (2, a), (1, b), (2, b)\}$	III	CO3



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	d. $\{(1, 1), (a, a), (2, a), (1, b)\}$		
3C-14	If $n(A) = 20$ and $n(B) = 30$ and $n(A \cup B) = 40$ then $n(A \cap B)$ is? () a. 20 b. 30 c. 40 d. 10	II	CO3
3C-15	Euler's integral of the first kind, which is a proper integral, is used to define the gamma function. () a) True b) False	I	CO3
	MATCH THE FOLLOWING	BT Level	Course Outcome
3M-1	a) Least upper bound () a) 4 b) properties of lattices () b) " a" joint "b" c) $(a \wedge b)'$ () c) $a * a = a$ d) Idempotent structure () d) Algebraic e) $\langle S, *1, *2, \dots, *k \rangle$ () e) a, vb'	II	CO3
3M-2	a) A cyclic group is always () a) associative property b) . Matrix multiplication is () b) abelian group c) A monoid is called a group () c) For designing of the digital computers d) Boolean algebra can be used () d) Arithmetic logic e) Algebra of logic is termed as () e) $(a * c) = (c * a) = e$	II	CO3
3M-3	A) Meet semi lattice () A) $A * B = A * C \Rightarrow B = C$ B) Join semi lattice () B) LUB C) Cancellation property () C) GLB D) POSET () D) partially ordered set	I	CO3
3M-4	A) LUB () a) OR B) GLB () b) AND C) POS () c) SUM OF PRODUCT D) SOP () d) SUM OF PRODUCT	I	CO3
3M-5	a) Commutative law () A) $(a * b)' = a' + b'$ b) Distributive law () B) $a * a' = 0$ c) Identity law () C) $a * 1 = a$ d) Complement law () D) $a * (b + c) = (a * b) + (a * c)$	I	CO3



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e) Demorgan law () E)a+b=b+a

UNIT-III- ALGEBRAIC STRUCTURES: introduction, Algebraic Systems, Semi groups and Monoids, Lattices as Partially Ordered Sets, Boolean Algebra.

PART-A

1.	what is binary operation?		CO3
2.	what is $n - \text{ary operation}$?		CO3
3	define semigroup and abelian semigroup?		CO3
4	what is Monoid?		CO3
5	define Commutative Ring		CO3
6	Define Lattice and Sub Lattice. (evaluating)		CO3
7	Define Total order.		CO3
8	Define Group.		CO3
9	Define Integral domain.		CO3
10	Define Commutative Ring.		CO3
11	Define Algebraic system with examples. (understanding)		CO3

PART-B

1. Consider the set $A = \{1,2,3,4,5,6,7,8\}$ and a partial order on A whose Hasse diagram is as shown below. Consider the subsets $B_1 = \{1,2\}$ and $B_2 = \{3,4,5\}$ of A as shown in the figure below.

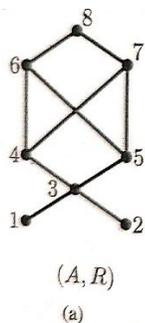


Fig 1

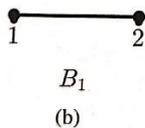


Fig 2

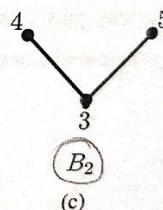


Fig 3

2	On the set $A = \{a,b,c,d\}$, a binary operation $*$ defined as described in the following table:		CO3
---	--	--	-----



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*	a	b	c	d
a	a	c	b	d
b	c	b	d	a
c	b	d	a	c
d	d	a	c	b

Is * commutative? Associative?

3.	On the set Q of all rational numbers, the operation * is defined by $a*b = a + b - ab$. Show that, under this operation, Q forms a commutative monoid.	CO3																											
4	<p>In each of the following cases a binary operation * on set $A = \{a, b\}$ is defined through a multiplication table. Determine whether $\langle A, * \rangle$ is a semigroup or a Monoid or neither.</p> <p>1) <table style="display: inline-table; border-collapse: collapse; margin-right: 20px;"> <tr><td style="padding: 0 5px;">*</td><td style="border-left: 1px solid black; padding: 0 5px;">a</td><td style="padding: 0 5px;">b</td></tr> <tr><td style="padding: 0 5px;">a</td><td style="border-left: 1px solid black; padding: 0 5px;">b</td><td style="padding: 0 5px;">a</td></tr> <tr><td style="padding: 0 5px;">b</td><td style="border-left: 1px solid black; padding: 0 5px;">a</td><td style="padding: 0 5px;">b</td></tr> </table> 2) <table style="display: inline-table; border-collapse: collapse; margin-right: 20px;"> <tr><td style="padding: 0 5px;">*</td><td style="border-left: 1px solid black; padding: 0 5px;">a</td><td style="padding: 0 5px;">b</td></tr> <tr><td style="padding: 0 5px;">a</td><td style="border-left: 1px solid black; padding: 0 5px;">a</td><td style="padding: 0 5px;">a</td></tr> <tr><td style="padding: 0 5px;">b</td><td style="border-left: 1px solid black; padding: 0 5px;">b</td><td style="padding: 0 5px;">b</td></tr> </table> 3) <table style="display: inline-table; border-collapse: collapse;"> <tr><td style="padding: 0 5px;">*</td><td style="border-left: 1px solid black; padding: 0 5px;">a</td><td style="padding: 0 5px;">b</td></tr> <tr><td style="padding: 0 5px;">a</td><td style="border-left: 1px solid black; padding: 0 5px;">a</td><td style="padding: 0 5px;">b</td></tr> <tr><td style="padding: 0 5px;">b</td><td style="border-left: 1px solid black; padding: 0 5px;">a</td><td style="padding: 0 5px;">a</td></tr> </table> </p>	*	a	b	a	b	a	b	a	b	*	a	b	a	a	a	b	b	b	*	a	b	a	a	b	b	a	a	CO3
*	a	b																											
a	b	a																											
b	a	b																											
*	a	b																											
a	a	a																											
b	b	b																											
*	a	b																											
a	a	b																											
b	a	a																											
5.	If N denotes the set of all natural numbers, and + and \times are the usual addition and multiplication operations, show that $\langle N, +, \times \rangle$ is not a ring.	CO3																											
6	Explain Some Standard Algebraic Structures with example.	CO3																											
7.	What is binary operation and write the properties of binary operations?	CO3																											
8.a	Define group and abelian group	CO3																											
8.b	Let G be the set of all non-zero real numbers and let $a * b = \frac{1}{2} ab$. show $\langle G, * \rangle$ is abelian group.	CO3																											
9.	Write the properties of Lattices and explain special types of Lattices with example.	CO3																											

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UNIT-IV: Elementary combinatorics: Basics of Counting, Combinations and permutations, Enumeration of Combinations and Permutations, Enumerating Combinations and Permutations with Repetitions, Enumerating Permutation with Constrained Repetitions, Binomial Coefficient, The Binomial and Multinomial Theorems, The Principle of Exclusion.

	Objective Questions	BT Level	Course Outcome
4C-1	Let H and T denotes head and tail side of an unbiased coin. Ankit tossed this coin three times and wants at least two heads. How many such outcomes are possible? a) 2 b) 3 c) 4 d) 5	III	CO4
4C-2	Determine the coefficient of the x^5y^7 term in the polynomial expansion of $(m+n)^{12}$. a) 792 b) 439 c) 382 d) 630	III	CO4
4C-3	In how many ways 5 students can be arranged to sit in an examination center with 9 seats? a) $9P5$ b) $5C5$ c) $5!$ d) $5P4$	I	CO4
4C-4	A basket contains 5 oranges 8 apples and 7 guavas, in how many ways can 3 fruits be chosen such that all the fruits are of different families? a) 240 b) 20 c) 280 d) 28	III	CO4
4C-5	In how many ways the word can 'CHAMPION' be arranged such that the letter 'P' always comes to the left of 'H'? a) 5040 b) 40320 c) 10080 d) 20160	III	CO4
4C-6	In how many ways 6 boys and 11 girls can be seated at a round table if two boys are not allowed to sit together?	III	C



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	<p>a) 11P6</p> <p>b) 11!</p> <p>c) 11!\times11P6</p> <p>d) 10!\times11P6</p>		O 4
4C-7	<p>In the Deep Learning examination, you are given 30 questions divided into two parts, Section A and Section B. Each part consists of 15 questions. You are asked to answer any 15 questions in total but it is mandatory to answer at least 6 questions from each section. In how many ways can the student select questions?</p> <p>a) $15C6 \times 15C9 + 15C7 \times 15C8 + 15C8 \times 15C7 + 15C9 \times 15C6$</p> <p>b) $15C8 \times 15C9 + 15C7 \times 15C8 + 15C9 \times 15C8$</p> <p>c) $15C7 \times 15C8 + 15C8 \times 15C7 + 15C9 \times 15C6$</p> <p>d) $15C5 \times 15C10 + 15C6 \times 15C9 + 15C7 \times 15C8 + 15C8 \times 15C7 + 15C9 \times 15C6 + 15C5 \times 15C10$</p>	II	CO 4
4C-8	<p>What is the coefficient of the 5th term in the expression $(6x^{41} - x^3)^5$?</p> <p>a) -720106920</p> <p>b) -525106920</p> <p>c) -72021384</p> <p>d) -52521384</p>	III	CO 4
4C-9	<p>. Who invented the concept of inclusion-exclusion principle?</p> <p>a) Abraham de Moivre</p> <p>b) Daniel Silva</p> <p>c) J.J. Sylvester</p> <p>d) Sieve</p>	III	CO 4
4C-10	<p>Using the inclusion-exclusion principle, find the number of integers from a set of 1-100 that are not divisible by 2, 3 and 5.</p> <p>a) 22</p> <p>b) 25</p> <p>c) 26</p> <p>d) 33</p>	II	CO 4
4C-11	<p>Using the inclusion-exclusion principle, find the number of integers from a set</p>	II	CO



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	of 1-100 that are not divisible by 2, 3 and 5. a) 22 b) 25 c) 26 d) 33		4
4C-12	. Determine the independent term of x^7 in the expansion of $(3x^2 + 4)^{12}$. a) $220 * 4^6$ b) 230 c) $548 * 3!$ d) $220 * 3^6 * 4^6$	I	CO 4
4C-13	How many 4-digit numbers can be formed by using 2, 4, 6, 8, 10, 12 without repetition of digits? a) 15 b) 42 c) 70 d) 127	II	CO 4
4C-14	Calculate the value of 8C_5 . a) 79 b) 43 c) 120 d) 56	I	CO 4
4C-15	Find the number of permutations of word DEPENDENT . a) 132400 b) 1512500 c) 1663200 d) 1723400	I	CO 4
	FILL IN THE BLANK QUESTIONS	BT Level	Course Outcome
4F-1	Determine n if ${}^{2n}C_3 : {}^nC_3 = 9:1$. _____	I	CO4
4F-2	If ${}^{14}C_r = 14$ and ${}^{15}C_r = 15$. Find the value of ${}^{14}C_{r-1}$. _____	II	CO4
4F-3	$10010! = 18! + x9!$. Find x. = _____	I	CO4
4F-4	If an event can occur in 'm' different ways, following which another event can occur in 'n' different ways, then the total numbers of occurrence of the events in the given order is _____	II	CO4
4F-5	The number of permutations of n different objects taken r at a time, where repetition is allowed is _____	II	CO4
4F-6	Find the number of 5 letter words that can be formed from word IMAGE using permutations if repetition is allowed. = _____	II	CO4
4F-7	Set which contains all possible outcomes is _____	I	CO4
4F-8	Which symbol denote impossible event? _____	II	CO4



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4F-9	If an event has only one sample point then it is called _____	I	CO4										
4F-10	If ${}^6C_2 = {}^6C_x$ then find possible values of x. _____	II	CO4										
4F-11	${}^nP_r = {}^nC_r * \underline{\hspace{2cm}}$	I	CO4										
4F-12	What are the coefficients of the first and the last term of $(a + b)^n$? = _____	II	CO4										
4F-13	What is the expansion of the series $(xy + 2)^2$? = _____	I	CO4										
4F-14	_____ is one of the most useful principles of enumeration in combinationatorics and discrete probability.	II	CO4										
4F-15	Who invented the concept of inclusion-exclusion principle? = _____	II	CO4										
MATCH THE FOLLOWING			CO4										
4M-1	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%;">a) nP_0 ()</td> <td style="width: 50%;">a) $n!(n-r)!$</td> </tr> <tr> <td>b) nP_n ()</td> <td>b) $n=6$</td> </tr> <tr> <td>c) nP_r ()</td> <td>c) $n!$</td> </tr> <tr> <td>d) $6!$ ()</td> <td>d) 1</td> </tr> <tr> <td>e) ${}^nP_3 = 4 * {}^nP_2$. ()</td> <td>e) 720</td> </tr> </table>	a) nP_0 ()	a) $n!(n-r)!$	b) nP_n ()	b) $n=6$	c) nP_r ()	c) $n!$	d) $6!$ ()	d) 1	e) ${}^nP_3 = 4 * {}^nP_2$. ()	e) 720	II	CO4
a) nP_0 ()	a) $n!(n-r)!$												
b) nP_n ()	b) $n=6$												
c) nP_r ()	c) $n!$												
d) $6!$ ()	d) 1												
e) ${}^nP_3 = 4 * {}^nP_2$. ()	e) 720												
4M-2	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%;">a) Bayes theorem ()</td> <td style="width: 50%;">a) $P(A B) = P(A \cap B) / P(B)$</td> </tr> <tr> <td>b) Conditional probability ()</td> <td>b) $P(A B) = [P(B A)P(A)] / P(B)$</td> </tr> <tr> <td>c) $(x+y)^n$ ()</td> <td>c) ${}^nC_0 x^n y^0 + {}^nC_1 x^{n-1} y^1 + \dots$</td> </tr> <tr> <td>d) modular lattice. ()</td> <td>d) $a^{b^c} = (a^b)^c$</td> </tr> </table>	a) Bayes theorem ()	a) $P(A B) = P(A \cap B) / P(B)$	b) Conditional probability ()	b) $P(A B) = [P(B A)P(A)] / P(B)$	c) $(x+y)^n$ ()	c) ${}^nC_0 x^n y^0 + {}^nC_1 x^{n-1} y^1 + \dots$	d) modular lattice. ()	d) $a^{b^c} = (a^b)^c$	III	CO4		
a) Bayes theorem ()	a) $P(A B) = P(A \cap B) / P(B)$												
b) Conditional probability ()	b) $P(A B) = [P(B A)P(A)] / P(B)$												
c) $(x+y)^n$ ()	c) ${}^nC_0 x^n y^0 + {}^nC_1 x^{n-1} y^1 + \dots$												
d) modular lattice. ()	d) $a^{b^c} = (a^b)^c$												
4M-3	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%;">a) distributive lattice ()</td> <td style="width: 50%;">a) $n!$</td> </tr> <tr> <td>b) $P(n,n-1)$ ()</td> <td>b) $x \wedge (y \vee z) = (x \wedge y) \vee (x \wedge z)$</td> </tr> <tr> <td>c) $2^5 * 3^6 * 5^2$ ()</td> <td>c) 56</td> </tr> <tr> <td>d) ${}^{18}C_r = {}^{18}C_{r+2}$, find rC_5. ()</td> <td>d) 24</td> </tr> </table>	a) distributive lattice ()	a) $n!$	b) $P(n,n-1)$ ()	b) $x \wedge (y \vee z) = (x \wedge y) \vee (x \wedge z)$	c) $2^5 * 3^6 * 5^2$ ()	c) 56	d) ${}^{18}C_r = {}^{18}C_{r+2}$, find rC_5 . ()	d) 24	II	CO4		
a) distributive lattice ()	a) $n!$												
b) $P(n,n-1)$ ()	b) $x \wedge (y \vee z) = (x \wedge y) \vee (x \wedge z)$												
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UNIT-IV: Elementary combinatorics: Basics of Counting, Combinations and permutations, Enumeration of Combinations and Permutations, Enumerating Combinations and Permutations with Repetitions, Enumerating Permutation with Constrained Repetitions, Binomial Coefficient, The Binomial and Multinomial Theorems, The Principle of Exclusion.

PART-A

1.	Mention the types of counting principles. (remembering)		CO4
2.	Define Permutations with an example. (understanding)		CO4
3.	What is the formula for restricted permutations? (remembering)		CO4
4.	Write the formula for principle of Inclusion-Exclusion for two sets. (understanding)		CO4
5.	Mention the formula for Binomial theorem. (remembering)		CO4
6.	Mention the formula for Multinomial theorem. (remembering)		CO4



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7.	Write about sum and product rule.		CO4
8	Define Combinations with an example. (understanding)		CO4
9	Mention the formula for Combinations with Repetitions?		CO4
10	Write the formula for Principle of disjunctive counting for two sets.		CO4

PART-B

1.	Give a formula for the number of elements in the union of four sets. (Remembering)	1	CO4
2.	What is the probability that a positive integer selected at random from the set of positive integers not exceeding 100 is divisible by either 2 or 5? (Remembering)	1	CO4
3.	How many positive integers not exceeding 1000 or divisible by 7 or 11? By using inclusion-exclusion . (understanding)	2	CO4
4.	Find the number of distinguishable permutation of the letters in the following words: (analyzing) (dsc-pno-369) i)DISCRETEMATHEMATICS ii)ENGINEERING iii)CALCULUS iv)STRUCTURES v)PASCAL		CO4
5.	1. In how many ways can 6 men and 6 women be seated in a row (applyin i) If any person may sit next to any other? ii) If men and women must occupy alternate seats?(dsc.pno-367)		CO4
6.	Determine the coefficient of (remembering) i) xyz^2 in the expansion of $(2x-y-z)^4$, and ii) $a^2b^3c^2d^5$ in the expansion of $(a+2b-3c+2d+5)^{16}$.(dsc.pno-383)		CO4
7.	2. A woman has 11 close relatives and she wishes to invite 5 of them to dinner . In how many ways can she invite them in following situations: (analyzing) (dsc.pno-374) i) There is no restriction on the choice. ii) Two particular persons will not attend separately. iii) Two particular persons will not attend together.		CO4
8.	3. There are five different roads from the city A to the city B, three different roads from the city B to the city C, and three different roads that go directly from A to C. (i) How many different ways are there from A to C altogether? (ii) How many different trips are there from A to C and back to A that visit B at least once? (applying) (kandel p.no:138)		CO4



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9.	Explain Binomial and Multinomial Theorems	2	CO4
10.	<p><i>A survey of 500 television viewers of a sports channel produced the following information: 285 watch cricket, 195 watch hockey, 115 watch football, 45 watch cricket and football, 70 watch cricket and hockey, 50 watch hockey and football and 50 do not watch any of the three kinds of games.</i></p> <p><i>(a) how many viewers in the survey watch all three kinds of games</i></p> <p><i>(b) how many viewers watch exactly one of the sports?</i></p>		CO4
		2	CO3

UNIT-V: Graph Theory: Basic Concepts, Isomorphism and Subgraphs, Trees and their Properties, Spanning Trees, Binary Trees, Planar Graphs, Euler's Formula, Multi-graphs and Euler Circuits, Hamiltonian Graphs, Chromatic Numbers, The Four-Color Problem.

PART-A

1.	1. Define a Graph.(understanding) 2. Define a Sub graph with examples. (understanding)	2	CO5
2.	What are the various types of graph? (remembering)	1	CO5
3.	Define a Bipartite and complete bipartite graph with one example.(applying)	3	CO5
4.	What is connected graph and disconnected graph? (analyzing)	4	CO5
5.	What is a Spanning tree? (remembering)	1	CO5
6.	a. Define a Sub graph with examples. (understanding) b. Define graph Isomorphism.(understanding)	1	CO5
7.	a. Define graph Isomorphism.(understanding) b. Distinguish between Euler path and Euler circuit? (evaluating)	5	CO5
8.	a. Define Hamiltonian cycle and Hamilton path.(understanding) b. How chromatic number help in map coloring?(applying)	2	CO5
9.	a. What is Graph coloring. b. Define Rooted tree.(understanding)	2	CO5
10.	What is Spanning trees. .(understanding)	2	CO5

PART-B

1.	<p>a) Explain about Kruskal's algorithm.(understanding)</p> <p>b) Find the minimal spanning tree by using Kruskal's algorithm for the following given graph. (creating)</p>	2	CO5
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2.	<p>a. Explain about Prim's algorithm. (applying) b. Find the minimal spanning tree by using prim's algorithm for the following given graph. (creating)</p>	3	CO5
3.	<p>What is a planar graph? Mention the properties of a planar graph. (analyzing)</p>	4	CO5
4.	<p>a) Explain DFS algorithm. (understanding) b) Apply a BFS algorithm to find a spanning tree. (applying)</p>		CO5
5.	<p>a) Draw a complete binary tree with 19 vertices. (creating) b) A complete binary tree has 25 leaves. How many vertices does it have? (creating)</p>	6	CO5
6.	<p>Show that the maximum number of edges in a complete bipartite graph with 'n' vertices is $n^2/4$. (creating).</p>		CO5
7.	<p>Find an Eulerian cycle in the graph. (creating)</p>	6	CO5



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8.	<p>a) Explain about Isomorphism. (understanding) b) Show that following graphs are Isomorphic or not. (creating)</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;"> </div> <div style="text-align: center;"> </div> </div> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;"> </div> <div style="text-align: center;"> </div> </div>	2	CO5
9.	<p>How many paths of length four are there from <i>a</i> to <i>d</i> in the simple graph <i>G</i> given below. (creating)</p> <div style="text-align: center;"> </div>	6	CO5
10.	<p>Draw the complete graph K_5 with vertices A, B, C, D, E. Draw all complete sub graph of K_5 with 4 vertices. (analyzing)</p>	4	CO5



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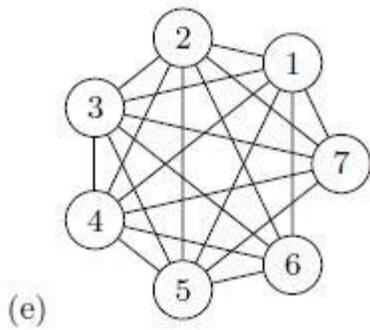
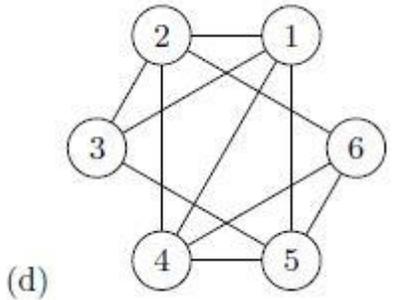
	Objective Questions	BT Level	Course Outcome
5C-1	<p>Which of the following graphs are not complete graphs?</p> <div style="display: flex; flex-direction: column; gap: 20px;"> <div style="text-align: center;"> <p>(a)</p> </div> <div style="text-align: center;"> <p>(b)</p> </div> <div style="text-align: center;"> <p>(c)</p> </div> </div>	III	CO5



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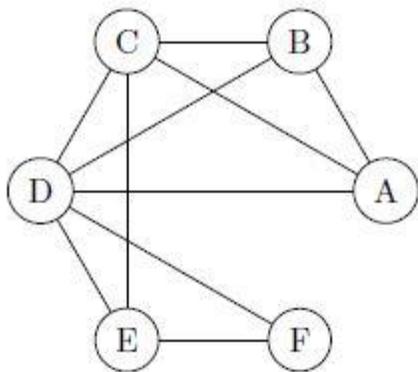
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Sub.Code&Title	R22CSE2111 & DISCRETE MATHEMATICS		
AcademicYear:2024-25	Year/Sem./Section	II/IT	
Faculty Name&Designation	S. VARSHA REDDY ASST PROF		



5C-2 What is the degree sequence of the given graph?

I CO5



- a) $\langle 4,3,2,2,2,2 \rangle$
- b) $\langle 5,4,3,3,3,2 \rangle$
- c) $\langle 4,3,2,2,2,2 \rangle$
- d) $\langle 5,4,3,3,2,1 \rangle$

5C-3 Which of the following sequences is not a graphic sequence?

I CO5



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 (Regulation :R22)
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- a) $\langle 7,6,6,4,4,3,2,2 \rangle$
- b) $\langle 5,5,3,3,2,1,1 \rangle$
- c) $\langle 7,6,5,4,4,3,2,1 \rangle$
- d) $\langle 8,7,7,6,4,2,1,1 \rangle$

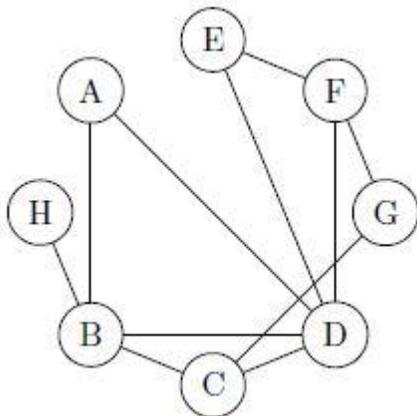
5C-4 Which of the following statement is False?

- a) A path is a walk with no repeated vertex
- b) Circuit with no repeated vertex is called a cycle.
- c) The sum of the degrees of all the vertices of a graph is thrice the number of edges in the graph
- d) Circuits refer to the closed trails

II

CO5

5C-5 Observe the following graph. (MSQ)



Choose the correct option(s) from below.

- a) $\{D-E-F-G-C-D\}$ is a cycle
- b) $\{A-B-D-A\}$ is not a cycle
- c) $\{A-B-D-C-G-F-D-A\}$ is a circuit
- d) $\{A-B-D-C-D-F\}$ is a trail
- e) $\{H-B-D-C-G-F-D-A\}$ is a trail

II

CO5



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Faculty Name&Designation	S. VARSHA REDDY ASST PROF		

5C-6	<p>Let T be a tree having n vertices. How many distinct paths are there from vertex v_1 to vertex v_2 ?</p> <p>a) $n(n-1)2$</p> <p>b) $n-1$</p> <p>c) n</p> <p>d) 1</p>	I	CO5
5C-7	<p>For a simple graph with vertices, how many subgraphs can be constructed, such that the subgraph is an induced subgraph as well as a spanning subgraph?</p> <p>a) 0</p> <p>b) N</p> <p>c) 1</p> <p>d) $n-1$</p>	I	CO5
5C-8	<p>Which of the following statements is/are true?</p> <p>I If there is a walk from P to Q then, there must be a path from P to Q.</p> <p>II A graph can have an odd number of odd-degree vertices.</p> <p>III The number of edges in a tree is equal to one less than the number of vertices.</p> <p>a) Only I</p> <p>b) Only II</p> <p>c) Only III</p> <p>d) I and II</p> <p>e) I and III</p> <p>f) I, II and III</p>	I	CO5
5C-9	<p>Which of the following graph has a cut vertex?</p>	IV	CO5



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	a) C_n b) K_n c) Regular graph d) Tree		
5C-10	Arrange the following elements in ascending order using Bubble sort. And no of iterations required ----- 12, 40, 3, 13, 47, 55, 10. a) 6 b) 7 c) 5 d) 4	III	CO5
5C-11	An n-vertex graph has _____ edges. a) n^2 b) $n-1$ c) $n*n$ d) $n*(n+1)/2$	III	CO5
5C-12	The tree elements are called _____ a) vertices b) nodes c) points d) edge	III	CO5
5C-13	An undirected graph G which is connected and acyclic is called _____ a) bipartite graph b) cyclic graph c) tree d) forest	II	CO5
5C-14	A linear graph consists of vertices arranged in a line. a) false b) true c) either true or false d) cannot determined	II	CO5
5C-15	What is a bipartite graph? a) a graph which contains only one cycle b) a graph which consists of more than 3 number of vertices c) a graph which has odd number of vertices and even number of edges d) a graph which contains no cycles of odd length	III	CO5
	FILL IN THE BLANKS	BT Level	Course Outcome
5F-1	The travelling salesman problem can be solved using _____	I	CO5
5F-2	_____ is the maximum number of edges in an acyclic undirected graph with k vertices.	I	CO5



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	c) Spanning tree () c) A tree having a single internal vertex and n-1 leaves d) simple graph () d) representing universal relation e) complete digraph () e) no multiple edges, self-loops and parallel edges		
5M-3	a)Time complexity of Prim’s algorithm () a) priority queue data structure b)time complexity of Kruskal’s algorithm () b)O(ElogV) c) Prim’s algorithm can be implemented () c) O((V+E) logV) d) AVL () d)∑(deg(v))=2×E e) Hand shaking () e)every node need to follow balance factor	II	CO5
5M-4	A. Directed graph () a)some edges are directed and un directed B. Undirected graph () b) some parallel edges and loops C. Isolated graph () c) edges have a specific direction. D. Mixed graph () d) no concept of a “parent” or “child” E. Multi graph () e) no edges	III	CO5
5M-5	A. Connected graph () a)depends of edges ,number of vertices B. Disconnected graph () b) At latest one edge b/w every pair of vertices C. Planar graph () c) Any path doesn’t exist b/w every pair of vertices D. Regular graph () d) Drawn in separate plane without any edge crossings E. Graph () e) Same degree	III	CO5

UNIT-V: Graph Theory: Basic Concepts, Isomorphism and Subgraphs, Trees and their Properties, Spanning Trees, Binary Trees, Planar Graphs, Euler’s Formula, Multi-graphs and Euler Circuits, Hamiltonian Graphs, Chromatic Numbers, The Four-Color Problem.

PART-A

1.	3. Define a Graph.(understanding)	2	CO5
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4.	Define a Sub graph with examples. (understanding)		
2.	What are the various types of graph? (remembering)	1	CO5
3.	Define a Bipartite and complete bipartite graph with one example.(applying)	3	CO5
4.	What is connected graph and disconnected graph? (analyzing)	4	CO5
5.	What is a Spanning tree? (remembering)	1	CO5
6.	a. Define a Sub graph with examples. (understanding) b. Define graph Isomorphism.(understanding)	1	CO5
7.	a. Define graph Isomorphism.(understanding) b. Distinguish between Euler path and Euler circuit? (evaluating)	5	CO5
8.	a. Define Hamiltonian cycle and Hamilton path.(understanding) b. How chromatic number help in map coloring?(applying)	2	CO5
9.	a. What is Graph coloring. b. Define Rooted tree.(understanding)	2	CO5
10.	What is Spanning trees. .(understanding)	2	CO5

PART-B

1.	a) Explain about Kruskal’s algorithm.(understanding) b) Find the minimal spanning tree by using Kruskal’s algorithm for the following given graph. (creating)	2	CO5
2.	a. Explain about Prim’s algorithm. (applying) b. Find the minimal spanning tree by using prim’s algorithm for the following given graph. (creating)	3	CO5
3.	What is a planar graph? Mention the properties of a planar graph. (analyzing)	4	CO5



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4.	<p>a) Explain DFS algorithm. (understanding) b) Apply a BFS algorithm to find a spanning tree. (applying)</p> <div style="text-align: center; margin: 10px 0;"> </div>		CO5
5.	<p>c) Draw a complete binary tree with 19 vertices. (creating) d) A complete binary tree has 25 leaves. How many vertices does it have? (creating)</p>	6	CO5
6.	<p>Show that the maximum number of edges in a complete bipartite graph with 'n' vertices is $n^2/4$. (creating).</p>		CO5
7.	<p>Find an Eulerian cycle in the graph. (creating)</p> <div style="text-align: center; margin: 10px 0;"> </div>	6	CO5
8.	<p>a) Explain about Isomorphism. (understanding) b) Show that following graphs are Isomorphic or not. (creating)</p> <div style="display: flex; justify-content: space-around; align-items: center; margin: 10px 0;"> <div style="text-align: center;"> </div> <div style="text-align: center;"> </div> </div>	2	CO5



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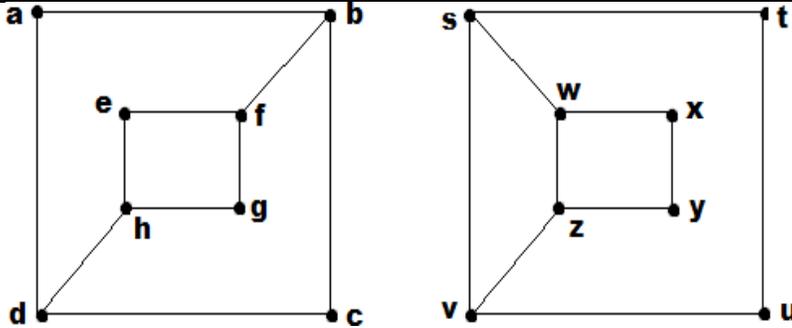
AcademicYear:2024-25

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II/IT

Faculty Name&Designation

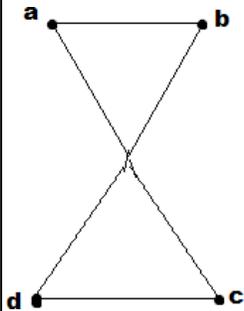
S. VARSHA REDDY ASST PROF



9. How many paths of length four are there from a to d in the simple graph G given below. (creating)

6

CO5



10. Draw the complete graph K_5 with vertices A, B, C, D, E. Draw all complete sub graph of K_5 with 4 vertices. (analyzing)

4

CO5

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SRI INDU COLLEGE OF ENGINEERING & TECHNOLOGY

(An Autonomous Institution under UGC, New Delhi) - Recognized under 2(f) and 12(B) of UGC Act 1956

II B.Tech. I Semester (REGULAR) End Examinations, FEBRUARY – 2024.

(R22CSE2111) DISCRETE MATHEMATICS

02/02/2024

(For AIML, AIDS & IoT)

Day- 3 (FN)

Duration: 3 Hrs

Maximum Marks: 60M

Blooms Taxonomy : (I-Remembering, II-Understanding, III-Appling, IV-Analyzing, V-Evaluating and VI-Creating)

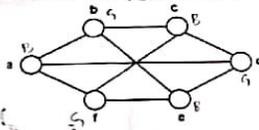
Course Outcomes : CO

PART – A

(10Qx1M=10M)

Answer **ALL** the following questions.

- | | | |
|--|-----|-----|
| 1. a) Write the truth table for Implication rule. | I | CO1 |
| b) Define logical form of Modus ponens rule. | I | CO1 |
| c) List out all possible number of elements in a standard POSET notation-[D30,/] | IV | CO2 |
| d) Give the definition of equal sets with an example. | II | CO2 |
| e) Define the Semigroup and give an example. | II | CO3 |
| f) Define Lattice and give an example. | II | CO3 |
| g) State principle of Inclusion and Exclusion. | I | CO4 |
| h) How many ways can 20 similar books be placed on 5 different shelves. | III | CO4 |
| i) Define Complete Graph with an example. | I | CO5 |
| j) Identify the chromatic number to the following graph | III | CO5 |



PART – B

(5Qx10M=50M)

Answer **FIVE** questions choosing at least one from each unit.

UNIT-I

- | | | |
|--|-----|-----|
| 2a. Verify the following inference is valid or not. | III | CO1 |
| i) If there is was a barigate, then the travelling was difficult. | | |
| ii) If they arrive on time, then travelling was not difficult. | | |
| iii) They arrived on time, hence there was no barigate. | | |
| (OR) | | |
| 2b. Construct the truth table for the statement and state the statement is tautology or not. | IV | CO1 |
| $[p \vee q \wedge (\sim r)] \leftrightarrow q$. | | |

UNIT-II

- | | | |
|--|----|-----|
| 3a. Show that the relation "congruence modulo 5" is an equivalence relation on the set of integers $R = \{(a, b) / a = b(\text{mod } 5)\}$ | I | CO2 |
| (OR) | | |
| 3b. Construct the Hasse diagram for $S = \{(2, 3, 5, 6, 8, 10, 12, 15, 24), /, \}$ and also find minimal and maximal elements. | VI | CO |

UNIT-III

4a. Show that the relation \leq defined on a set of positive integers I_+ is a partial order relation.

IV CO3

(OR)

4b. A committee of three experts for deciding the accepting or rejection of photographs for exhibition is provided with burgers which members of the committee push to indicate. Design a circuit, so that a bell will ring when there is a majority vote for acceptance.

II CO3

UNIT-IV

5a. Find the number of integers between 1 and 500 inclusive that are not divisible by 5, 6, and 8.

II CO4

(OR)

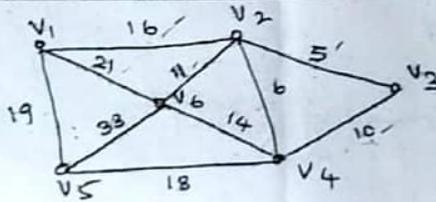
5b. Find the number of ways the letters $\{5a, 4b, 3c\}$ be arranged, so that all the letters of same type is not in same block.

II CO4

UNIT-V

6a. Find a minimal spanning tree for the following graph using Kruskal's algorithm.

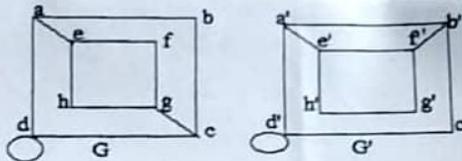
I CO5



(OR)

6b. (i) Show that there is no simple graph with degree sequence $(1, 1, 3, 3, 3, 4, 6, 7)$.
(ii) Verify the following two graphs are isomorphic or not.

VI CO5



BR-22

SRI INDU COLLEGE OF ENGINEERING & TECHNOLOGY
II B.Tech - II Semester - I Mid Term Examination, April - 2024
(R22CSE2111) DISCRETE MATHEMATICS

D4

Duration: 2 Hrs

(For CSE,IT,CSIT,CS and DS)

Dt: 08-04-2024, Day-1 (FN)

Max Marks: 30M

Part - A

AB: -

Marks: 10Qx1/2M = 5M

Answer All multiple choice questions.

* (L1-Remembering, L2-Understanding, L3-Applying, L4-Analyzing, L5-Evaluating, and L6-Creating.)

- | | | | | Blooms Taxonomy Level | Course Outcomes |
|--|--|---|---|--|-----------------|
| 1. Which of the following bits is the negation of the bits "010110"? | A) 111001 | B) 001001 | C) 101001 | D) 111111 | [] I CO1 |
| 2. Which of the following state mentisa proposition? | A) Getmeag lass of milkshake | B) God bless you! | C) What is the time now? | D) The only odd prime number is 2 | [] I CO1 |
| 3. If $P \rightarrow q$ is logically equivalent to | A) $\neg p \vee \neg q$ | B) $p \vee \neg q$ | C) $\neg p \vee q$ | D) $\neg p \wedge q$ | [] II CO1 |
| 4. The statement, "At least one of your friends is perfect". Let $P(x)$ be "x is perfect" and let $F(x)$ be "x is your friend" and let the domain be all people. | A) $\forall x(F(x) \rightarrow P(x))$ | B) $\forall x(F(x) \wedge P(x))$ | C) $\exists x(F(x) \wedge P(x))$ | D) $\exists x(F(x) \rightarrow P(x))$ | [] II CO1 |
| 5. If $p \leftrightarrow q$ is logically equivalent to | A) $(p \rightarrow q) \rightarrow (q \rightarrow p)$ | B) $(p \rightarrow q) \vee (q \rightarrow p)$ | C) $(p \rightarrow q) \vee (q \rightarrow p)$ | D) $(p \wedge q) \rightarrow (q \wedge p)$ | [] II CO1 |
| 6. "The product of two negative real-numbers is not negative." is given b | A) $\exists x \forall y((x < 0) \wedge (y < 0) \rightarrow (x y > 0))$ | B) $\exists x \exists y((x < 0) \wedge (y < 0) \wedge (x y > 0))$ | C) $\forall x \exists y((x < 0) \wedge (y < 0) \wedge (x y > 0))$ | D) $\forall x \forall y((x < 0) \wedge (y < 0) \rightarrow (x y > 0))$ | [] II CO1 |
| 7. A nor dered collection of objects is | A) Relation | B) Function | C) Set | D) Proposition | [] II CO2 |
| 8. The sub set of power set of empty set has exactly | A) One | B) Two | C) Zero | D) Three | [] II CO2 |
| 9. $S, *$ is said to be semigroup if | A) $*$ is binary operation on S | B) both A and B | C) $*$ is associative on S | D) S has an identity element with respect to $*$ | [] I CO3 |
| 10. If $a*(b*c) = (a*b) * c \forall a, b, c \in S$ then $*$ is said to be on s | A) Closed | B) associate | C) Commutative | D) distributive | [] II CO3 |

Answer All fill in the blank questions.

Marks: 6Qx1/2M = 3M

- | | | |
|--|----|-----|
| 11. _____ is the proposition "if p then q" | II | CO1 |
| 12. The Proposition $q \rightarrow p$ is called _____ of $p \rightarrow q$ | II | CO1 |
| 13. $\{x: x \in \mathbb{N} \text{ and } x \text{ is prime}\}$ then it is _____ | I | CO2 |
| 14. Two sets are called disjoint if there _____ is the empty set. | II | CO2 |
| 15. Let $G = \{1, -1, i, -i\}$ is group under multiplication then the inverse of i is _____. | I | CO3 |
| 16. A non empty set A is termed as an algebraic structure _____ | II | CO3 |

P.T.O.

Answer All Match the following questions.

Marks: 2Qx1M = 2M

17.	1.	Conjunction	A)	It is always false	I	CO1
	2.	Disjunction	B)	Combination of both T&F		
	3.	Tautology	C)	$P \wedge Q$		
	4.	Contradiction	D)	$P \vee Q$		
	5.	Contingency	E)	It is always true		
18.	1.	Union	A)	$A - B$	I	CO2
	2.	Intersection	B)	$A \cup B$		
	3.	Disjoint	C)	$A \cap B$		
	4.	Set difference	D)	$A \times B$		

Part - B

Answer any FOUR questions.

Marks: 4Qx5M = 20M

- 19 a) prove that $[(p \vee q) \wedge \sim (\sim p \wedge (\sim q \vee \sim r))] \vee (\sim p \wedge \sim q) \vee (\sim p \wedge \sim r)$ is a tautology II CO2
- b) show that $(p \rightarrow q), (r \rightarrow s), (q \rightarrow t), (s \rightarrow u), \sim (t \wedge u), (p \rightarrow r) \Rightarrow \sim p$ II CO1
- 20 a) Find the DNF of the following $p \rightarrow \{(p \rightarrow q) \wedge \sim (\sim q \vee \sim p)\}$ VI CO1
 b) Find CNF of the following $[\sim (p \vee q) \leftrightarrow (p \wedge q)]$ II CO1
- 21 a) Prove the argument is valid $\forall x, [P(x) \rightarrow \{q(x) \wedge r(x)\}]$ V CO1
 $\forall x, [P(x) \wedge s(x)]$
 $\wedge \forall x, [r(x) \wedge s(x)]$
- b) Prove that $(P \rightarrow Q) \wedge (R \rightarrow Q) \leftrightarrow (P \vee R) \rightarrow Q$ VI CO1
- 22 Let $A = \{1, 2, 3, 4\}$ and let R be the relation on A defined by xRy if and only if "x divides y", written $X | y$. VI CO2
 i) Write down R as a set of ordered pairs.
 ii) Draw the diagram of R.
 iii) Determine in-degree and out-degrees of the each vertex.
- 23 Consider the following relations on the set $A = \{1, 2, 3\}$ I CO2
 $R_1 = \{(1, 1), (1, 2), (1, 3), (3, 3)\}$
 $R_2 = \{(1, 1), (1, 2), (2, 1), (2, 2), (3, 3)\}$ and
 $R_3 = \{(1, 1), (1, 2), (2, 2), (2, 3)\}$.
 Which of these are i) reflexive ii) symmetric iii) transitive and iv) anti symmetric?
- 24 What is binary operation and write the properties of binary operations? I CO3

COURSE OUTCOMES (CO's)

Academic Year: 2024-2025

Class: II YEAR-I ISEM IT

Course Name: Business Economics and Financial Analysis (R22HMS1212)

At the end of the course, the student will be able to

Course Outcomes (COs)	
C214.1	Able to understand the basic components and the design of CPU, ALU and Control Unit.
C214.2	Ability to understand memory hierarchy and its impact on computer cost/performance.
C214.3	Ability to understand the advantage of instruction level parallelism and pipelining for high performance Processor design.
C214.4	Ability to understand the instruction set, instruction formats and addressing modes of 8086.
C214.5	Ability to write assembly language programs to solve problems.
C214.6	Design a pipeline for consistent execution of instructions with minimum hazards

COURSE ARTICULATION MATRIX

COs	POs												PSOs		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C214.1	3	-	1	-	2	-	-	-	-	-	-	-	-	-	-
C214.2	3	-	2	-	3	-	-	-	-	-	-	-	-	1	-
C214.3	1	1	-	3	3	-	-	-	-	-	-	-	-	1	-
C214.4	-	-	1	-	2	-	-	-	-	-	-	-	-	-	-
C215.5	3	3	-	1	-	-	-	-	-	-	-	-	-	-	-
C215.6	-	-	1	1	2	-	-	-	-	-	-	-	-	1	-
C214	2.2	2	1.25	1.67	2.6	-	-	-	-	-	-	-	-	1	-

3: High

2: Medium

1: Low

BUSINESS ECONOMICS AND FINANCIAL ANALYSIS

BR22 – B.TECH. – INFORMATION TECHNOLOGY

SRI INDU COLLEGE OF ENGINEERING & TECHNOLOGY
(An Autonomous Institution under UGC, New Delhi)

B.Tech. - II Year – II Semester

L T P C
3 0 0 3

(R22HMS1212) BUSINESS ECONOMICS AND FINANCIAL ANALYSIS

Course Objective: To learn the basic business types, impact of the economy on Business and Firms specifically. To analyze the Business from the Financial Perspective.

Course Outcome: The students will understand the various Forms of Business and the impact of economic variables on the Business. The Demand, Supply, Production, Cost, Market Structure, Pricing aspects are learnt. The Students can study the firm's financial position by analysing the Financial Statements of a Company.

Unit – I: Introduction to Business and Economics

Business: Structure of Business Firm, Theory of Firm, Types of Business Entities, Limited Liability Companies, Sources of Capital for a Company, Non-Conventional Sources of Finance.

Economics: Significance of Economics, Micro and Macro Economic Concepts, Concepts and Importance of National Income, Inflation, Money Supply and Inflation, Business Cycle, Features and Phases of Business Cycle. Nature and Scope of Business Economics, Role of Business Economist, Multidisciplinary nature of Business Economics.

UNIT - II: Demand and Supply Analysis

Elasticity of Demand: Elasticity, Types of Elasticity, Law of Demand, Measurement and Significance of Elasticity of Demand, Factors affecting Elasticity of Demand, Elasticity of Demand in decision making, Demand Forecasting: Characteristics of Good Demand Forecasting, Steps in Demand Forecasting, Methods of Demand Forecasting.

Supply Analysis: Determinants of Supply, Supply Function and Law of Supply.

UNIT - III: Production, Cost, Market Structures & Pricing

Production Analysis: Factors of Production, Production Function, Production Function with one variable input, two variable inputs, Returns to Scale, Different Types of Production Functions.

Cost analysis: Types of Costs, Short run and Long run Cost Functions.

Market Structures: Nature of Competition, Features of Perfect competition, Monopoly, Oligopoly, Monopolistic Competition. **Pricing:** Types of Pricing, Product Life Cycle based Pricing, Break Even Analysis, Cost Volume Profit Analysis.

UNIT - IV: Financial Accounting: Accounting concepts and Conventions, Accounting Equation, Double-Entry system of Accounting, Rules for maintaining Books of Accounts, Journal, Posting to Ledger, Preparation of Trial Balance, Elements of Financial Statements, Preparation of Final Accounts(Simple Problems).

UNIT - V: Financial Ratios Analysis: Concept of Ratio Analysis, Importance and Types of Ratios, Liquidity Ratios, Turnover Ratios, Profitability Ratios, Proprietary Ratios, Solvency, Leverage Ratios – Analysis and Interpretation (simple problems).

TEXT BOOKS:

1. D. D. Chaturvedi, S. L. Gupta, Business Economics - Theory and Applications, International Book House Pvt. Ltd. 2013.
2. Dhanesh K Khatri, Financial Accounting, Tata Mc-Graw Hill, 2011.
3. Geethika Ghosh, Piyali Gosh, Purba Roy Choudhury, Managerial Economics, 2e, Tata McGraw Hill Education Pvt. Ltd. 2012.

REFERENCE BOOKS:

1. Paresh Shah, Financial Accounting for Management 2e, Oxford Press, 2015.
2. S. N. Maheshwari, Sunil K Maheshwari, Sharad K Maheshwari, Financial Accounting, 5e, Vikas Publications, 2013.

Verified & Appr
by
6/1/25



**SRI INDU COLLEGE OF ENGINEERING &
TECHNOLOGY**
LESSON PLAN
(Regulation: R22)

Department of Information Technology

Prepared
on Rev1:
Page: 9 of 3

Sub. Code & Title **R22HMS1212 Business Economics and Financial Analysis**

Academic Year: 2024-25 **Year/Sem./Section** **II-II**

Faculty Name & Designation **N.Ramya (Asst.Prof)**

Unit/ Item No.	Topic (s)	Book Reference	Page (s)		Teaching Methodology	Propose d No. of Periods	Actual Date of Handled	CO/ RBT
			From	To				
UNIT-I								
1	Introduction to Business & Economics					11		
1.1	Business: Structure of Business Firm	T1	1	4	Black board	01		CO1,L2
1.2	Theories of firm	T1	5	6	Black board	01		CO1,L3
1.3	Types of Business Entities Limited Liability companies	T1	7	17	Black board	01		CO1,L1
1.4	Sole proprietorship Partnership and partnership deed	T1	18	21	Black board	01		CO1,L2
1.5	Sources of Capital for a Company,	T1	22	25	Black board	01		CO1,L2
1.6	Non-Conventional Sources of Finance.	T1	26	29	Black board	01		CO1, L2
1.7	Economics: Significance of Economics Micro and Macro Economic Concepts	T1	30	35	Black board	01		CO1, L1
1.8	Importance of National Income Inflation Money Supply and Inflation	T1	35	37	Black board	01		CO1, L4
1.9	Business Cycle features and phases of business cycle	T1	37	38	Black board	01		CO1, L4
1.10	Role of Business Economist	T1	38	40	Black board	01		CO1, L4
1.11	Multidisciplinary nature of Business Economics.	T1	41	48	Black board/	01		CO1, L1
	Review	Signature of the HOD/Coordinator						

UNIT-II							
2	Demand and Supply Analysis					07	
2.1	Demand and its features Demand function Types of demand	T1	49	50	Black board	01	CO2,L1
2.2	Law of demand	T1	50	51	Black board	01	CO2,L2
2.3	Elasticity of Demand Types of Elasticity	T1	51	54	Black board	01	CO2,L1
2.4	Measurement and Significance of elasticity of demand, Factors affecting Elasticity of Demand,	T1	54	60	Black board	01	CO2,L2
2.5	Demand Forecasting	T1	60	62	Black board	01	CO2,L1
2.6	Characteristics of Good Demand Forecasting	T1	63	64	Black board	01	CO2,L2
2.7	Steps in Demand Forecasting Methods of Demand Forecasting. Supply Analysis: Determinants of Supply, Supply Function and Law of Supply.	T1	64	65	Black board	01	CO2,L3
	Review	Signature of the HOD/Coordinator					

Unit / Item No.	Topic (s)	Book Reference	Page (s)		Teaching Methodology	Proposed No. of Periods	Actual Date of Handled	CO/RBT
			From	To				
UNIT-III								
3	Production, Cost, Market Structures & Pricing					09		
3.1	Production Analysis: Production, Factors of Production, Production Function,	T1	76	77	Black board	02		CO3,L2
3.2	Production Function with one variable input, two variable inputs	T1	78	79	Black board	01		CO3,L3
3.3	Returns to Scale, Different Types of Production Functions	T1	79	80	Black board	01		CO3,L1
3.4	Cost analysis: Types of Costs, Short run and Long run Cost Functions	T1	80	82	Black board	01		CO3,L1
3.5	Market Structures: Nature of Competition Features of Perfect competition	T1	83	88	Black board	02		CO3,L3
3.6	Monopoly, Oligopoly	T1	89	94	Black board	01		CO3,L3
3.7	Monopolistic Competition	T1	94	98	Black board	01		CO3,L3
3.8	Pricing: Types of Pricing	T1	98	100	Black board	01		CO3,L3
3.9	Product Life Cycle based Pricing	T1	101	103	Black board	01		CO3,L3
3.10	Break Even analysis	T1	104	105	Black board	01		CO3,L3
3.11	Cost Volume Profit Analysis	T1	106	109	Black board	01		CO3,L3
	Review	Signature of the HOD/Coordinator						

UNIT-IV								
4	Financial Accounting:						13	
4.1	Accounting concepts and Conventions	T1	110	114	Black board/ppt	01	CO4,L2	
4.2	Accounting Equation Double- Entry system of Accounting	T1	115	117	Black board/ppt	01	CO4,L1	
4.3	Rules for maintaining Books of Accounts	T1	118	119	Black board/ppt	01	CO4,L2	
4.4	Journal	T1	119	125	Black board/ppt	01	CO4,L1	
4.5	Solving problems	T1	126	130	Black board/ppt	01	CO4,L6	
4.6	Posting to ledgers	T1	131	135	Black board/ppt	01	CO4,L2	
4.7	Solving problems	T1	136	140	Black board/ppt	01	CO4,L1	
4.9	Preparation of Trial Balance,	T1	141	145	Black board/ppt	01	CO4,L1	
4.10	Solving problems	T1	146	149	Black board/ppt	01	CO4,L1	
4.11	Elements of Financial Statements,	T1	150	154	Black board/ppt	01	CO4,L6	
4.12	Solving problems on trading and p & l a/c	T1	155	160	Black board/ppt	01	CO4,L2	
4.13	Preparation of Final Accounts	T1	161	165	Black board/ppt	01	CO4,L3	
4.14	Solving final account problems	T1	166	170	Black board/ppt	01	CO4,L2	
	Review	Signature of the HOD/Coordinator						

Unit / Item No.	Topic (s)	Book Reference	Page (s)		Teaching Methodology	Proposed No. of Periods	Actual Date of Handled	CO/RBT
UNIT-V								
5	Financial Ratios Analysis						14	
5.1	Concept of Ratio Analysis	T1	171	172	Black board/ppt	01		CO5,L2
5.2	Importance and Types of Ratios	T1	173	175	Black board/ppt	01		CO5,L2
5.3	Liquidity Ratios	T1	176	180	Black board/ppt	01		CO5,L2
5.4	Solving problems on liquidity ratios	T1	181	182	Black board/ppt	01		CO5,L2
5.5	Turnover Ratios	T1	183	185	Black board/ppt	01		CO5,L2
5.6	Solving problems on Turnover Ratios	T1	186	190	Black board/ppt	01		CO5,L2
5.7	Profitability Ratios	T1	191	195	Black board/ppt	01		CO5,L3
5.8	Solving problems on profitability ratios	T1	196	200	Black board/ppt	01		CO5,L3
5.9	Proprietary Ratios	T1	201	205	Black board/ppt	01		CO5,L2
5.10	Solving problems on proprietary ratios	T1	206	210	Black board/ppt	01		CO6,L2
5.11	Solvency, Leverage Ratios Analysis and Interpretation	T1	210	215	Black board/ppt	01		CO6,L5
5.12	Solving problems on leverage ratios	T1	216	220	Black board/ppt	01		CO6,L5
	Review	Signature of the HOD/Coordinator						

TEXT BOOK:

1. D. D. Chaturvedi, S. L. Gupta, Business Economics - Theory and Applications, International Book House Pvt. Ltd. 2013.
2. Dhanesh K Khatri, Financial Accounting, Tata Mc-Graw Hill, 2011.
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ASSIGNMENT- I

S.No.	Assignment Questions	Course Outcome	Books to be Referred
Set-1: Roll no's 1-6			
1	write the nature and scope of Business economics	C01	T1
2.	Classify the Elasticity of Demand and Types of Elasticity of demand	C02	T1
3.	What are the Factors effecting elasticity of demand.	C02	T1
4.	Describe about Micro Economic and Macro Economic concepts.	C01	T1
5.	What are the Different types of production functions	C03	T1
Set-2: Roll no's 7-11			
1	What is national Income and describe the Concepts of national Income.	C01	T1
2.	what are the characteristics of good demand forecasting.	C02	T1
3.	What are the Methods for demand forecasting.	C02	T1
4.	What are the factors of production and functions.	C03	T1
5.	Discuss the elasticity of Demand in Decision Making.	C02	T1
Set-3: Roll no's 12-16			

1	Classify the Elasticity of Demand and Types of Elasticity of demand	C02	T1
2.	What are the Factors effecting elasticity of demand	C02	T1
3.	Describe about Micro Economic and Macro Economic concepts	C01	T1
4.	What are the Different types of production functions	C03	T1
5.	write the nature and scope of Business economics.	C01	T1
	Set-4: Roll no's 17-21		
1	What are the Factors effecting elasticity of demand	C02	T1
2.	Describe about Micro Economic and Macro Economic concepts.	C01	T1
3.	What are the Different types of production functions	C03	T1
4.	write the nature and scope of Business economics.	C01	T1
5.	Classify the Elasticity of Demand and Types of Elasticity of demand	C02	T1
	Set-5: Roll no's 22-26		
1	what are the characteristics of good demand forecasting	C02	T1
2.	What are the Methods for demand forecasting.	C02	T1
3.	what are the factors of production and functions.	C03	T1
4.	Discuss the elasticity of Demand in Decision Making.	C02	T1
5.	What is national Income and describe the Concepts of national Income.	C01	T1
	Set-6: Roll no's 27-31		
1	What are the Factors effecting elasticity of demand	C01	T1
2.	Describe about Micro Economic and Macro Economic concepts.	C01	T1
3.	What are the Different types of production functions	C02	T1
4.	write the nature and scope of Business economics.	C02	T1
5.	Classify the Elasticity of Demand and Types of Elasticity of demand	C03	T1
	Set-7: Roll no's 31-35		

1	What are the Factors effecting elasticity of demand.	C02	T1
2.	Classify the Elasticity of Demand and Types of Elasticity of demand	C02	T1
3.	write the nature and scope of Business economics.	C01	T1
4.	write the nature and scope of Business economics.	C01	T1
5.	Classify the Elasticity of Demand and Types of Elasticity of demand	C02	T1
Set-8: Roll no's 36-40			
1	what are the factors of production and functions.	C03	T1
2.	Discuss the elasticity of Demand in Decision Making.	C02	T1
3.	What is national Income and describe the Concepts of national Income.	C01	T1
4.	what are the characteristics of good demand forecasting.	C02	T1
5.	What are the Methods for demand forecasting.	C02	T1
Set-9: Roll no's 41-45			
1	What are the Different types of production functions	C03	T1
2.	write the nature and scope of Business economics.	C01	T1
3.	Classify the Elasticity of Demand and Types of Elasticity of demand	C02	T1
4.	What are the Factors effecting elasticity of demand.	C02	T1
5.	Describe about Micro Economic and Macro Economic concepts	C01	T1
Set-10: Roll no's 46-50			
1	Discuss the elasticity of Demand in Decision Making.	C02	T1
2.	what are the characteristics of good demand forecasting.	C02	T1
3.	What are the Methods for demand forecasting.	C02	T1
4.	what are the factors of production and functions.	C03	T1
5.	Describe micro and macro concepts.	C01	T1

Set-11: Roll no's 51-55			
1	Discuss the elasticity of Demand in Decision Making.	C02	T1
2.	What is national income and concepts of national income?	C01	T1
3.	what are the characteristics of good demand forecasting.	C02	T1
4.	What are the Methods for demand forecasting?	C02	T1
5.	what are the factors of production and functions.	C03	T1
Set-12: Roll no's 56-60			
1	write the nature and scope of Business economics	C01	T1
2.	Classify the Elasticity of Demand and Types of Elasticity of demand	C02	T1
3.	What are the Factors effecting elasticity of demand.	C02	T1
4.	Describe about Micro Economic and Macro Economic concepts.	C01	T1
5.	What are the Different types of production functions	C03	T1
Set-13: Roll no's 61-65			
1	write the nature and scope of Business economics	C01	T1
2.	Classify the Elasticity of Demand and Types of Elasticity of demand	C02	T1
3.	What are the Factors effecting elasticity of demand.	C02	T1
4.	Describe about Micro Economic and Macro Economic concepts.	C01	T1
5.	What are the Different types of production functions	C03	T1
Set-14: Roll no's 66-70			
1	What is national Income and describe the Concepts of national Income.	C01	T1
2.	what are the characteristics of good demand forecasting.	C01	T1
3.	What are the Methods for demand forecasting.	C02	T1
4.	what are the factors of production and functions.	C02	T1

5.	Discuss the elasticity of Demand in Decision Making.	C03	T1
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ASSIGNMENT- II

S.No.	Assignment Questions	Course Outcome	Books to be Referred																																				
	Set-1: Roll no's 1-5																																						
1	What is the difference between monopolistic Competition and pure competition?	C03	T1																																				
2	Write the accounting concepts?	C04	T1																																				
3	<p>a) Write the format of Trial Balance .</p> <p>b) Prepare a trial balance as on 31-12-214 from the below information</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Particulars</th> <th>Rs</th> <th>Particulars</th> <th>Rs</th> </tr> </thead> <tbody> <tr> <td>Sundry Debtors</td> <td>32000</td> <td>Bills Payable</td> <td>7500</td> </tr> <tr> <td>Stock</td> <td>22000</td> <td>Purchases</td> <td>218870</td> </tr> <tr> <td>Cash in hand</td> <td>35</td> <td>Cash at bank</td> <td>1545</td> </tr> <tr> <td>Plant and machinery</td> <td>17500</td> <td>Sundry creditors</td> <td>10650</td> </tr> <tr> <td>Trade expenses</td> <td>1075</td> <td>Sales</td> <td>234500</td> </tr> <tr> <td>Salaries</td> <td>2225</td> <td>Carriage outward</td> <td>400</td> </tr> <tr> <td>Stock</td> <td>900</td> <td>Discounts (Dr)</td> <td>1100</td> </tr> <tr> <td>Capital</td> <td>79500</td> <td>Premise</td> <td>34500</td> </tr> </tbody> </table>	Particulars	Rs	Particulars	Rs	Sundry Debtors	32000	Bills Payable	7500	Stock	22000	Purchases	218870	Cash in hand	35	Cash at bank	1545	Plant and machinery	17500	Sundry creditors	10650	Trade expenses	1075	Sales	234500	Salaries	2225	Carriage outward	400	Stock	900	Discounts (Dr)	1100	Capital	79500	Premise	34500	C04	T1
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Capital	79500	Premise	34500																																				
4	What is profitability Ratio?	C05	T1																																				
5	What are the limitations ratio? Does Ratio analysis really measure the financial performance of a company?	C05	T1																																				
	Set-2: Roll no's 6-10																																						
1	Distinguish between short and long run cost function	C03	T1																																				
2	Explain the accounting conventions	C04	T1																																				
3	<p>Write the journal entries for following transactions Date 2019</p> <p>Jan 1 Mr. Ram commenced business withRs.98000</p> <p>Jan 2 Cash deposited into state bank of India Rs.50000</p> <p>Jan 4 Purchased office furniture for Rs.10000 paid through bank</p> <p>Jan 5 Purchased goods from Amar Rs.12000</p> <p>Jan 7 Purchased goods for cashRs.5000 from Ramesh</p> <p>Jan 8 Cash Sales Rs.11000</p> <p>Jan 10 Goods sold to Akbar for Rs.10000</p>	C04	T1																																				

	Jan 12 Paid rent by cheque Rs.4000 Jan 14 Paid to Amar Rs.6000 on account Jan 15 Goods returned by Akbar Rs.1000 Jan 16 Goods returned to Amar Rs.15000 Jan 18 Paid for advertising Rs.1200 Jan 19 Received from Akbar by cheque Rs.3000 Jan 21 Loan taken from Raju Rs.9000 Jan 25 Goods purchased for Rs.15000, paid by cheque Jan 28 Drawings from bank by Ram Rs.1500 Jan 31 Salaries paid by cheque Rs.12000		
4	Briefly explain about turn over Ratios?	C05	T1
5	What are leverage Ratios?	C05	T1
	Set-3: Roll no's 11-15		
1	Explain about Break Even Analysis.	C03	T1
2	Classify the accounting equations.	C04	T1
3	Write the journal entries for following transactions Date (2019) March 1 M Ganesh commenced business with cash of RS. 90000 March 2 Purchased a computer for office use for cash Rs.10000 March 4 Bought goods from Shankar for Rs.8000 March5 Sold goods to Naresh for cash Rs.12000 March8 Purchased goods for cash Rs.5000 from Suresh March9 Sold goods on credit to Mahesh Rs.15000 March11 Paid for printing expenses Rs.900 March13 Goods returned to Shankar on account Rs.600 March14 Cash Sales Rs.18000 March15 Wages paid Rs.3000 March17 Mahesh returned goods Rs.2000 March18 Paid to Shankar Rs.3400 on account March20 Received from Mahesh on account Rs.7000 March23 Rent paid Rs.1500 March25 Commission received Rs.1200 March28 Paid Salaries Rs.5000 March30 Ganesh taken Rs.1000 for personal expenses March31 Goods taken for personnel use Rs.800	C04	T1
4	What is gross profit Ratio and net Profit Ratio?	C05	T1
5	Briefly explain about turn over Ratios?	C05	T1
	Set-4: Roll no's 16-20		
1	Describe about monopolistic competition and Oligopoly with example.	C03	T1
2	Write the double entry bookkeeping system in accounting?	C04	T1
3	Write the accounting concepts?	C04	T1
4	A) Calculate net profit Ratio from the following data. 1)Net Sales Rs.50000 2)Cost of goods sold Rs.20000 3)Administrative Expenses Rs.3000 4)Selling and Distribution expenses Rs.4000 4)Loss on sale of fixed assets Rs.3000 5)Interest on Investment received Rs.2000 6)Tax 20%	C05	T1

	<p>B)Compute Inventory Ratio and also the Inventory Holding Period.</p> <p>A firm sold goods worth Rs. 5,00,000 and its gross profit is 20% of sales value.The inventory at the beginning of the year was Rs.16,000 and at end of the year was 14,000.</p>																																															
5	What are leverage Ratios?	C05	T1																																													
Set-5: Roll no's 21-25																																																
1	Write the product Life cycle based on pricing?	C03	T1																																													
2	Explain the rules for maintaining books of accounts.	C04	T1																																													
3	<p>Prepare final account from the following balance sheet.</p> <table border="1"> <thead> <tr> <th>Paticulars</th> <th>Debit</th> <th>Credit</th> </tr> </thead> <tbody> <tr> <td>Furniture</td> <td>640</td> <td>-</td> </tr> <tr> <td>Building</td> <td>6250</td> <td>-</td> </tr> <tr> <td>Plant and Machinery</td> <td>7500</td> <td>-</td> </tr> <tr> <td>Stock</td> <td>3400</td> <td>-</td> </tr> <tr> <td>Purchases</td> <td>6000</td> <td>-</td> </tr> <tr> <td>Advertising</td> <td>1000</td> <td>-</td> </tr> <tr> <td>Cash</td> <td>1200</td> <td>-</td> </tr> <tr> <td>Salaries</td> <td>3000</td> <td>-</td> </tr> <tr> <td>Insurance</td> <td>800</td> <td>-</td> </tr> <tr> <td>Debtors</td> <td>2000</td> <td>-</td> </tr> <tr> <td>Capital</td> <td>-</td> <td>12500</td> </tr> <tr> <td>Sales</td> <td>-</td> <td>15000</td> </tr> <tr> <td>Creditors</td> <td>-</td> <td>4290</td> </tr> <tr> <td>Total</td> <td>31790</td> <td>31790</td> </tr> </tbody> </table> <p>Adjustments:</p> <ol style="list-style-type: none"> 1)Closing stock 2000 2)Depreciation on Building@5% 3)Salaries Outstanding Rs.300 4)Insurance Prepaid Rs.100 5)Interest on Capital@5% 6)Bad Debts Rs.100 	Paticulars	Debit	Credit	Furniture	640	-	Building	6250	-	Plant and Machinery	7500	-	Stock	3400	-	Purchases	6000	-	Advertising	1000	-	Cash	1200	-	Salaries	3000	-	Insurance	800	-	Debtors	2000	-	Capital	-	12500	Sales	-	15000	Creditors	-	4290	Total	31790	31790	C04	T1
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Creditors	-	4290																																														
Total	31790	31790																																														
4	How many types of Ratios are available?	C05	T1																																													
5	Explain the Limitation of Ratio analysis	C05	T1																																													
Set-6: Roll no's 26-30																																																
1	Explain Return to Scale	C03	T1																																													
2	What is Trial Balance and explain format of Trial balance?	C04	T1																																													
3	Calculate liquidity ratios from the following balance sheet	C05	T1																																													
4	<p>Enter the following transactions in Journal and post them into Ledger.</p> <ol style="list-style-type: none"> 1.Entertainment expenses Rs.1000 2.Madhu commenced business with cash Rs.100000 3.cheque deposited in bank Rs.2000 	C0	T1																																													
5	Explain about Solvency Ratios?	C05	T1																																													

Set-7: Roll no's 31-35																																																
1	Write the Short Run and Long Run Cost Function.	CO3	T1																																													
2	Explain the accounting conventions.	CO4	T1																																													
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Set-8: Roll no's 36-40																																																
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3	Enter the following transactions in Journal and post them into Ledger. <ol style="list-style-type: none"> 1. Entertainment expenses Rs.1000 2. Madhu commenced business with cash Rs.100000 3. cheque deposited in bank Rs.2000 	CO4	T1																																													
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	is 20% of sales value. The inventory at the beginning of the year was Rs.16,000 and at end of the year was 14,000.		
5	Briefly explain about turn over Ratios?		T1
Set-9: Roll no's 41-45			
1	Explain Pricing methods	CO3	T1
2	What is Trial Balance and explain format of Trial balance?	CO4	T1
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5	Briefly explain about turn over Ratios?	CO5	T1
Set-10: Roll no's 46-50			
1	What is the difference between monopolistic Competition and pure competition?	CO4	T1
2	Explain the rules for maintaining books of accounts.	CO4	T1
3	Enter the following transactions in Journal and post them into Ledger. 2017 Jan 1 Mr. Ramesh started business with cash Rs.1,00,000 Jan 2 He purchased furniture for Rs.20,0000 Jan 3 He purchased goods for Rs.60,000 Jan 5 He sold goods for cash Rs.80,0000 Jan 6 He paid salaries Rs.10,000	CO4	T1
4	Write the Importance of Ratio analysis in present scenario of companies.	CO5	T1
5	Explain the Limitation of Ratio analysis	CO5	T1
Set-11: Roll no's 51-55			
1	Distinguish between short and long run cost function.	CO3	T1
2	Write the double entry book keeping system in accounting?	CO4	T1
3	Classify the accounting equations.	CO4	T1

4	<p>From the Balance Sheet of XYZ Co. Ltd., Calculate Liquidity Ratios.</p> <table border="1"> <thead> <tr> <th>Capital and Liabilities</th> <th>Amount</th> <th>Assets</th> <th>Amount</th> </tr> </thead> <tbody> <tr> <td>Preference shares capital</td> <td>100</td> <td>Land and Building</td> <td>225</td> </tr> <tr> <td>Equity shares capital</td> <td>150</td> <td>Plant and Machinery</td> <td>250</td> </tr> <tr> <td>General Reserve</td> <td>250</td> <td>Furniture and Fixtures</td> <td>100</td> </tr> <tr> <td>Debentures</td> <td>400</td> <td>Stock</td> <td>250</td> </tr> <tr> <td>Creditors</td> <td>200</td> <td>Debtors</td> <td>125</td> </tr> <tr> <td>Bills Payable</td> <td>50</td> <td>Cash at Bank</td> <td>250</td> </tr> <tr> <td>Outstanding Expenses</td> <td>50</td> <td>Cash in Bank</td> <td>125</td> </tr> <tr> <td>Profit and Loss Account</td> <td>100</td> <td>Prepaid Expenses</td> <td>50</td> </tr> <tr> <td>Bank Loans (Long Term)</td> <td>200</td> <td>Markable Securities</td> <td>125</td> </tr> <tr> <td></td> <td>1500</td> <td></td> <td>1500</td> </tr> </tbody> </table>	Capital and Liabilities	Amount	Assets	Amount	Preference shares capital	100	Land and Building	225	Equity shares capital	150	Plant and Machinery	250	General Reserve	250	Furniture and Fixtures	100	Debentures	400	Stock	250	Creditors	200	Debtors	125	Bills Payable	50	Cash at Bank	250	Outstanding Expenses	50	Cash in Bank	125	Profit and Loss Account	100	Prepaid Expenses	50	Bank Loans (Long Term)	200	Markable Securities	125		1500		1500	C05	T1																
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Set-12: Roll no's 56-60																																																															
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3	<p>Write the journal entries for following transactions Date 2019 Jan 1 Mr. Ram commenced business withRs.98000 Jan 2 Cash deposited into state bank of India Rs.50000 Jan 4 Purchased office furniture for Rs.10000 paid through bank Jan 5 Purchased goods from Amar Rs.12000 Jan 7 Purchased goods for cashRs.5000 from Ramesh Jan 8 Cash Sales Rs.11000 Jan 10 Goods sold to Akbar for Rs.10000 Jan 12 Paid rent by cheque Rs.4000 Jan 14 Paid to Amar Rs.6000 on account Jan 15 Goods returned by Akbar Rs.1000 Jan 16 Goods returned to Amar Rs.15000 Jan 18 Paid for advertising Rs.1200 Jan 19 Received from Akbar by cheque Rs.3000 Jan 21 Loan taken from Raju Rs.9000 Jan 25 Goods purchased for Rs.15000, paid by cheque Jan 28 Drawings from bank by Ram Rs.1500 Jan 31 Salaries paid by cheque Rs. 12000</p>	CO4	T1
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	SRI INDU COLLEGE OF ENGG & TECH Question Bank (Regulation: R22) Department of Information Technology		
	Sub. Code & Title	R22HMS1212 & Business Economics & Financial Analysis	
	Academic Year: 2023-24	Year/Sem./Section	II/II
	Faculty Name & Designation	N.Ramya (Asst.Prof)	

QUESTION BANK WITH BLOOMSTAXONOMY LEVEL (BTL)

(1. Remembering 2. Understanding 3. Applying 4. Analyzing 5. Evaluating 6. Creating)

UNIT - I: INTRODUCTION TO ENTREPRENEURSHIP			
OBJECTIVE TYPE QUESTIONS ½ MARK QUESTIONS		BT Level	Course Outcome
1C1	To carry out any _____ and achieve its objective of earning profit is required to allocate resources and coordinate properly. (a) Business (b) Organization (c) Partnership (d) Sole Proprietorship	I	CO1
1C2	_____ is a form of business organization which is engaged in some business activities. (a) Business agents (b) Business Organization (c) Business Owner (d) Business Partner	I	CO1
1C3	_____ is a type of business that is owned, managed and controlled by an individual. (a) Business Deals (b) Limited Liability (c) Sole Proprietorship (d) All the above	II	CO1
1C4	The _____ organization, management and control are associated with a single individual. (a) Joint firm (b) Partnership (c) Both (a) and (b) (d) Sole trader	I	CO1
1C5	The winding up of a partnership is usually referred to as, (a) Dissolution (b) Solution (c) Revolution (d) Resolution	I	CO1
1C6	The capital of a company is determined by _____ (a) Debenture capital (b) Long term capital (c) Short term capital (d) Both (b) and (c)	I	CO1

1C7	Equity shares are also known as _____ (a)Deferred shares (b)Preference shares (c)Ordinary shares (d)Both (a) and (b)	I	C01
1C8	Who is the father of Economics? (a)Max Muller (b)Adam Smith (c)Karl Max (d)None of the above	I	C01
1C9	Indian Economy is, (a)Socialist economy (b)Gandhian economy (c)Mixed economy (d)Free economy	I	C01
1C10	Multiple process in economic theory is conventionally taken to mean _____ (a)The manner in which prices increases (b)The manner in which banks create credit (c)The manner in which government expenditure increase (d)Income of an economy grows an account of an initial investment	III	C01
1C11	The book which is at the center price of the study of macroeconomics was written by, (a)Prof. J.M. Keynes (b)Prof. Benham (c)Prof. Samuelson (d)Prof. Baumol	I	C01
1C12	Which branch of economic studies about unemployment, illiteracy, national income tax? (a)Micro economics (b)Macro economics (c)Wealth economics (d)Fiscal economics	I	C01
1C13	The business economic theory is concerned with the management techniques to achieve _____ (a)Maximization of total revenue from sales (b)Maximization of cost of production (C)Maximize profit from the business unit (d)All the above	II	C01
1C14	Which of the following are concepts of national income, (a)Gross National product (b)Net National Product (c)Per Capita Income (d) All the above	I	C01
1C15	Multidisciplinary nature of business economics deals as, (a)Mathematics (b)Accounting (c)Statistics (d) All the above	II	C01

	FILL IN THE BLANKS ½ MARK QUESTIONS	BT Level	Course Outcome
1F1	Business Economics mainly deals with the _____ behavior of the firm.		C01
1F2	In Economics, resources are scarce, but _____ are limited		C01
1F3	Micro Economics is also called as _____.		C01
1F4	_____ is a work related to production, buying, selling of goods and services		C01
1F5	_____ is a single person, owns, manages and controls all the activities of the business.		C01
1F6	According to the partnership act, partnership is a relationship between _____ who have agreed to share the profits of the business carried on by all or any of the acting of all.		C01
1F7	A _____ is an artificial person, created by law with a fixed capital divisible into transferable succession and common seal.		C01
1F8	A company which controls another company is called _____.		C01
1F9	_____ is a source of capital requirement for a period of more than 5 to 20 years.		C01
1F10	Short-term source of finance is also known as _____.		C01
1F11	The goal of _____ provides safety nets in the economy like unemployment, insurance, disaster relief programs.		C01
1F12	Micro economics is concerned with the study of _____.		C01
1F13	Managerial Economics is concerned with the application of _____ and _____ to business.		C01
1F14	The fluctuations in the economic activities are called _____.		C01
1F15	The market value of all final goods and services produced in a country in a year is called _____.		C01
	MATCH THE FOLLOWING 1 MARK QUESTIONS	BT Level	Course Outcome
1M1.	Match the following: (A) Business Economics 1) Study of Individual unit (B) Micro 2) Micro and Macro Economics (C) Macro 3) Managerial Economics (D) Ragner Frisch 4) Economy as Whole		
1M2	Match the following: (A) Limited Liability Company 1) DI = PI - Direct Taxes (B) Net National Product 2) Artificial Company (C) Disposable Income 3) GDP = C+I+G+NX (D) Gross Domestic Product 4) NNP = GNP - Depreciation	1	C01
1M3	Match the following; (A) Expanction 1) Lowest Point (B) Recession 2) Small rise (C) Depression 3) Highest point (D) Recovery 4) Small fall	1	C01
1M4	Match the following; (A) Business 1) Individual (B) Adam Smith 2) Profit (C) Sole proprietorship 3) Agreement between two or more persons (D) Partnership 4) Father of Economics	1	C01

1M5	Match the following; (A) Profit Maximization Theory 1) maximization of sales revenue (B) Baumol's Theory of Sales Revenue Maximization 2) satisfactory behavior (c) Marris's theory of Growth Maximization 3) Profit = Total revenue – total (D) Behavioral Theories 4) balanced growth of the firm	1	C01
	5 MARKS QUESTIONS	BT Level	Course Outcome
1.	Define structure of business firm ?	V	C01
2.	Classify theory of firm?	IV	C01
3.	Classify types of business entities?	II	C01
4.	Describe about partnership deed?	II	C01
5.	Discuss a short note on a joint stock company?	I	C01
6.	What are the sources of raising capital?	II	C01
7.	Explain about sources of raising short term Capital?	V	C01
8.	What are non-conventional sources of finance?	III	C01
9.	Write about the significance of economics?	III	C01
10.	Estimate micro and macroeconomics of present scenario of Indian companies.	II	C01
11.	Explain about national income and concepts of national income	I	C01
12.	What is inflation and write the features of inflation and types of inflation?	II	C01
13.	What is the business cycle and write about the Tata company business cycle.	II	C01
14.	Write the nature and scope of business economics?.	VI	C01
15.	Evaluate the role of a business economist?	I	C01

Unit-II : MICRO SMALL AND MEDIUM ENTERPRISES

	OBJECTIVE TYPE QUESTIONS ½ MARK QUESTIONS	BT Level	Course Outcome
1.	The shape of the demand curve is____. (a)downward sloping (b) upward-sloping (c)vertical (d) horizontal	I	C02
2.	When the restaurant that serves fast food increases in the number, this leads to____. (a)An increase in fast-food meal supply (b)the growth in fast-food meal demand (c)a growth is seen in the demand for substitutes for such meals (d)increase in the rate of such meals	I	C02

3.	Many of the supply curve___ due to increases in marginal cost. (a)is vertical (b)is horizontal (c)has a positive slope (d)has a negative slope	I	C02
4.	What will be the supply when the price change is by 1%, and the change in supply is by 2%? (a)indeterminate (b)elastic (c)inelastic (d)static	I	C02
5.	What will happen if the rate of complementary goods has a downfall or there's an increase in consumer income? (a)the products demand curve shifts towards the right (b)the products supply curve shifts toward the right (c)the products supply curve shifts toward the right (d)the products demand curve shifts towards the right	I	C02
6.	The relation of _____ is by the law of demand. (a)the quantity and price of commodity (b)the price and income of commodity (c)demand quantity and demand-supply of commodity (d)income and demand quantity of a commodity	III	C02
7.	When the total revenue from product and the price moves in the same direction, then the demand is_____. (a)elastic (b)perfectly elastic (c)unrelated (d)inelastic	I	C02
8	The supply curve will be___ when the supply elasticity is greater than one. (a)horizontal (b)vertical (c)touching y-axis (d)passing through the origin	I	C02
9	Without changing the price___ moves to a rise in commodity supply. (a)fall in the supply (b)decrease in the supply (c)the rise in the supply (d)expansion in the supply	I	C02
10	Out of these scenarios, which won't lead to a demand change for the product? (a)a switch in consumer taste (b)increase in consumer income (c)changes in the price (d)none of these	I	C02
11	The demand curve that's horizontal and parallel to the x-axis shows the elasticity of demand to be____. (a)infinite (b)zero (c)greater than zero (d>equals to one	I	C02

12	27. Which of these doesn't lead to a change in the demand curve? (a)advertisement (b)price of product (c)income (d)related product price	I	C02
13	An increase in income in the countries that are developing leads the curve of demand shift to ____. (a)up (b)down (c)left (d)right	I	C02
14	Coffee and tea are ____ types of goods. (a)complimentary (b)substitute (c)normal (d)inferior	I	C02
15	Mention the responsible factor in demand for any natural resource? (a)increase in human population (b)scientific advancement (c)environmental pollution (d)use of biodegradable resources	II	C02
	FILL IN THE BLANKS ½ MARK QUESTIONS	BT Level	Cour se Outco me
1.	Demand is the _____, _____, and _____ to buy a product.	II	C02
2.	_____ refers to predicting consumer future demand for a product.	II	C02
3.	_____ a list that shows the various quantities demanded of a particular product at all prices that might prevail in the market at a given time.	I	C02
4.	The graphical representation of the demand schedule _____. ----	II	C02
5.	Demand curves are always _____ sloping.	I	C02
6	According to the law of demand, when price goes up, demand goes ____ and when price goes _____, demand goes up.	I	C02
7	A change in quantity demanded results in movement _____ the demand curve Along.	II	C02
8	A change in _____ results when people are willing to buy different amounts of the product at the same prices.	II	C02
9	The demand forecasting which can be done during a time period of one year is called _____.	I	C02
10	A left shift in the demand curve indicates a _____ in demand.	I	C02
11	Coffee and Tea work as _____ for one another. an _____ in the price of one lead to an _____ in demand for the other.	I	C02
12	The way people think about the future and make decisions is called a _____ ____ _____ which can influence the demand curve.	I	C02
13	Prices and quantities are said to have a direct relationship because they move in the _____ direction.	I	C02
14	The supply curve is always _____ sloping.	I	C02
15	A _____ shift indicates an increase in supple and a _____ shift indicates a decrease in supply.	I	C02
	MATCH THE FOLLOWING1 MARK QUESTIONS	BT Level	Cours e

			Outcome
1.	Match the Following; a) Demand Curve 1) Unlimited b) Price Determination 2) Downwards c) No. of buyers and sellers 3) Interplay of Market forces d) wants 4) Perfect	1	C02
2.	Match the following; a) Demand 1) Desire to purchase b) Demand is said to Exist 2) Desire for an Object c) Law of Demand Relationship between 3) Giffen Paradox d) Exception to Law of Demand 4) Price and Quantity	1	C02
3.	Match the following; a) Elastic Demand 1) Fruits, Meat Vegetables b) In Elastic Demand 2) Cheap Goods or Ordinary Goods c) Perishable Goods 3) Small Change in Price, Big Change in Quantity (d) Inferior Goods 4) Big Change in Price Small Change in Quantity	1	C02
4.	Match the following; a) Demand Forecasting 1) sales force opinion (b) Survey Methods 2) Trend line by observation (c) Statistical method 3) Predicting or expecting (d) Supply Graph 4) Short run Forecasting	1	C02
5.	Match the following; a) Determinants of Supply 1) Price of Something goes up b) Law of Supply 2) Relationship between supply and price c) Supply curve or Supply Schedule 3) Upward Sloping d) Supply Graph Shows 4) Cost of Inputs or factors	1	C02
5 Marks Questions			
1	What is Demand Analysis? Explain Demand Functions.	II	C02
2.	Define Law of Demand?	II	C02
3.	What are the Law of Demand Exceptions?	II	C02
4.	Explain the determination of Demand.	III	C02
5.	Define Elasticity of Demand and Types of Elasticity of demand.	V	C02
6.	Describe the measurement of Elasticity of Demand.	V	C02
7.	Discuss the elasticity of Demand in Decision Making.	VI	C02
8.	What is demand forecasting?	II	C02
9.	Explain Characteristics of good Demand Forecasting.	I	C02
10.	What are the steps in Demand Forecasting	VI	C02
11	Classify the Methods of Demand Forecasting.	I	C02
12	Discuss the Factors governing Demand Forecasting.	I	C02
13	Explain the Determination of Supply.	I	C02
14	What are the Supply factors?	II	C02
15	Explain the Law of Supply.	I	C02

Unit - III : IDEA GENERATION AND FEASIBILITY ANALYSIS

**OBJECTIVE TYPE QUESTIONS
½ MARK QUESTIONS**

**BT
Level**

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Outco
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S.No. MULTIPLE CHOICE QUESTIONS

BT Level

Course
Outcome

3C1 How many types of production function there are
(a) Three Types
(b) Four Types
(c) Six Types
(d) Two Types

[]

I

CO32
023-
24

3C2 The cost of one thing in terms of the alternative give up is called ____
A) Red Cost B) Production Cost
C) Physical cost D) Opportunity Cost

3C3 Factor of production are,
(A) Inputs into the production process
(B) Weather, social and political conditions that affect production.
(C) The physical relationships between economic inputs and outputs.
(D) The mathematical calculations firms make to determine production.

3C4 The opportunity cost of an item is,
(B) The number of hours needed to earn money to buy it.
(B) What you give-up to get that item.
(C) Always less than the rupees value of the item.
(D) Always equal to the rupees value of the item.

3C5 In which of the following market structure is the degree of control over the price of its product by a firm very large?
A) Imperfect competition B) perfect competition
C) Monopoly D) (A)n and (B)

3C6 Production function is also known as,
A) Input-cot relationship B) Input-output relationship
C) Output-input relationship D) Output-cost relationship

3C7 Production function can be divided into _____stage.
A) Two B) Three
C) Four D) Five

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II

CO3

3C8 Which of the following is a factor affecting production?
(A) Fixed inputs. (B) Variable inputs.
(C) Technology. (D) All of the above.

[]

I

CO3

3C9 Under __ price is determined by the interaction of total demand and total supply in the market.
(A) Perfect competition. (B) Monopoly.
(C) Imperfect competition. (D) All of the above.

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CO3

3C10 Under the perfect competition, price is determined by the interaction of

[]

I

CO3

	total demand and _____. (A) Total supply. (B) Total cost. (C) Total utility. (D) Total production.			
3C11	Oligopoly is a type of ___ Market. A ___ exists in the industry. A) Perfect, few firms (B) Imperfect, few firms C) Perfect many firms (D) Imperfect, many firms	[]	I	C03
3C12	A firm in monopolistic competition increases its expenditure on marketing its product. What will it not be able to achieve as a result? (A) A higher selling price. (B) A more differential product. (C) A higher long-run profit. (D) A more inelastic demand.	[]	I	C03
3C13	What are the factors of production. A) Land, Labour (B) Enterprise C) Capital (D) All the Above	[]	I	C03
3C14	Which of the following are the characteristics of break-even point? A) There is no loss and no profit to the firms B) Total revenue is equal to total cost C) Contribution is equal to fixed cost D) All the above	[]	I	C03
3C15	Break even analysis refers to the study of _____ analyses. A) Cost volume profit B) Cost output profit B) Cost input expenses D) Cost price margin	[]	I	C03

Unit - III Production and Cost Analysis

OBJECTIVE TYPE QUESTIONS ½ MARK QUESTIONS

BT Level

	FILL IN THE BLANKS (½ MARK QUESTIONS)	BT Level	Course Outcomes
1.	_____ is the transformation of input into the output of commodity In a specific period of time at the given state of technology.	I	C03
2.	The maximum quantity of a goods or services that can be produced by a set of input is considered as _____.	IV	C03
3.	_____ refers to the cost per unit of output assuming het production of each unit of output incurs the same cost.	II	C03
4.	The cost of best alternative foregone is called _____.	I	C03
5.	When the production volume increases then the _____ also increases.	II	C03
6.	_____ is a market structure in which product or commodity is homogeneous.	I	C03

7	When average cost begins to rise, marginal cost is _____ homogeneous.	I	C03
8	The _____ cuts through the lowest point of average variable and average total cost curves.	I	C03
9	_____ are the cost that do not vary with the changes in output.	I	C03
10	_____ is the important form of Imperfect competition.	I	C03
11	_____ refers to a situation where there are many sellers of a differential product.	I	C03
12	_____ refers to the study of cost volume profit analysis.	II	C03
13	_____ is concerned with the determination of particular volume at which firm's cost will be equal to its revenues profit.	I	C03
14	The point of no profit or no loss is determined as _____.	II	C03
15	_____ examines the interactions of a firm's sales volume, selling price, cost structures and profitability.	I	C03
MATCH THE FOLLOWING 1 MARK QUESTIONS		BT Level	Course Outcome
1.	Match the following; A) Production B) Isoquant C) Production Function D) Cobb-Douglas	1) $Q = f(L_1, L_2, C, O, T)$ 2) $Q = aL^b K^c$ 3) Downward Sloping 4) Input into output	1 C03
2.	Match the Following; A) Cost B) Outlay cost C) Total Cost D) Marginal cost	1) Labour, Material, Plant 2) Fixed cost and Variable cost 3) Expenditure 4) Additional unit of output	1 C03
3.	Match the following; A) LAC B) AVC C) SAC D) ATC	1) Short Run Average Cost 2) Average Total Cost 3) Long Run Average Cost 4) Average Fixed Cost	a) 1 C04
4.	Match the following; A) Market and sellers B) Perfect Competition C) Monopoly D) Oligopoly	1) A large number of buyers 2) Single Seller 3) Few Sellers 4) Is a Place	a) 1 C04
5.	Match the following; A) Competition based pricing B) Demand based pricing C) Strategy based pricing D) Cost based pricing	1) Skimming Pricing 2) Full cost pricing 3) sealed bid pricing 4) Price Discrimination	a) 1 C04

5 MARKS QUESTIONS

1.	Write the factors of production and explain it briefly.	I	C03												
2.	Explain production function with one-variable input.	I	C03												
3.	What is the difference between monopolistic competition and pure competition?	III	C03												
4.	Distinguish between short and long run cost function.	I	C03												
5.	Explain about Break Even Analysis.	III	C03												
6.	Describe about monopolistic competition and Oligopoly with example.	I	C03												
7.	Write the product life cycle based on pricing?	II	C03												
8.	Explain Return to Scale.	II	C03												
9.	Write the Short Run and Long Run Cost Function.	I	C03												
10.	Explain Pricing methods.	I	C03												
11.	From the following data, Calculate, A) P/V Ratio B) Profit when sales are Rs.20000 Fixed expenses Rs.4000, Break-even point Rs.10000	VI	C03												
12.	What are the features of perfect competition.?	I	C03												
13.	Srikanth Enterprises deals in the supply of hardware parts of computer. The following cost data is available for two successive periods. <table style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th></th> <th>YEAR I (Rs)</th> <th>YEAR II (Rs)</th> </tr> </thead> <tbody> <tr> <td>Sales</td> <td>50000</td> <td>120000</td> </tr> <tr> <td>Fixed costs</td> <td>10000</td> <td>20000</td> </tr> <tr> <td>Variable cot</td> <td>30000</td> <td>60000</td> </tr> </tbody> </table> Determine: 1.Break -even point, 2.Margin of safety		YEAR I (Rs)	YEAR II (Rs)	Sales	50000	120000	Fixed costs	10000	20000	Variable cot	30000	60000	I	C03
	YEAR I (Rs)	YEAR II (Rs)													
Sales	50000	120000													
Fixed costs	10000	20000													
Variable cot	30000	60000													
14.	What is monopoly and explain with example?	I	C03												
15.	Explain about cost volume profit analysis with example.	II	C03												

UNIT-IV : FINANCIAL ACCOUNTING

UNIT-IV : FINANCIAL ACCOUNTING			
	OBJECTIVE TYPE QUESTIONS ½ MARK QUESTIONS	BT Level	Course Outcome
1.	Which of the following statement is correct? a) Assets – Capita = Liabilities b) Liabilities + Assets = Capital c) Liabilities + Capital = Assets d) Assets – Liabilities = Capital	I	C04
2.	_____ Account is a capital means of controlling the stock at branch a) Brach accounts b) Expenses account c) Expense account d) None of the above	I	C04
3.	The system of keeping incomplete record is knowns as, a) Single entry b) Double entry c) Dual entry d) None of the above	II	C04
4.	Under single entry system sales are computed by adding_____ a) Cash sales and cash received from debtors. b) Cash sales and credit sales. c) Credit sales and cash received from debtors. d) None of the above.	I	C04
5.	Profit as per accounts from incomplete records may be construed as equivalent of, a) Excess of asset over liabilities at close of period. b) Excess of capital at the end over the capital at beginning. c) Excess of asset over liabilities at the commencement of period. d) Excess of capital at the beginning over capital at the end.	I	C04
6.	Accounting concepts include certain basic_____ a) Account. b) Transactions. c) Assumptions. d) None of these.	II	C04
7.	Accounting equation is developed with the help of, a) Money measurement concept. b) Dual aspect concept. c) Revenue realization concept: d) Historical cost concept.	I	C04

8	Accounting principles are based on, a) Convenience in accounting. b) Objectivity. c) Subjectivity. d) Practicability.	II	C04
9.	Normally assets are recorded at cost price. This is because of, (a) Going concern concept (b) Historical concept. (c) Both concepts. (d) None of these.	II	C04
10	The amount of cash received from debtors can be computed from either from the cash book. (a) Bills receivable A/c. (b) Debtors A/c. (c) Balance sheet. (d) None of these.	I	
11	Only personal accounts are kept in ____ system (a) Pure single-entry system. (b) Simple single-entry system. (c) Quasi single entry system. (d) None of these.	I	C04
12	Profit is only an estimate in this system. (a) Nominal system. (b) Double entry system. (c) Single entry system. (d) None of these.	I	C04
13	The comparison of one accounting period with that of the past is possible when one of the concepts given is followed, (a) Cost. (b) Consistency. (c) Going concern. (d) Matching.	I	C04

14	Sales + Closing stock - Purchases (a) Purchases returns. (b) Sales returns. (c) Cost of goods sold. (d) Opening stock.	I	C04
15	Transaction between branches is called____ (a) Inter Branch Transaction. (b) Branch transaction (c) Internal Branch (d) None of these	I	C04
	FILL IN THE BLANKS ½ MARK QUESTIONS	BT Level	Course Outcom e
1.	____are the amounts of cash or other assets taken by the owner from the business for personal use.	I	C04
2.	The excess of current assets over current liabilities is called____	I	C04
3.	_____is the process which provides information needed as a basis of making business decisions.	II	C04
4	_____are assets which are purchased for permanent use in the business.	I	C04
5.	_____accounts have their existence even after the close of accounting year.	I	C04
6	Balance sheet is a statement of assets and _____ of a business.	I	C04
7	Balance sheet is prepared to know the _____of a business entity.	I	C04
8	Current assets are more liquid than ____ assets.	I	C04
9	Current liabilities are liabilities that are payable within_____	I	C04
10	The claims of creditors against the assets of a business are said to be_____	II	C04
11	Assets those can be converted into cash within one year of the operating cycle are called_____	I	C04
12	Two types of transactions are_____	II	C04
13	Recording two aspects of each transaction is known as _____system.	I	C04
14	The difference between assets and liabilities represents_____	II	C04
15	____is the interest of owners in a business.	I	C04
	MATCH THE FOLLOWING 1 MARK QUESTIONS	BT Level	Course Outcome
1.	Match the following; A) Creditors 1) Who manages the Business B) Managers 2) Lenders C) Proprietor 3) Goods withdrawn from the business D) Drawings 4) Owners	I	C05
2.	Match the following; A) Accounting 1) Verification of the books of account B) Book keeping	I	C05

	<p>2) Interested in buying the shares</p> <p>C) Auditing</p> <p>3) Wider scope</p> <p>D) Drawings</p> <p>4) It has limited scope</p>		
3.	<p>Match the following;</p> <p>A) Personal Account</p> <p>1) Liabilities + Equity</p> <p>B) Nominal Account</p> <p>2) HMT Ltd A/C</p> <p>C) Real Account</p> <p>3) Salaries A/C</p> <p>D) Assets</p> <p>4) Furniture A/C</p>	I	C05
4.	<p>Match the following;</p> <p>A) Assets-Liabilities</p> <p>1) Contains various accounts</p> <p>B) Journal</p> <p>2) Records credit sales</p> <p>C) Sales book</p> <p>3) A day book</p> <p>D) Ledger</p> <p>4) Owners equity</p>	I	C05
5.	<p>Match the following;</p> <p>A) RBC</p> <p>1) Sales- sales returns</p> <p>B) All Assets</p> <p>2) Reserve for Bad Debt</p> <p>C) All Liabilities</p> <p>3) Debit Balance</p> <p>D) Net Sales</p> <p>4) Credit Balance</p>	I	C05

5 MARKS QUESTIONS

1	Write the accounting concepts?	I	C04
2	Explain the accounting conventions.	I	C04
3	Classify the accounting equations.	II	C04
4	Write the double entry book keeping system in accounting?	I	C04
5	Explain the rules for maintaining books of accounts.	I	C04
6	What is journal and explain the procedure to follow then posting journal.	I	C04
7	<p>Write the journal entries for following transactions</p> <p>Date (2019)</p> <p>March 1 Mr. Ganesh commenced business with cash of RS. 90000</p> <p>March 2 Purchased a computer for office use for cash Rs.10000</p> <p>March 4 Bought goods from Shankar for Rs.8000</p> <p>March 5 Sold goods to Naresh for cash Rs.12000</p> <p>March 8 Purchased goods for cash Rs.5000 from Suresh</p> <p>March 9 Sold goods on credit to Mahesh Rs.15000</p> <p>March 11 Paid for printing expenses Rs.900</p> <p>March 13 Goods returned to Shankar on account Rs.600</p> <p>March 14 Cash Sales Rs.18000</p> <p>March 15 Wages paid Rs.3000</p>	II	C04

	March 17 Mahesh returned goods Rs.2000 March 18 Paid to Shankar Rs.3400 on account March 20 Received from Mahesh on account Rs.7000 March 23 Rent paid Rs.1500 March 25 Commission received Rs.1200 March 28 Paid Salaries Rs.5000 March 30 Ganesh taken Rs.1000 for personal expenses March 31 Goods taken for personnel use Rs.800		
8	Write the journal entries for following transactions Date 2019 Jan 1 Mr. Ram commenced business with Rs.98000 Jan 2 Cash deposited into state bank of India Rs.50000 Jan 4 Purchased office furniture for Rs.10000 paid through bank Jan 5 Purchased goods from Amar Rs.12000 Jan 7 Purchased goods for cash Rs.5000 from Ramesh Jan 8 Cash Sales Rs.11000 Jan 10 Goods sold to Akbar for Rs.10000 Jan 12 Paid rent by cheque Rs.4000 Jan 14 Paid to Amar Rs.6000 on account Jan 15 Goods returned by Akbar Rs.1000 Jan 16 Goods returned to Amar Rs.15000 Jan 18 Paid for advertising Rs.1200 Jan 19 Received from Akbar by cheque Rs.3000 Jan 21 Loan taken from Raju Rs.9000 Jan 25 Goods purchased for Rs.15000, paid by cheque Jan 28 Drawings from bank by Ram Rs.1500 Jan 31 Salaries paid by cheque Rs.12000	I	C04
9	Enter the following transactions in Journal and post them into Ledger. 1. Entertainment expenses Rs.1000 2. Madhu commenced business with cash Rs.100000 3. cheque deposited in bank Rs.2000	VI	C04
10	Enter the following transactions in Journal and post them into Ledger. 2017 Jan 1 Mr. Ramesh started business with cash Rs.1,00,000 Jan 2 He purchased furniture for Rs.20,000 Jan 3 He purchased goods for Rs.60,000 Jan 5 He sold goods for cash Rs.80,000 Jan 6 He paid salaries Rs.10,000	I	C04
11		I	C04
12	Prepare final account from the following balance sheet.	II	C04

Particulars	Debit	Credit
Furniture	640	-
Building	6250	-
Plant and Machinery	7500	-
Stock	3400	-
Purchases	6000	-
Advertising	1000	-
Cash	1200	-
Salaries	3000	-
Insurance	800	-
Debtors	2000	-
Capital	-	12500
Sales	-	15000
Creditors	-	4290
Total	31790	31790

Adjustments:

- 1) Closing stock 2000
- 2) Depreciation on Building @5%
- 3) Salaries Outstanding Rs.300
- 4) Insurance Prepaid Rs.100

13 Prepare final account from the following balance sheet.

I

C04

PARTICULARS	DEBITORS	CREDITORS
Cash in hand	3000	--
Purchases	40000	--
Sales Returns	500	--
Wages	5000	--
Salaries	3200	--
Opening Stock	22000	--
Carriage inward	800	--
Carriage outward	1200	--
Buildings	25000	--
Machinery	15000	--
Insurance	700	--
Sundry Debtors	8000	--
Bills Receivables	5600	--
Capital	--	50000
Sales	--	72000
Purchase Returns	--	300
Creditors	--	4000
Bills Payables	--	3700
Total	130000	130000

Adjustments:

- 1) Closing Stock 26000
- 2) Outstanding Salaries 550
- 3) Bad debts 600
- 4) Provision for Bad Debts @5%
- 5) Prepaid Insurance 200
- 6) Depreciation on Machinery 700
- 7) Depreciation on Building 1200

14 What is Trial Balance and explain format of Trial balance?

I

C04

15			VI	C04
	a) Write the format of Trial Balance . b) Prepare a trial balance as on 31-12-214 from the below information			
	Particulars	Rs	Particulars	Rs
	Sundry Debtors	32000	Bills Payable	7500
	Stock	22000	Purchases	218870
	Cash in hand	35	Cash at bank	1545
	Plant and machinery	17500	Sundry creditors	10650
	Trade expenses	1075	Sales	234500
	Salaries	2225	Carriage outward	400
	Stock	900	Discounts (Dr)	1100
	Capital	79500	Premise	34500

UNIT V : Ratio Analysis			
	OBJECTIVE TYPE QUESTIONS ½ MARK QUESTIONS	BT Level	Course Outcome
1.	Determine stock turnover ratio if, opening stock is Rs. 31,000, Closing stock is 29,000, Sales is 3,20,000 and Gross profit ratio is 25% on sales. (a) 31 times. (b) 11 times. (c) 8 times. (d) 32 times.	V	C05
2.	Determine Debtors turnover ratio if, closing debtors is Rs 40,000, Cash sales is 25% of credit sales and excess of closing debtors over opening debtors is Rs 20,000. (a) 4 times. (b) 2 times. (c) 6 times. (d) 8 times.	V	C05
3.	Quick ratio is 1.8:1, current ratio is 2.7 1 and current liabilities are 60,000. Determine value of stock. (a) 54,000 (b) 60,000 (c) 1,62,000 (d) None of the above.	V	C05
4.	Which of the following is not included in current assets? (a) Debtors. (b) Stock. (c) Cash at bank. (d) Cash in hand.	I	C05
5.	Collection of debtors, (a) Decreases current ratio. (b) Increases current ratio. (c) Has no effect on current ratio. (d) None of the above.	I	C05
6.	Higher the ratio, the more favorable it is, doesn't stand true for, (a) Operating ratio. (b) Liquidity ratio. (c) Net profit ratio. (d) Stock turnover ratio.	I	C05

7.	<p>Liquid assets are determined by,</p> <p>(a) Current assets - Stock - Prepaid expenses</p> <p>(b) Current assets + stock + prepaid expenses</p> <p>(c) Current assets + Prepaid expenses</p> <p>(d) None of the above.</p>	V	C05
8.	<p>Debt-equity ratio is a sub-part of,</p> <p>(a) Short-term solvency ratio.</p> <p>(b) Long-term solvency ratio.</p> <p>(c) Debtors' turnover ratio.</p> <p>(d) None of the above.</p>	I	C05
9.	<p>Current ratio is stated as a crude ratio because,</p> <p>(a) It measures only the quantity of current assets.</p> <p>(b) It measures only the quality of current assets.</p> <p>(c) Both a and b.</p> <p>(d) Offerings dimension.</p>	II	C05
10	<p>Which ratio is considered as safe margin of solvency?</p> <p>(a) Liquid ratio.</p> <p>(b) Quick ratio.</p> <p>(c) Current ratio.</p> <p>(d) None of the above.</p>	I	C05
11	<p>Working capital turnover ratio can be determined by,</p> <p>(a) (Gross Profit/Working capital)</p> <p>(b) (Cost of goods sold/Net sales)</p> <p>(c) (Cost of goods sold/Working capital)</p> <p>(d) None of the above.</p>	I	C05
12	<p>Stock velocity establishes a relationship between.</p> <p>(a) Cost of goods sold in a given period and the average amount of inventory held during that period.</p> <p>(b) Cost of goods sold in a given period and the average amount of stock held during that period.</p> <p>(c) Both a and b.</p> <p>(d) None of the above.</p>	IV	

13	<p>While calculating Earnings per share, if both equity and preference share capitals are there, then,</p> <p>(a) Preference share is deducted from the net profit.</p> <p>(b) Equity share capital is deducted from the net profit.</p> <p>(c) Both a and b.</p> <p>(d) None of the above.</p>	I	
14	<p>Net operating profit ratio determines _____ net profit ratio determines.</p> <p>(a) Overall efficiency of the business, working efficiency of the management.</p> <p>(b) Working efficiency of the management, overall efficiency of the business.</p> <p>(c) Overall efficiency of the external market, working efficiency of the internal management.</p> <p>(d) None of the above.</p>	V	
15	<p>The relationship between two financial variables can be expressed in,</p> <p>(a) Pure Ratio.</p> <p>(b) Percentage.</p> <p>(c) Rate or time.</p> <p>(d) Either of the above.</p>	VI	

FILL IN THE BLANKS QUESTIONS		BT Level	Course Outcome
1.	_____ Balance sheet items are expressed in the ratio of each asset to total assets and Ratio of each liability to total liability.	1	C05
2.	_____ analysis is a technique of studying several financial statements over a series of years.	1	C05
3.	Debt equity Ratio = _____	1	C05
4.	_____ Ratio measures the long-term obligation of a firm."	1	C05
5.	Leverage Ratio is also known as _____ Ratio.	1	C05
6	_____ Ratio is calculated to test the long-term financial position of a firm.	1	C05
7	_____ = Equity share capital + Reserve and Surpluses Preference share capital + Long term debt bearing fixed interest.	1	C05
8	_____ measure the efficiency or effectiveness with which a firm manages its resources.	1	C05
9	The main purpose of _____ Ratio is to measure the ability of the firm to pay its current liabilities.	1	C05
10	_____ are those assets which can be converted into cash within a short period i.e., not exceeding one year.	1	C05
11	_____ provide clues to the financial position of a concern.	1	C05
12	The term _____ means ability of a concern to meet its long-term obligations.	1	C05
13	_____ Ratio assesses the overall efficiency of the business concern.	1	C05
14	A statement where balance sheet items are expressed in the ratio of each asset to total assets and the ratio of each liability is expressed in the ratio of total liabilities is called_____.	1	C05
15	_____ ratio establishes a relationship between net credit sales and average account receivables i.e., average trade debtors and bill receivables.	1	C05
MATCH THE FOLLOWING 1 MARK QUESTIONS		BT Level	Course Outcome
1.	Match the following; A) Cost of goods sold 1) Return on Investment B) PBIT profit 2) Sales gross C) ROI 3) Quick Assets/Current Liabilities D) Quick Ratio 4) Profit before interest and Tax	1	C06
2.	Match the following; A) Gross Profit Ratio 1) Funds from operations B) Cash in hand 2) Current Liability C) Short- Term Loans 3) Current Asset D) FFO 4) Gross profit/Net sales	1	C06
3.	Match the following; A) Purchase of Land 1) Current Liability B) Issue of Capital 2) CA-CL C) Working Capital 3) Application of funds D) Outstanding Expenses 4) Sources of funds	1	C06
4.	Match the following; A) Ratios is 1) Bills Payables, Creditors B) Current Assets 2) Debtors, Cash at Bank, Cash in Hand C) Current Liabilities 3) Financial Analysis D) Quick Assets 4) Cash in Hand, Cash at Bank	1	C06

5.	Match the following; A) Inventory Turnover Ratio also called B) Capital Structure ration are also called C) ROI D) P/E Ratio	1) Leverage Ratio 2) Stock Turnover Ratio 3) Market value of share 4) ROCE	1	C06
	5 MARKS QUESTIONS		BT Level	Course Outcome
1.	Write the concepts of Ratio analysis.		I	C05
2.	Write the Importance of Ratio analysis in present scenario of companies.		I	C05
3.	What are leverage Ratios?		I	C05
4.	What is Ratio Analysis? Explain its Classifications.?		I	C05
5.	What are proprietary Ratios?		I	C05
6.	<p>A) Calculate net profit Ratio from the following data.</p> <p>1)Net Sales Rs.50000 2)Cost of goods sold Rs.20000 3)AdministrativeExpenses Rs.3000 4)Selling and Distribution expenses Rs.4000 4)Loss on sale of fixed assets Rs.3000 5)Interest on Incestment recevied Rs.2000 6)Tax 20%</p> <p>B) Compute Inventory Ratio and also the Inventory Holding Period.</p> <p>A firm sold goods worth Rs. 5,00,000 and its gross profit is 20% of slaes value.The inventory at the beginning of the year was Rs.16,000 and at end of the year was 14,000.</p>		III	C05
7.	From the Balance Sheet of XYZ Co. Ltd., Calculate Liquidity Ratios.		III	C05
	Capital and Liabilities	Amount	Assets	Amount
	Preference shares capital	100	Land and Building	225
	Equity shares capital	150	Plant and Machinery	250
	General Reserve	250	Furniture and Fixtures	100
	Debentures	400	Stock	250
	Creditors	200	Debtors	125
	Bills Payable	50	Cash at Bank	250
	Outstanding Expenses	50	Cash in Bank	125
	Profit and Loss Account	100	Prepaid Expenses	50
	Bank Loans (Long Term)	200	Markable Securities	125
		1500		1500
8.	What are the limitations ratio? Does Ratio analysis really measure the financial performance of a company?		I	C05
9.	Explain the Limitation of Ratio analysis		I	C05
10.	What is profitability Ratio?		I	C05

11	Briefly explain about turn over Ratios?	I	C05
12	How many types of Ratios are available?	I	C05
13	What is gross profit Ratio and net Profit Ratio?	I	C05
14	What are leverage Ratios?	I	C05
15	Explain about Solvency Ratios?	V	C05

MID QUESTION PAPERS
&
END SEMESTER QUESTION PAPERS

Duration: 2 Hrs

Dt: 24-03-2025, Day-1 (AN)

Max Marks: 30M

Blooms Taxonomy Levels : I-Remembering, II-Understanding, III-Applying, IV-Analyzing, V-Evaluating, and VI-Creating.

Course Outcomes: CO

Part – A (10 Marks)**SECTION A1: Answer All multiple choice questions.**

Marks: 10Qx1/2M = 5M

- | | | | |
|--|-----|----|-----|
| 1. To carry out any _____ and achieve its objective of earning profit is required to allocate resources and coordinate properly. | [] | I | CO1 |
| A)Business
C)Partnership | | | |
| B) Organization
D)Sole Proprietorship | | | |
| 2. The winding up of a partnership is usually referred to as,_____ | [] | II | CO1 |
| A)Dissolution
C)Revolution | | | |
| B)Solution
D)Resolution | | | |
| 3. Who is the father of Economics? | [] | I | CO1 |
| A)Max Muller
C)Karl Max | | | |
| B)Adam Smith
D)None of the above | | | |
| 4. Which of the following are concepts of national income? | [] | I | CO1 |
| A)Gross National product
C)Per Capita Income | | | |
| B) Net National Product
D) All the above | | | |
| 5. The shape of the demand curve is _____. | [] | I | CO2 |
| A)downward sloping
C)vertical | | | |
| B) upward-sloping
D) horizontal | | | |
| 6. The relation of _____ is by the law of demand. | [] | I | CO2 |
| A)the quantity and price of commodity
C)demand quantity and demand-supply of commodity
D)income and demand quantity of a commodity | | | |
| B)the price and income of commodity | | | |
| 7. When the total revenue from product and the price moves in the same direction, then the demand is _____. | [] | I | CO2 |
| A) elastic
C) unrelated | | | |
| B) perfectly elastic
D) inelastic | | | |
| 8. The demand curve that's horizontal and parallel to the x-axis shows the elasticity of demand to be _____. | [] | I | CO2 |
| A)infinite
B)zero | | | |
| C) greater than zero
D>equals to one | | | |
| 9. How many types of production function there are _____ | [] | I | CO3 |
| A) Three Types
C) Six Types | | | |
| B) Four Types
D) Two Types | | | |
| 10. Production function is also known as _____ | [] | II | CO3 |
| A) Input-cost relationship
C) Output-input relationship | | | |
| B) Input-output relationship
D) Output-cost relationship | | | |

P.T.O

SECTION A2: Answer All fill in the blank questions.**Marks: 6Qx1/2M = 3M**

11. Business Economics mainly deals with the _____ behavior of the firm I CO1
12. _____ is a single person, owns, manages and controls all the activities of the business. I CO1
13. The fluctuations in the economic activities are called _____. I CO1
14. Demand is the _____, _____, and _____ to buy a product. II CO2
15. The graphical representation of the demand schedule _____. I CO2
16. The maximum quantity of a goods or services that can be produced by a set of input is considered as _____. I CO3

SECTION A3: Answer All Match the following questions**Marks: 2Qx1M = 2M**

17.

1. Business Economics	A. Study of Individual unit
2. Micro	B. Micro and Macro Economics
3. Macro	C. Managerial Economics
4. Ragner Frisch	D. Economy as Whole

 I CO1
18.

1. Demand Curve	A. Unlimited
2. Price Determination	B. Downwards
3. Number of buyers and sellers	C. Interplay of Market forces
4. wants	D. Perfect

 I CO2

Part – B (20 Marks)**Answer any FOUR questions.****Marks: 4Qx5M = 20M**

19. Define structure of business firm. I CO1
20. Explain about partnership deed. V CO1
21. Explain micro and macroeconomics of present scenario of Indian companies. V CO1
22. Explain the Determination of Supply. II CO2
23. Classify the Methods of Demand Forecasting. IV CO2
24. Write the factors of production and explain it briefly. I CO3

COURSE OUTCOMES (CO's)

Academic Year: 2024-25

Class : II YEAR-II SEM.

Course Name : OPERATING SYSTEM (R22CSE2213)

At the end of the course, the student will be able to

C223.1	Understand Operating System structures and Process concepts. (Remember)
C223.2	Gain knowledge in scheduling algorithms and Deadlocks. (Apply)
C223.3	Demonstrate process management and synchronization. (Evaluate)
C223.4	Understand IPC between processes on single and different systems (Understand)
C223.5	Implement Memory and Virtual Memory Management techniques. (Apply)
C223.6	Explain how a simple file system organizes data in the hard disk. (Analyze)

COURSE ARTICULATION MATRIX

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C223.1	1	2	3	3	1	-	-	-	-	-	-	1	1	2	2
C223.2	1	2	2	2	3	1	-	-	-	-	-	-	1	2	2
C223.3	-	1	2	3	-	-	-	-	-	-	-	-	1	2	1
C223.4	1	2	2	2	2	1	-	-	-	1	-	-	-	1	1
C223.5	-	1	2	1	1	-	-	-	-	-	-	-	-	1	1
C223.6	-	1	2	3	1	-	-	-	-	-	-	-	1	2	1
C223	1	1.5	216	2.33	1.6	1	1	1	1	1	-	1	1	1.6	1.33

OPERATING SYSTEM

SYLLABUS

BR22 – B.TECH. – INFORMATION TECHNOLOGY

SRI INDU COLLEGE OF ENGINEERING & TECHNOLOGY

(An Autonomous Institution under UGC, New Delhi)

B.Tech. - II Year – II Semester

L	T	P	C
3	0	0	3

(R22CSE2213) OPERATING SYSTEMS

Course Objectives:

- Introduce operating system concepts (i.e., processes, threads, scheduling, synchronization, deadlocks, memory management, file and I/O subsystems and protection)
- Introduce the issues to be considered in the design and development of operating system
- Introduce basic Unix commands, system call interface for process management, interprocess communication and I/O in Unix

Course Outcomes:

- Will be able to control access to a computer and the files that may be shared
- Demonstrate the knowledge of the components of computers and their respective roles in computing.
- Ability to recognize and resolve user problems with standard operating environments.
- Gain practical knowledge of how programming languages, operating systems, and architectures interact and how to use each effectively.

UNIT - I

Operating System - Introduction, Structures - Simple Batch, Multiprogrammed, Time-shared, Personal Computer, Parallel, Distributed Systems, Real-Time Systems, System components, Operating System services, System Calls

Process - Process concepts and scheduling, Operations on processes, Cooperating Processes, Threads

UNIT - II

CPU Scheduling - Scheduling Criteria, Scheduling Algorithms, Multiple -Processor Scheduling, System call interface for process management-fork, exit, wait, waitpid, exec

Deadlocks - System Model, Deadlocks Characterization, Methods for Handling Deadlocks, Deadlock Prevention, Deadlock Avoidance, Deadlock Detection, and Recovery from Deadlock

UNIT - III

Process Management and Synchronization - The Critical Section Problem, Synchronization Hardware, Semaphores, and Classical Problems of Synchronization, Critical Regions, Monitors

Interprocess Communication Mechanisms: IPC between processes on a single computer system, IPC between processes on different systems, using pipes, FIFOs, message queues, shared memory.

UNIT - IV

Memory Management and Virtual Memory - Logical versus Physical Address Space, Swapping, Contiguous Allocation, Paging, Segmentation, Segmentation with Paging, Demand Paging, Page Replacement, Page Replacement Algorithms.

UNIT - V

File System Interface and Operations -Access methods, Directory Structure, Protection, File System Structure, Allocation methods, Free-space Management. Usage of open, create, read, write, close, lseek, stat, ioctl system calls.

TEXT BOOKS:

1. Operating System Principles- Abraham Silberchatz, Peter B. Galvin, Greg Gagne 7th Edition, John Wiley.
2. Advanced programming in the UNIX environment, W.R. Stevens, Pearson education.

REFERENCE BOOKS:

1. Operating Systems- Internals and Design Principles, William Stallings, Fifth Edition–2005,Pearson Education/PHI
2. Operating System A Design Approach- Crowley, TMH.
3. Modern Operating Systems, Andrew S. Tanenbaum 2nd edition, Pearson/PHI
4. UNIX programming environment, Kernighan and Pike, PHI/ Pearson Education
5. UNIX Internals -The New Frontiers, U. Vahalia, Pearson Education.



SRI INDU COLLEGE OF ENGINEERING & TECHNOLOGY
LESSON PLAN
(Regulation :R22)
DEPARTMENT OF INFORMATION TECHNOLOGY

**Prepared
on
Jan' 2025**

Sub. Code & Title **R22CSE2213 - Operating System**

Academic Year: 2024-25 **Year/Sem.** **II/II**

Faculty Name & Designation **Dr.P. EPSIBA Assoc. Professor**

Unit/ Item No.	Topic (s)	Book Referenc e	Page (s)		Teaching Methodolo gy	Propo sed No. of Period s	Actual Date of Handled	CO/RBT
			From	To				
UNIT-I (OPERATING SYSTEM)								8
1.1	Introduction	T1	3	6	Black Board	01		CO1,RB1
1.2	OS Structure –Simple Batch	T1	18	19	Black Board	01		CO1,RB2
1.3	Multi programmed, Time shared	T1	19	20	Black Board	01		CO1,RB2
1.4	Personal Computer, Parallel System	T1	13	16	Black Board	01		CO1,RB2
1.5	Distributed Systems, Real- Time	T1	30	33	Black Board	01		CO1,RB2
1.6	System Components	T1			Black Board	01		CO1,RB1
1.7	Operating System services	T1	49	52	Black Board	01		CO1,RB2
1.8	System Calls	T1	55	58	Black Board	01		CO1,RB1
1.9	Process and CPU Scheduling - Process concepts	T1	101	104	Black Board	01		CO1,RB2
1.10	Process Scheduling	T1	105	110	Black Board	02		CO1,RB1
1.11	Operation on Processes	T1	110	115	Black Board	01		CO1,RB1
1.12	Cooperating Process	T1	116	-	Black Board	01		CO1,RB1
1.13	Thread	T1	104	105	Black Board	01		CO1,RB2



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			From	To				
UNIT-II								16
(CPU SCHEDULING)								
2.1	Scheduling Criteria	T1	187	188	Black Board	01		CO2,RB 2
2.2	Scheduling algorithms	T1	188	198	Black Board	04		CO2,RB 5
2.3	Multiple-Processor Scheduling	T1	200	206	Black Board	01		CO2,RB 3
2.4	System call Interface for process management- fork,exit,wait,waitpid,exec	T1	812	814	Black Board	02		CO1,RB 3
2.5	Deadlocks - System Model	T1	283	284	Black Board	01		CO3,RB 2
2.6	Deadlock Characterization	T1	285	289	Black Board	01		CO3,RB 1
2.7	Methods for Handling Deadlocks	T1	290	291	Black Board	01		CO3,RB 4
2.8	Deadlock Prevention	T1	291	294	Black Board	01		CO3,RB 3
2.9	Deadlock Avoidance	T1	294	300	Black Board	01		CO3,RB 4
2.10	Deadlock Detection and Recovery from Deadlock	T1	301	305	Black Board	01		CO3,RB 5
	Review	Signature of the HOD/Coordinator						



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			From	To				
UNIT-III								15
(PROCESS MANAGEMENT AND SYNCHRONIZATION)								
3.1	Process Synchronization	T1	225	227	Black Board	01		CO3,RB1
3.2	The Critical section Problem	T1	227	229	Black Board	01		CO3,RB3
3.3	Synchronization Hardware	T1	231	234	Black Board	01		CO3,RB2
3.4	Semaphores	T1	234	239	Black Board	01		CO3,RB1
3.5	Classic Problems of Synchronization	T1	239	244	Black Board	02		CO3,RB4
3.6	Critical Region ,Monitors	T1	244	252	Black Board	01		CO3,RB1
3.7	Inter Process Communication	T1	116	122	Black Board	02		CO2,RB2
3.8	IPC on single Computer	T1	122	127	Black Board	01		CO3,RB2
3.9	IPC Mechanisms using pipes,FIFO, message queues, shared memory	T1	128	139	Black Board	01		CO3,RB3
	Review		Signature of the HOD/Coordinator					



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Unit/ Item No.	Topic (s)	Book Reference	Page (s)		Teaching Methodolog y	Propose d No. of Periods	Actual Date of Handle d	CO/RBT
			From	To				
UNIT-IV								10
(MEMORY MANAGEMENT AND VIRTUAL MEMORY)								
4.1	Logical & physical Address Space	T1	318	320	Black Board	01		CO4,RB2
4.2	Swapping	T1	322	324	Black Board	01		CO4,RB1
4.3	Contiguous Allocation	T1	324	328	Black Board	01		CO4,RB2
4.4	Paging	T1	328	337	Black Board	02		CO4,RB2
4.5	Segmentation, Segmentation with Paging	T1	344	345	Black Board	01		CO4,RB4
4.6	Demand Paging	T1	361	366	Black Board	01		CO4,RB2
4.7	Page Replacement	T1	369	372	Black Board	01		CO4,RB5
4.8	Page Replacement Algorithms	T1	373	380	Black Board	02		CO4,RB3
	Review	Signature of the HOD/Coordinator						

	SRI INDU COLLEGE OF ENGINEERING & TECHNOLOGY LESSON PLAN (Regulation :R22) DEPARTMENT OF INFORMATION TECHNOLOGY		Prepared on Jan' 2025
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Unit/ Item No.	Topic (s)	Book Reference	Page (s)		Teaching Methodology	Proposed No. of Periods	Actual Date of Handled	CO/RBT
			From	To				
UNIT-V					10			
5.1	File System Interface and Operation	T1	430		Black Board	01		CO5,RB2
5.2	Access methods	T1	430	433	Black Board	01		CO6,RB1
5.3	Directory Structure	T1	432	444	Black Board	01		CO5,RB3
5.4	Protection	T1	451	456	Black Board	02		CO6,RB3
5.5	File System Structure	T1	461	463	Black Board	01		CO5,RB3
5.6	Allocation methods	T1	471	478	Black Board	01		CO5,RB4
5.7	Free-space Management	T1	479	482	Black Board	02		CO5,RB2
5.8	Usage of open,read,write,close,lseek, stat,iocctl system calls	T1	424	425	Black Board	01		CO1,RB3
	Review	Signature of the HOD/Coordinator						

LIST OF TEXT BOOKS AND REFERENCES

TEXT BOOKS:

1. Operating System Principles, Abraham Silberchatz, Peter B. Galvin, Greg Gagne 8th Edition, Wiley Student Edition.
2. Operating systems - Internals and Design Principles, W. Stallings, 6th Edition, Pearson.

REFERENCE BOOKS:

1. Modern Operating Systems, Andrew S Tanenbaum 3rd Edition PHI.
2. Operating Systems A concept - based Approach, 2nd Edition, D. M. Dhamdhare, TMH.
3. Principles of Operating Systems, B. L. Stuart, Cengage learning, India Edition.
4. Operating Systems, A. S. Godbole, 2nd Edition, TMH
5. An Introduction to Operating Systems, P.C.P. Bhatt, PHI.

Web links

- W1: <http://www.cse.iitd.ac.in/os-lectures/lec%201.mp4>
 W2: <https://nptel.ac.in/courses/106106144/30>
 W3: <https://nptel.ac.in/courses/106106144/9>
 W4: <http://www.cse.iitd.ac.in/os-lectures/lec%2032.mp4>
 W5: <https://nptel.ac.in/courses/106106144/32>

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	Faculty Name & Designation	Dr.P. EPSIBA Assoc. Professor	

ASSIGNMENT - 1

Q.No.	QUESTIONS	Level	COs	Roll.No																											
1	What is meant by operating Systems? List the advantages of Operating system	II	CO1	1201-05																											
2	What is thread? Explains about types of threads	VI	CO 1																												
3	Explain about Deadlock Prevention and Deadlock Avoidance	V	CO2																												
4	For the following example, calculate average waiting time and turn around time priority scheduling algorithms.(non-preemptive)	V	CO 2																												
	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Process ID</th> <th>Arrival Time</th> <th>Burst Time</th> <th>Priority</th> </tr> </thead> <tbody> <tr><td>P1</td><td>0</td><td>5</td><td>2</td></tr> <tr><td>P2</td><td>1</td><td>6</td><td>1</td></tr> <tr><td>P3</td><td>2</td><td>2</td><td>3</td></tr> <tr><td>P4</td><td>3</td><td>1</td><td>5</td></tr> <tr><td>P5</td><td>4</td><td>7</td><td>4</td></tr> <tr><td>P6</td><td>4</td><td>6</td><td>0</td></tr> </tbody> </table>	Process ID	Arrival Time		Burst Time	Priority	P1	0	5	2	P2	1	6	1	P3	2	2	3	P4	3	1	5	P5	4	7	4	P6	4	6	0	
Process ID	Arrival Time	Burst Time	Priority																												
P1	0	5	2																												
P2	1	6	1																												
P3	2	2	3																												
P4	3	1	5																												
P5	4	7	4																												
P6	4	6	0																												
5	What is Semaphores? List out the atomic operations and explain them clearly	I	CO3																												
1	Explain different Operations on processes	V	CO1	1206-10																											
2	What is System Calls? Discuss about types of system calls	I	CO1																												
3	What is preemptive and non-preemptive scheduling? Explain about FCFS scheduling algorithm.	I	CO2																												
4	For the following example, calculate average waiting time and turn around time priority scheduling algorithms.(non-preemptive)	V	CO 2																												

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5	Explain in detail about the critical section problem.		V	CO3																													
1	Elaborate about Functions of Operating System.		V I	CO1	1211-15																												
2	Explain about Process Control Block		II	CO1																													
3	Discuss about Deadlock Prevention techniques with suitable examples.		VI	CO2																													
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5	Identify the classic Problems of Synchronization		III	CO3																													
1	Demonstrate about the co-operating process.		II	C O 1	1216-20																												
2	Distinguish between Process and Thread		IV	CO1																													
3	Explain briefly about the methods of handling Deadlocks		II	CO2																													
4	For the following example, calculate average waiting time and turn around time priority scheduling algorithms.(non-preemptive)	<table border="1"> <thead> <tr> <th>Process ID</th> <th>Arrival Time</th> <th>Burst Time</th> <th>Priority</th> </tr> </thead> <tbody> <tr> <td>P1</td> <td>0</td> <td>5</td> <td>2</td> </tr> <tr> <td>P2</td> <td>1</td> <td>6</td> <td>1</td> </tr> <tr> <td>P3</td> <td>2</td> <td>2</td> <td>0</td> </tr> <tr> <td>P4</td> <td>3</td> <td>1</td> <td>5</td> </tr> <tr> <td>P5</td> <td>4</td> <td>7</td> <td>4</td> </tr> <tr> <td>P6</td> <td>4</td> <td>6</td> <td>3</td> </tr> </tbody> </table>	Process ID	Arrival Time		Burst Time	Priority	P1	0	5	2	P2	1	6	1	P3	2	2	0	P4	3	1	5	P5	4	7	4	P6	4	6	3	V	C O 2
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5	Evaluate the Dining–Philosophers solution using monitors.		V	CO 3																													
1	Define Process? Explain about Process State Diagram.		III	CO1																													
2	What is meant by operating Systems? List the advantages of Operating system		I I	CO 1																													
3	Explain about the System call interface for Process management in		II	CO2																													

	detail.			1221-25																											
4	For the following example, calculate average waiting time and turn around time priority scheduling algorithms.(non-preemptive)	V	CO 2																												
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5	Identify the classic Problems of Synchronization	III	CO3																												
1	List and explain about the Operating System Services.	II I	CO 1	1226-30																											
2	Explain about Multithreading its models?	V	CO 1																												
3	What is meant by Scheduling Criteria? Explain in details	II	CO1																												
4	For the following example, calculate average waiting time and turn around time priority scheduling algorithms.(non-preemptive)	V	C O 2																												
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5	Explain about Producer and consumer problem in critical section	II	CO3																												
1	Explain about Process Control Block	II	CO 1	1231-35																											
2	What is meant by operating Systems? List the advantages of Operating system	I I	CO1																												
3	Explain different Scheduling algorithms and its types.	V	CO2																												
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5	Explain in detail about the critical section problem.	V	CO 3																												

1	What is System Calls? Discuss about types of system calls	II	CO1	1236-40																												
2	Explain about Process Control Block	II	CO1																													
3	For the following example, calculate average waiting time and turn around time priority scheduling algorithms.(non-preemptive)	V	CO2																													
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4	Explain different methods of recovery from deadlocks.	II	CO2																													
5	Explain about Synchronization hardware in detail.	VI	CO3																													
1	Discuss about Process Scheduling Queues in detail	VI	CO1	1241-45																												
2	List and explain any 5 Operating system types in detail	IV	CO1																													
3	For the following example, calculate average waiting time and turn around time priority scheduling algorithms.(non-preemptive)	V	CO2																													
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4	What is Deadlock? What are the necessary conditions to occur for deadlock?	II	CO2																													
5	Explain about Synchronization hardware in detail.	VI	CO3																													
1	Explain in detail about File and Device management type system call	II	CO1	1246-50																												
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4	Discuss about Bankers Algorithm with suitable examples.				VI	CO2		
5	Evaluate Peterson's Solution with example				V	CO3		
1	What is thread? Explains about types of threads				VI	CO1	1251-56	
2	Explain in detail about File and Device management type system call				II	CO1		
3	For the following example, calculate average waiting time and turn around time priority scheduling algorithms.(non-preemptive)				V	CO2		
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	P3	2	2	0				
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	P6	4	6	3				
4	Discuss about Bankers Algorithm with suitable examples.				VI	CO2		
5	Explain in detail about the critical section problem.				V	CO3		
1	Distinguish between Process and Thread				IV	CO1	1257-1262	
2	List and explain any 5 Operating system types in detail				IV	CO1		
3	For the following example, calculate average waiting time and turn around time priority scheduling algorithms.(non-preemptive)				V	CO2		
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	P6	4	6	5				
4	Discuss about Bankers Algorithm with suitable examples.				VI	CO2		
5	Explain about Producer and consumer problem in critical section				II	CO3		
1	Explain about Multithreading its models?				II	CO1	1263-LE-03	
2	Discuss about Process Scheduling Queues in detail				VI	CO1		
3	For the following example, calculate average waiting time and turn around time priority scheduling algorithms.(non-preemptive)				V	CO2		
	Process ID	Arrival Time	Burst Time	Priority				
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4	Evaluate round robin scheduling algorithm with an example.				V	CO2		
5	Evaluate the Dining–Philosophers solution using monitors.				V	CO3		

ASSIGNMENT – 2

UNIT – III

Q.No.	QUESTION	BT	CO
1	Explain about Producer and consumer problem in critical section	II	CO3
2	Discuss about the classic Problems of Synchronization	II	CO3
3	Elaborate the Dining – Philosophers solution using monitors.	IV	CO3
4	Explain state IPC paradigms and implementations.	II	CO4
5	What are the models of IPC? Explain it.	I	CO4
6	What is the use of pipes explain with an example?	I	CO4
7	Explain the concept of Inter Process Communication Mechanisms with an example?	II	CO4
8	Difference between Message queue and Shared memory?	II	CO4
9	Explain use of message passing & semaphore for inter process communication?	II	CO4
10	Explain the concept of IPC between processes on different system?	II	CO4

UNIT – IV

Q.NO	QUESTION	BT	CO
11	Briefly explain about segmentation?	II	CO5
12	Explain LRU page replacement algorithm with this example.	II	CO5
13	Consider the following reference string 7,0,1,2,0,3,0,4,2,3,0,3,2,1,2,0,1,7,0,1 Assume there are three frames. Apply LRU replacement algorithm to the reference string above and find out how many page faults are produced. Illustrate the LRU page replacement algorithm in detail and also two feasible implementation of the LRU algorithm	III	CO5
14	What is paging? Explain the basic method for implementing paging.	I	CO5
15	Describe about a) Contiguous memory allocation b) Fragmentation.	II	CO5
16	Illustrate about allocation of frames.	III	CO5
17	Explain FIFO page replacement algorithm necessary reference string? Consider the following reference string 7,0,1,2,0,3,0,4,2,3,0,3,2,1,2,0,1,7,0,1.	IV	CO5
18	Explain the various page replacement strategies.	I	CO5
19	What is demand paging and what are its uses?	I	CO5
20	Write about the techniques for structuring the page table.	I	CO5
21	What are the differences between? a) Logical and physical address? b) Page table and segment table? c) First-fit placement and best-fit placement?	I	CO5
22	Explain about page replacement algorithms?	I	CO5
23	Difference between segmentation paging and demand paging with an example?	V	CO5
24	What are the advantages and disadvantages of page replacement algorithms?	I	CO5
25	How can the system distinguish between the pages that are in main memory from the pages that are on the disk?	I	CO5

UNIT – V

Q.NO	QUESTION	BT	CO
26	Explain about sequential and indexed file access methods.	II	CO6
27	Illustrate layered-file system implementation? Mention the various file-directory structures.	III	CO6

28	Explain the three allocation methods in file system implementation? Illustrate with proper diagram.	II	CO6
29	Explain i) File sharing ii) Protection.	II	CO6
30	Explain about access methods?	II	CO6
31	Explain in detail the four approaches to free –space management?	II	CO6
32	Discuss about the access rights and management simultaneous access.	II	CO6
33	Explain disk structure a disk scheduling.	II	CO6
34	Explain swap-space management.	II	CO6
35	Consider the following disk queue with requests for I/O to blocks on cylinders 98,183,37,122,14,124,65,67 in that order, using FCFS algorithm of the disk head is initially at cylinder 53 find the total head movement in cylinders. Also provide the necessary diagram to show the head movement for the above queue.	V	CO6
36	Explain various directory operations in briefly?	II	CO6
37	What is a file? List the various file attributes and file operations?	I	CO6
38	Draw the diagram for tree structured directories and explain it.?	II	CO6
39	What are the advantages and disadvantages of free space management?	I	CO6
40	Explain various system calls for file management system?	II	CO6

QUESTIONS ALLOTMENT LIST FOR STUDENTS

<u>S.NO</u>	<u>ROLL NUMBERS</u>	<u>QUESTIONS TO ANSWER</u>
SET 1	1 TO 6 , LE 1	1, 11, 21, 26, 36
SET 2	7 TO 12, LE 2	2, 12, 22, 27, 37
SET 3	13 TO 18, LE 3	3, 13, 23, 28, 38
SET 4	19 TO 24, LE 5	4, 14, 24, 29, 39
SET 5	25 TO 30, LE 6	5, 15, 25, 30, 40
SET 6	31 TO 36	6, 16, 21, 31, 36
SET 7	37 TO 42	7, 17, 22, 32, 37
SET 8	43 TO 48	8, 18, 23, 33, 38
SET 9	49 TO 56	9, 19, 24, 34, 39
SET 10	57 TO 64	10, 20, 25, 35, 40

SELF STUDY TOPICS			
S.No.	Topics	Books & Journals	Course Outcomes
1	UNIX & LINUX	UNIX AND LINUX System Administration handbook by Evi Nemeth, Garth Snyder, Trent R. Hein	CO-6
2	Process Scheduling Algorithm	R1. Modern Operating Systems, Andrew S Tanenbaum 3rd Edition PHI.	CO-5

QUESTION BANK

QUESTIONBANK WITH BLOOMSTAXONOMYLEVEL (BTL)

(1.REMEMBERING 2 .UNDERSTANDING3.APPLYING4.ANALYSING5.EVALUATING 6.CREATING)

UNIT- I			
OBJECTIVEQUESTIONS			
SL.NO	MCQ'S	BT Level	Course Outcome
1C-1	What is an operating system? a) interface between the hardware and application programs b) collection of programs that manages hardware resources c) system service provider to the application programs d) all of the mentioned	I	CO1
1C-2	What is the main function of the command interpreter? a) to provide the interface between the API and application program b) to handle the files in the operating system c) to get and execute the next user-specified command d) none of the mentioned	I	CO1
1C-3	To access the services of the operating system, the interface is provided by the _____ a) Library b) System calls c) Assembly instructions d) API	I	CO1
1C-4	Where is the operating system placed in the memory? a) either low or high memory (depending on the location of interrupt vector) b) in the low memory c) in the high memory d) none of the mentioned	I	CO1
1C-5	Which of the following command to be issued by the process to the DMA controller if the processor wishes to read/write a data (A) read/write operation to be performed (B) address of the I/O device involved (C) starting location in the main memory to read data from or write data to (D) number of words to be read or written (E) All of the above	I	CO1
1C-6	In a timeshare operating system, when the time slot assigned to a process is completed, the process switches from the current state to? a) Suspended state b) Terminated state c) Ready state d) Blocked state	I	CO1

1C-7	In real time operating system _____ a) process scheduling can be done only once b) all processes have the same priority c) kernel is not required d) a task must be serviced by its deadline period	I	CO1
1C-8	Whenever a process needs I/O to or from a disk it issues a _____ a) system call to the operating system b) a special procedure c) system call to the CPU d) all of the mentioned	II	CO1
1C-9	If one thread opens a file with read privileges then _____ a) other threads in the another process can also read from that file b) other threads in the same process can also read from that file c) any other thread can not read from that file d) all of the mentioned	I	CO1
1C-10	Which of the statement is incorrect? (A) The kernel is a program that constitutes the central core of the OS (B) The kernel provides essential services to all other parts of the OS (C) The kernel can directly interact with the user (D) The kernel can directly interact with the shell program (E) The kernel can directly interact with the hardware	I	CO1
1C-11	Which of the following is not a system program? (A) Operating system (B) Device driver (C) Boot loader (D) Shell (E) User program	I	CO1
1C-12	Which of the following is not a UNIX system call? (A) fork() (B) pipe() (C) ioctl() (D) Sleep() (E) open()	I	CO1
1C-13	Which of the operating system does not support modular structure? (A) UNIX (B) Solaris (C) MS-DOS (D) Linux (E) Window	I	CO1
1C-14	Which of the following provides the interface for the user to get service from the operating system? (A) System call (B) Library function (C) Debugger (D) Assembler (E) Compiler	I	CO1

1C-15	In connection with the system call, which of the statements seem to be appropriate? (A) the transition from user mode to kernel mode is done using a system call (B) modebitissetto0 when a process is executing in user mode (C) modebitissetto1 when a process is executing in kernel mode (D) a trap is a software interrupt generated by the user during system call execution (E) timer is a software that is used to prevent the infinite loop in a user program	I	CO1
FILLIN THE BLANKS			
1F-1	_____ Was designed to keep the processor and I/O devices, including storage devices, simultaneously busy to achieve Maximum efficiency.	I	CO1
1F-2	A process in the _____ state is in main memory and available for execution.	II	CO1
1F-3	In a _____ multiprocessor all processors can perform the same functions so the failure of a single processor does not halt the machine.	I	CO1
1F-4	Windows makes use of two types of process-related objects: processes and _____	III	CO1
1F-5	The _____ tables provide information about the existence of files, their location on secondary memory, their current status, and other attributes.	I	CO1
1F-6	There are two broad categories of thread implementation: user-level threads(ULTs)and _____ .	I	CO1
1F-7	The key states for a thread are :Running, _____ ,and Blocked.	I	CO1
1F-8	Thestatetransitioninitiatedbytheuserprocessitselfinanope ratingsystemis _____	I	CO1
1F-9	Operating system is ----- software.	I	CO1
1F-10	File management is function of _____	I	CO1
1F-11	Name the function which deals with hardware _____	I	CO1
1F-12	An operating system acts as a/an _____ between hardware And software.	I	CO1
1F-13	A Control/Status register that contains the address of the next instruction to be fetched is called the _____ .	I	CO1
1F-14	The _____ is a device for staging the movement of data between main memory and processor registers to improve performance and is not usually visible to the programmer or processor.	I	CO1
1F-15	A significant point about the _____ is that it contains sufficient information so that it is possible to interrupt a running process and later resume execution as if the interruption had not occurred.	II	CO1

**MATCHTHEFOLLOWIN
G**

1M-1	1. Operating System 2. Language Processor 3. Package Administration S/W 4. Utility 5. Customized S/W	a. Compiler b. Windows Vista c. Shanti Hospital d. Spreadsheet e. Disk	I	CO1
1M-2	1. Threads 2. Scheduling 3. Process witch 4. Non preemptive	a. Operating systems b. FCFS c. Light weight process d. Mode switch	I	CO1
1M-3	1. Kernel 2. Device Programs 3. Utility Programs 4. Supporting multitasking Hardware components 5. Supporting multiprocessing designed to help analyses or maintain a computer	a. Program b. Heart of OS c. Concurrent Program d. Software control e. System software	III	CO1
1M-4	1. OS 2. CUI 3. GUI 4. Printer 5. Keyboard	a. Windows b. Kernel program c. Input devices d. Output devices e. DOCS	IV	CO1
1M-5	1. Executable file 2. Active Entity 3. Process 4. Program execution 5. Kernel	a. Operating Systems b. Processor c. Passive entity d. next execution e. heap	I	CO1

5-MARKSQUESTIONS

1D-1	What is meant by operating Systems? List the advantages of Operating system	I	CO1
1D-2	List and explain any 5 Operating system types in detail	IV	CO2
1D-3	Elaborate about Functions of Operating System.	VI	CO1
1D-4	Explain History of operating system?.	II	CO1
1D-5	Define Process? Explain about Process State Diagram.	III	CO1
1D-6	Explain different Operations on processes	V	CO1
1D-7	Demonstrate about the co-operating process.	II	CO2
1D-8	List and explain about the Operating System Services.	III	CO1
1D-9	Explain about Process Control Block	II	CO1
1D-10	Discuss about Process Scheduling Queues in detail	VI	CO1
1D-11	What is System Calls? Discuss about types of system calls	I	CO2
1D-12	Explain in detail about File and Device management type system call	II	CO1
1D-13	What is thread? Explains about types of threads	VI	CO1
1D-14	Explain about Multithreading its models?	II	CO1
1D-15	Distinguish between Process and Thread	IV	CO1

UNIT- II			
OBJECTIVE QUESTIONS			
SL.NO		BTL level	Course Outcome
2C-1	In Operating Systems, which of the following is/are CPU scheduling algorithms? a) Priority b) Round Robin c) Shortest Job First d) All of the mentioned	I	CO2
2C-2	CPU scheduling is the basis of _____ a) multiprogramming operating systems b) larger memory sized systems c) multiprocessor systems d) none of the mentioned	I	CO2
2C-3	For an effective operating system, when to check for deadlock? a) every time a resource request is made at fixed time intervals b) at fixed time intervals c) every time a resource request is made d) none of the mentioned	I	CO2
2C-4	The FCFS algorithm is particularly troublesome for _____ a) operating systems b) multiprocessor systems c) time sharing systems d) multiprogramming systems	I	CO2
2C-5	In direct inter process communication between two processes, a communication link is (A) Only bidirectional. (B) Only unidirectional. (C) established only if processes share a common mailbox. (D) May be associated with many processes. (E) Is associated with exactly one pair of communicating processes	I	CO2
2C-6	A multicore system (A) Supports multithreading. (B) Multiple threads can execute concurrently. (C) Improves system performance through multithreading (D) Sharing resources among threads is easier than shared memory (E) All of the above.	I	CO2

2C-7	<p>A deadlock avoidance algorithm dynamically examines the _____ to ensure that a circular wait condition can never exist.</p> <p>a) operating system b) resources c) system storage state d) resource allocation state</p>	I	CO2										
2C-8	<p>The wait-for graph is a deadlock detection algorithm that is applicable when _____</p> <p>a) all resources have a single instance b) all resources have multiple instances c) all resources have a single 7 multiple instances d) all of the mentioned</p>	I	CO2										
2C-9	<p>What are Multithreaded programs?</p> <p>a) lesser prone to deadlocks b) more prone to deadlocks c) not at all prone to deadlocks d) none of the mentioned</p>	I	CO2										
2C-10	<p>Consider the following set of processes, the length of the CPU burst time given in milliseconds.</p> <table border="1"> <thead> <tr> <th>Process</th> <th>Burst time</th> </tr> </thead> <tbody> <tr> <td>P1</td> <td>6</td> </tr> <tr> <td>P2</td> <td>8</td> </tr> <tr> <td>P3</td> <td>7</td> </tr> <tr> <td>P4</td> <td>3</td> </tr> </tbody> </table> <p>Assuming the above process being scheduled with the SJF scheduling algorithm.</p> <p>a) The waiting time for process P1 is 3ms b) The waiting time for process P1 is 0ms c) The waiting time for process P1 is 16ms d) The waiting time for process P1 is 9ms</p>	Process	Burst time	P1	6	P2	8	P3	7	P4	3	III	CO2
Process	Burst time												
P1	6												
P2	8												
P3	7												
P4	3												
2C-11	<p>Message-passing inter process communication allows multiple cooperating processes</p> <p>(A) To exchange information without the kernel. (B) To synchronize their actions without sharing the same address space. (C) to communicate by sharing the same address space. (D) Which must be run in the same computer system. (E) Using the fork() system call.</p>	I	CO2										
2C-12	<p>Which statement is incorrect in a many-to-one threading model?</p> <p>(A) Multiple user threads are managed in user space. (B) Multiple user threads map to a single kernel thread. (C) There is no overhead of transition from user mode to kernel mode. (D) The process will not be blocked even if any user thread executes a blocking system call. (E) None of the above.</p>	I	CO2										

2C-13	For the following set of processes scheduled using FCFS policy, determine the average waiting time. Process Arrival time Burst timeP1 0 11 P2 2 4 P3 3 2 (A)5.67 (B)6.00 (C)7.00 (D)8.00 (E)9.54	II	CO2
2C-14	For the following set of processes scheduled using FCFS policy, determine the average turnaround time. Process Arrival time Burst timeP1 0 11 P2 2 4 P3 3 2 (A)10.66 (B)11.66 (C)12.66 (D)13.68 (E)14.70	II	CO2
2C-15	Which statement is true for a preemptive scheduling algorithm? (A) CPU is allocated for the entire burst time to a process (B) Race conditions will never occur if data are shared among multiple processes (C) UNIX OS is not supporting preemptive scheduling (D) Round- Robin is not supporting preemptive scheduling (E) A low-priority process will wait if a high-priority process arrives simultaneously	I	CO2
FILL IN THE BLANKS			
2F-1	DEL command is used to-----	I	CO2
2F-2	A_____computer combines two or more processors on a single piece of silicon.	I	CO2
2F-3	A situation in which two or more processes are unable to proceed because each is waiting for one of the others to do something is a -----	I	CO2
2F-4	In the case of competing processes three control problems must be faced: mutual exclusion , deadlock ,and .	I	CO2
2F-5	The_____is a directed graph that depicts a state of the system of resources and processes, with each process and each resource represented by a node.	I	CO2
2F-6	What is meant by fork() function call?	I	CO2
2F-7	_____refers to the ability of an OS to support multiple, concurrent paths of execution within a single process.	I	CO2
2F-8	The process is said to be operating in a_____fashion if each process in the queue is given a certain amount of time, in turn, to execute and the n returned to the queue, unless	III	CO2

	blocked.		
2F-9	The strategy of resource allocation denial is referred to as the	I	CO2
2F-10	Spooling allowed the CPU to choose a particular job for execution leading to the concept called the ____	I	CO2
2F-11	Operating System allocates ____ in such a manner so as to achieve the maximum best possible result.	I	CO2
2F-12	To 'boot' the system the computer must have a(n) _____	I	CO2
2F-13	Scheduling is allow in g job to use the -----	I	CO2
2F-14	Round robin is a ----- policy	I	CO2
2F-15	In UNIX, name the system call which create(s) the new process	I	CO2
MATCH THE FOLLOWING			
2M-1	1.FCFS 2.SJF 3.SRJF 4.Round Robin 5.Priority	a. high to low b. Quantum c. First come first serve d. shortest job first e. Shortest remaining job first	II CO2
2M-2	1. Symmetric 2. Asymmetric 3. Real time scheduling 4. User Mode 5. CPU utilization	a. Master/Slave b. Kernel Mode c. Burst time d. Interrupt e. self-scheduling	I CO2
2M-3	1. Bankers algorithm 2. Resources 3. Hold & Wait 4. Mutual exclusion 5. Rollback	a. Process b. Shared resources c. Recovery d. Deadlock e. Avoidance	III CO2
2M-4	1.Parent– 2. child 3.Cluster 4.fork() 5.cache	a. exit b. wait c. new creation d. copy e. group	I CO2
2M-5	1.Program counter 2.New 3.Run 4.Wait 5.Ready	a. Execute b. address to the next instruction c. Next instruction d. Waiting e. creation	I CO2
5-MARKS QUESTIONS			
2D-1	What is meant by Scheduling Criteria? Explain in details	I	CO1
2D-2	Explain different Scheduling algorithms and its types.	V	CO2
2D-3	What is preemptive and non-preemptive scheduling? Explain about FCFS scheduling algorithm	I	CO2
2D-4	Evaluate round robin scheduling algorithm with an example.	V	CO2

2D-5	<p>Consider the following four processes, with the length of the CPU burst given in milliseconds.</p> <table border="1"> <thead> <tr> <th>Process ID</th> <th>Arrival Time</th> <th>Burst Time</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>0</td> <td>6</td> </tr> <tr> <td>2</td> <td>1</td> <td>4</td> </tr> <tr> <td>3</td> <td>2</td> <td>1</td> </tr> <tr> <td>4</td> <td>3</td> <td>3</td> </tr> <tr> <td>5</td> <td>4</td> <td>7</td> </tr> </tbody> </table> <p>Calculate the average waiting time for Non-preemptive SJF scheduling</p>	Process ID	Arrival Time	Burst Time	1	0	6	2	1	4	3	2	1	4	3	3	5	4	7	IV	CO3										
Process ID	Arrival Time	Burst Time																													
1	0	6																													
2	1	4																													
3	2	1																													
4	3	3																													
5	4	7																													
2D-6	<p>For the following example, calculate average waiting time and turnaround time priority scheduling algorithms.(non-preemptive)</p> <table border="1"> <thead> <tr> <th>Process ID</th> <th>Arrival Time</th> <th>Burst Time</th> <th>Priority</th> </tr> </thead> <tbody> <tr> <td>P1</td> <td>0</td> <td>5</td> <td>5</td> </tr> <tr> <td>P2</td> <td>1</td> <td>6</td> <td>4</td> </tr> <tr> <td>P3</td> <td>2</td> <td>2</td> <td>0</td> </tr> <tr> <td>P4</td> <td>3</td> <td>1</td> <td>2</td> </tr> <tr> <td>P5</td> <td>4</td> <td>7</td> <td>1</td> </tr> <tr> <td>P6</td> <td>4</td> <td>6</td> <td>3</td> </tr> </tbody> </table>	Process ID	Arrival Time	Burst Time	Priority	P1	0	5	5	P2	1	6	4	P3	2	2	0	P4	3	1	2	P5	4	7	1	P6	4	6	3	V	CO3
Process ID	Arrival Time	Burst Time	Priority																												
P1	0	5	5																												
P2	1	6	4																												
P3	2	2	0																												
P4	3	1	2																												
P5	4	7	1																												
P6	4	6	3																												
2D-7	Discuss about Deadlock Prevention techniques with suitable examples.	VI	CO2																												
2D-8	Demonstrate Multiple -Processor Scheduling	III	CO2																												
2D-9	Explain about the System call interface for Process management in detail.	II	CO2																												
2D-10	Explain about the importance of System Model,	I	CO2																												
2D-11	What is Deadlock? What are the necessary conditions to occur for deadlock?	I	CO2																												
2D-12	Explain briefly about the methods of handling Deadlocks	II	CO2																												
2D-13	Explain about Deadlock Prevention and Deadlock Avoidance	V	CO2																												
2D-14	Explain different methods of recovery from deadlocks.	II	CO2																												
2D-15	Write short notes on deadlock detection.	I	CO2																												
2D-16	Discuss about Bankers Algorithm with suitable examples.	VI	CO2																												

UNIT-III**OBJECTIVE QUESTIONS**

SL.NO		BTLevel	Course Outcome
3C-1	The segment of code in which the process may change common variables, update tables, write into files is known as _____ a) program b) critical section c) non – critical section d) synchronizing	I	CO3
3C-2	Which of the following conditions must be satisfied to solve the critical section problem? a) Mutual Exclusion b) Progress c) Bounded Waiting d) All of the mentioned	I	CO3
3C-3	A minimum of _____ variable(s) is/are required to be shared between processes to solve the critical section problem. a) one b) two c) three d) four	V	CO3
3C-4	When several processes access the same data concurrently and the outcome of the execution depends on the particular order in which the access takes place is called _____ a) dynamic condition b) race condition c) essential condition d) critical condition	I	CO3
3C-5	If a process is executing in its critical section, then no other processes can be executing in their critical section. What is this condition called? a) mutual exclusion b) critical exclusion c) synchronous exclusion d) asynchronous exclusion	I	CO3
3C-6	Which one of the following is a synchronization tool? a) thread b) pipe c) semaphore d) socket	I	CO3

3C-7	Semaphore is a/an _____ to solve the critical section problem. a) hardware for a system b) special program for a system c) integer variable d) none of the mentioned	I	CO3
3C-8	Process synchronization can be done on _____ a) hardware level b) software level c) both hardware and software level d) none of the mentioned	I	CO3
3C-9	Which of the following two operations are provided by the IPC facility? (A) Write & delete message (B) Delete & receive message (C) Send & delete a message (D) Receive & send message	I	CO4
3C-10	The segment of code in which the process may change common variables, update tables, write into files is known as ____ (A) program (B) race condition (C) synchronizing (D) critical section	I	CO4
3C-11	Pipe performs _____ communication. (A) one-way (B) two-way (C) three-way (D) N-way	I	CO4
3C-12	Which of the following is an advantage of message passing over shared memory A. Simpler implementation B. Higher performance C. Easier to scale to multiple processors D. Lower overhead	I	CO4
3C-13	Which of the following is an example of an asynchronous IPC mechanism? A. Shared Memory B. Message Queues C. Semaphores D. Signals	I	CO4

3C- 14	Message passing system allows processes to _____ A) Communicate with each other without sharing same address space B) Communicate with one another by resorting to shared data C) Share data D) Name the recipient or sender of the message	I	CO4
3C-15	The link between two processes P and Q to send and receive messages is called A) Communication link B) message-passing link C) synchronization link D) all of the mentioned	I	CO4
FILLINTHEBLANKS			
3F-1	_____ is a section of code within a process that requires access to shared resources and that must not be executed while another process is in a corresponding section of code.	III	CO3
3F-2	A situation in which multiple threads or processes read and write a shared data item and the final result depends on the relative timing of their execution Is a _____.	I	CO3
3F-3	A _____ is a semaphore that takes on only the values of 0 and 1.	I	CO3
3F-4	In the case of _____, messages are not sent directly from sender to receiver but rather are sent to a shared data structure consisting of queues that can temporarily hold messages.	III	CO3
3F-5	_____ is a function or action implemented as a sequence of one or more instructions that appear to be indivisible; no other process can see an intermediate state or interrupt the operations.	I	CO3
3F-6	_____ is a synchronization mechanism used to solve the critical section problem.	I	CO3
3F-7	_____ is a key component used in Peterson's algorithm for mutual exclusion in operating systems.	I	CO3
3F-8	Inter-process communication mechanism provides two operations that are _____.	I	CO3
3F-9	Inspired by the concept of co-routines, a _____ is a circular buffer allowing two processes to communicate on the producer-consumer model.	II	CO4
3F-10	A _____ is a variable that controls the access to a common resource by multiple processes.	I	CO4
3F-11	The _____ is the endpoint for sending or receiving data in a network.	I	CO4
3F-12	Concurrent access to shared data may result in _____.	I	CO4
3F-13	What are the two kinds of semaphores _____.	I	CO4
3F-14	What are the operations that can be invoked on a condition variable?	V	CO4
3F-15	Bounded capacity and Unbounded capacity queues are referred to as _____.	I	CO4

MATCH THE FOLLOWING

3M-1	1.Producer 2.Consumer 3.Bounded Waiting 4.Critical section 5.chopstick	a. full b. empty c. synchronization d. dining philosopher e. relative speed	I	CO3
3M-2	1. Binary 2. Signal() 3.Wait() 4. Semaphores 5. Thread	a. Light weight process b. Critical section c.0's&1's d. decrement e. increment	I	CO3
3M-3	1. Boolean 2. Test and set 3. Software tools 4. Block() 5. Wakeup()	a. ready queue b. Waiting queue c. variables d. semaphore hardware e. Mutex	II	CO3
3M-4	a. Pipes b. Shared memory c. Message passing d. IPC e. FIFO	a. perform multiple tasks at a time b. Synchronization c. First in first out d. Message Queue e. One-way	I	CO4
3M-5	a. IPC b. Message Queue c. Message passing d. Communication Link e. Producer-consumer	a. Kernel space b. Send and Receive c. Exchange messages between two processes d. Shared memory e. Easier to debug	I	CO4

5-MARKS QUESTIONS

3D-1	Explain in detail about the critical section problem.	V	CO3
3D-2	Evaluate Peterson's Solution with example	V	CO3
3D-3	Explain about Synchronization hardware in detail.	VI	CO3
3D-4	What is Semaphores? List out the atomic operations and explain the m clearly	I	CO3
3D-5	Explain about Producer and consumer problem in critical section	II	CO3
3D-6	Identify the classic Problems of Synchronization	III	CO3
3D-7	Evaluate the Dining-Philosophers solution using monitors.	V	CO3
3D-8	Examine the importance of Critical Regions and Monitors	IV	CO3
3D-9	Explain state IPC paradigms and implementations.	II	CO4
3D-10	What are the models of IPC? Explain it.	I	CO4
3D-11	What is the use of pipes explain with an example?	I	CO4
3D-12	Explain the concept of Inter Process Communication Mechanisms with an example?	II	CO4
3D-13	Difference between Message queue and Shared memory?	III	CO4
3D-14	Explain use of message passing & semaphore for inter process communication?	II	CO4
3D-15	Explain the concept of IPC between processes on different system?	II	CO4

UNIT- IV

OBJECTIVE QUESTIONS

SL.NO		BTLevel	Course Outcome
4C-1	The table contains the base address of each page in physical memory. a) process b) memory c) page d) frame	II	CO5
4C-2	The instruction being executed, must be in _____ a) physical memory b) logical memory c) physical & logical memory d) none of the mentioned	II	CO5
4C-3	The pager concerns with the _____ a) individual page of a process b) entire process c) entire thread d) first page of a process	I	CO5
4C-4	Swap space exists in _____ a) primary memory b) secondary memory c) cpu d) none of the mentioned	I	CO5
4C-5	Effective access time is directly proportional to _____ a) page-fault rate b) hit ratio c) memory access time d) none of the mentioned	I	CO5
4C-6	In FIFO page replacement algorithm, when a page must be replaced a) a) oldest page is chosen b) newest page is chosen c) random page is chosen d) none of the mentioned	I	CO5
4C-7	A process is thrashing if _____ a) it is spending more time paging than executing b) it is spending less time paging than executing c) page fault occurs d) swapping cannot take place	I	CO5
4C-8	Physical memory is broken into fixed-sized blocks called _____ a) frames b) pages c) backing store d) none of the mentioned	II	CO5
4C-9	Every address generated by the CPU is divided into two parts. They are ____ a) frame bit & page number b) page number & page offset c) page offset & frame bit	I	CO5

	d) frame offset & page offset		
4C-10	The _____ table contains the base address of each page in physical memory. a) process b) memory c) page d) frame	I	CO5
4C-11	If the size of logical address space is 2 to the power of m, and a page size is 2 to the power of n addressing units, then the high order _____ bits of a logical address designate the page number, and the _____ low order bits designate the page offset. a) m, n b) n, m c) m – n, m d) m – n, n	I	CO5
4C-12	Time taken in memory access through PTBR is _____ a) extended by a factor of 3 b) extended by a factor of 2 c) slowed by a factor of 3 d) slowed by a factor of 2	I	CO5
4C-13	Which of the following page replacement algorithms suffers from Belady's Anomaly? a) Optimal replacement b) LRU c) FIFO d) Both optimal replacement and FIFO	II	CO5
4C-14	A process refers to 5 pages, A, B, C, D, E in the order : A, B, C, D, A, B, E, A, B, C, D, E. If the page replacement algorithm is FIFO, the number of page transfers with an empty internal store of 3 frames is? a) 8 b) 10 c) 9 d) 7	I	CO5

FILLINTHEBLANKS			
4F-1	The_____shows the frame location for each page of the process.	I	CO5
4F-2	The basic tools of memory management are paging and_____.	I	CO5
4F-3	A_____is an actual location in main memory.	II	CO5
4F-4	A_____is a variable length block of data that resides in secondary memory.	II	CO5
4F-5	A_____is a fixed length block of main memory.	I	CO5
4F-6	An address generated by the CPU is known as a_____.	II	CO5
4F-7	Logical address space also known as a_____.	II	CO5
4F-8	A Physical address is also known as a_____.	I	CO5
4F-9	Main memory is divided into small fixed-sized blocks of (physical) memory called_____.	II	CO5
4F-10	The_____is mapped to the segment table,	II	CO5
4F-11	Paging is used to retrieve processes from_____to primary memory.	I	CO5
4F-12	Smaller page tables are implemented as a set of _____	I	CO5
4F-13	If a page number is not found in the TLB, then it is known as a _____	IV	CO5
4F-14	In paged memory systems, if the page size is increased, then the internal fragmentation generally _____	II	CO5
4F-15	Working set model for page replacement is based on the assumption of _____	III	CO5
MATCHTHEFOLLOWING			
4M-1	1. Paging 2. Segmentation 3. Logical address 4. Physical address 5. Swapping	a. An address seen by the memory unit b. Fixed size blocks c. Roll-out d. Address generated by CPU e. Variable size blocks	I CO5
4M-2	1. First fit 2. Best fit 3. worst fit 4. Logical address 5. Physical address	a. Frame number + Page offset b. Free hole c. Page number+ page offset d. Smallest hole e. Largest hole	III CO5
4M-3	1. Paging 2. Segmentation 3. Demand Paging 4. Page fault 5. Thrashing	a. No internal fragmentation b. Internal fragmentation c. Page hit d. Global page replacement e. External fragmentation	II CO5
4M-4	Match the pairs in the following question. List - I (A) Virtual Memory (B) Shared memory (C) Look-ahead buffer		V CO5

	(D) Look-aside buffer List - II (p) Temporal locality (q) Spatial Locality (r) Address Translation (s) Mutual exclusion		
4M-5	1. Page hit 2. Page fault 3. Virtual memory 4. Cache memory 5. RAID	a. Page allocation & Resource allocation b. Fault tolerance c. Hit ration d. Process are not found e. Process are found	III CO5
5-MARKS QUESTIONS			
4D-1	Briefly explain about segmentation?		II CO5
4D-2	Explain LRU page replacement algorithm with this example.		II CO5
4D-3	Consider the following reference string 7,0,1,2,0,3,0,4,2,3,0,3,2,1,2,0,1,7,0,1 Assume there are three frames. Apply LRU replacement algorithm to the reference string above and find out how many page faults are produced. Illustrate the LRU page replacement Algorithm in detail and also two feasible implementation of the LRU algorithm		III CO5
4D-4	What is paging? Explain the basic method for implementing paging.		III CO5
4D-5	Describe about a)Contiguous memory allocation b)Fragmentation.		II CO5
4D-6	Illustrate about allocation of frames.		III CO5
4D-7	Explain FIFO page replacement algorithm necessary reference string? Consider the following reference string 7,0,1,2,0,3,0,4,2,3,0,3,2,1,2,0,1,7,0,1.		IV CO5
4D-8	Explain the various page replacement strategies.		I CO5
4D-9	What is demand paging and what are its uses?		I CO5
4D-10	Write about the techniques for structuring the page table.		I CO5
4D-11	List the differences between? a)Logical and physical address? b)Page table and segment table? c)First-fit placement and best-fit placement?		III CO5
4D-12	Explain about page replacement algorithms?		I CO5
4D-13	Difference between segmentation paging and demand paging with an example?		V CO5
4D-14	What are the advantages and disadvantages of page replacement algorithms?		I CO5
4D-15	How can the system distinguish between the pages that are in main memory from the pages that are on the disk?		I CO5

UNIT- V

OBJECTIVEQUESTIONS

SL.NO		BT Level	Course Outcome
5C-1	Data cannot be written to secondary storage unless written with in a__ a) file b) swap space c) directory d) text format	II	CO6
5C-2	File attributes consist of _____ a) name b) type c) identifier d) all of the mentioned	I	CO6
5C-3	The information about all files is kept in _____ a) swap space b) operating system c) separate directory structure d) none of the mentioned	I	CO6
5C-4	Which of the following are the two parts of the file name? a) name & identifier b) identifier & type c) extension & name d) type & extension	II	CO6
5C-5	What will happen in the single level directory? a) All directories must have unique names b) All files must have unique names c) All files must have unique owners d) All of the mentioned	II	CO6
5C-6	What is the disadvantage of the two level directory structure? a) It does not solve the name collision problem b) It solves the name collision problem c) It does not isolate users from one another d) It isolates users from one another	II	CO6
5C-7	What is the main problem with access on troll lists? a) their maintenance b) their length c) their permissions d) all of the mentioned	II	CO6
5C-8	Management of metadata information is done by _____ a) file- organization module b) logical file system c) basic file system d) application programs	I	CO6
5C-9	The larger the block size, the _____ the internal fragmentation. a) greater b) lesser c) same d) none of the mentioned	II	CO6

5C-10	To organize file systems on disk _____ a) they are split into one or more partitions b) information about files is added to each partition c) they are made on different storage spaces d) all of the mentioned	II	CO6
5C-11	What will happen in the single level directory? a) All files are contained in different directories all at the same level b) All files are contained in the same directory c) Depends on the operating system d) None of the mentioned	V	CO6
5C-12	Reliability of files can be increased by _____ a) keeping the files safely in the memory b) making a different partition for the files c) by keeping them in external storage d) by keeping duplicate copies of the file	V	CO6
5C-13	By pre allocating the I nodes and spreading them across the volume, we _____ the system performance. a) improve b) decrease c) maintain d) do not affect	VI	CO6
5C-14	To create a new file application program calls _____ a) basic file system b) logical file system c) file-organization module d) none of the mentioned	II	CO6
5C-15	In a tree structure, when deleting a directory that is not empty? a) The contents of the directory are safe b) The contents of the directory are also deleted c) contents of the directory are not deleted d) none of the mentioned	III	CO6
FILL IN THE BLANKS			
5F-1	A file is a/an _____ data type.	I	CO6
5F-2	The operating system keeps a small table containing information about all open files called _____	I	CO6
5F-3	The open file table has a/an _____ associated with each file.	II	CO6

5F-4	The directory can be viewed as a _____ that translates file names into their directory entries.	I	CO6
5F-5	Protection is only provided at the ___ level.	I	CO6
5F-6	Disks are segmented into one or more partitions, each containing a file system or _____	II	CO6
5F-7	In _____ writes ,the data is stored in the cache.	I	CO6
5F-8	The protection domain of a process contains _____	I	CO6
5F-9	The larger the block size ,the _____ the internal fragmentation.	I	CO6
5F-10	To create a new file application program calls _____	I	CO6
5F-11	A tree structure _____ the sharing of files and directories.	I	CO6
5F-12	A tree structure _____ the sharing of files and directories.	I	CO6
5F-13	In UNIX, the file handle consists of a _____ and _____	I	CO6
5F-14	Disks are segmented into one or more partitions, each containing a file system or _____	I	CO6
5F-15	When keeping a list of all the links/references to a file, and the list is empty, implies that _____	II	CO6
MATCH THE FOLLOWING			
5M-1	1. Bitmap 2. Linked list 3. Grouping 4. Counting 5. File allocation table	a. No of disk blocks b. .FAT c. No of free contiguous disk blocks d. Store no of blocks e. 0's & 1's	III CO6
5M-2	1. Read 2. Write 3. Execute 4. Append 5. Delete	a. Writer or rewriting file b. Deleting the file c. Reading from a file d. Loading the file e. writes the new information to the already existing file	V CO6
5M-3	List I A. fork() B. exec() C. kill() D. exit()	List II I. Sends a signal from one process to another process II. Indicates termination of the current process III. Loads the specified program in the memory IV. Creates a child process	V CO6
5M-4	1. FCFS 2. SSTF 3. SCAN 4. CSCAN 5. LOOK	a. The disk arm again scan b. The disk moves in a particular direction c. Shortest seek time first d. First come first serve e. Similar to the SCAN disk scheduling	II CO6

5M-5	1.Application programs 2.Logical file system 3.File organization module 4.I/O control 5. Devices	a .Divided into various logical blocks b. First request is directed to the logical c. CPU monitor d. Module decided which physical block the application e. It can access hard disk	II	CO6
5-MARKS QUESTIONS				
5D-1	Explain about sequential and indexed file access methods.		II	CO6
5D-2	Illustrate layered –file system implementation? Mention the Various file-directory structures.		III	CO6
5D-3	Explain the three allocation methods in file system implementation? Illustrate with proper diagram.		V	CO6
5D-4	Explain i)File sharing ii)Protection.		VI	CO6
5D-5	Explain about access methods?		II	CO6
5D-6	Explain in detail the four approaches to free –space management?		II	CO6
5D-7	Discuss about the access rights and management simultaneous access.		II	CO6
5D-8	Explain disk structure a disk scheduling.		II	CO6
5D-9	Explain swap-space management.		II	CO6
5D-10	Consider the following disk queue with requests for I/O to blocks on cylinders 98,183,37,122,14,124,65,67 in that order, using FCFS algorithm of the disk head is initially at cylinder 53 find the total head movement in cylinders. Also provide the necessary diagram To show the head movement for the above queue.		V	CO6
5D-11	Explain various directory operations in briefly?		II	CO6
5D-12	What is a file? List the various file attributes and file operations?		I	CO6
5D-13	Draw the diagram for tree structured directories and explain it.?		V	CO6
5D-14	What are the advantages and disadvantages of free space management?		I	CO6
5D-15	Explain various system calls for file management system?		III	CO6

PREVIOUS YEAR QUESTION PAPER

MID-1 MODEL PAPER

SRI INDU COLLEGE OF ENGINEERING & TECHNOLOGY

(An Autonomous Institution Under 2(f) and 12(B) of UGC Act 1956, New Delhi)

II B.Tech - I Semester - I Mid Term Examinations (Model paper)

R22CSE2213 - Operating System

Duration: 90Mins

Max Marks: 25M

Section – A	
Answer <u>All</u> the questions	5Qx1M = 5M
1. Define operating systems.	
2. Explain different types of operating system services.	
3. What is distributed systems? What are the different types of distributed systems?	
4. What is meant by Real-Time system?	
5. What are the main objectives of operating system?	
Section – B	
Answer any <u>FOUR</u> questions	4Qx5M = 20M
6. Discuss various components of operating system structure.	
7. Define system calls and explain its types.	
8. Explain in detail about OS services.	

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Recognized under 2(f) and 12(B) of UGC Act 1956

II B.Tech - II Semester - End Examinations (Model paper)

OPERATING SYSTEM

(COMMON TO CSE(AI&ML), CSE(CS))

Duration: 3 Hrs

Max Marks: 70M

Section - A

Answer <u>All</u> the following questions		Marks: 5Qx4M = 20M		
		Marks	Course Outcome	BT Level
1	Name the process states with neat diagram.	4	CO2	3

2	Explain about indexed sequential access.	4	CO5	2
3	Define operating systems.	4	CO1	1
4	What are the methods for handling deadlocks?	4	CO3	1
5	Define swapping & fragmentation.	4	CO4	2
Answer any <u>FIVE</u> questions choosing at least one from each Unit Marks: 5Qx10M = 50M				
		Marks	Course Outcome	BT Level
UNIT-I				
6. Elaborate about operating system operations.				
(OR)				
7. Define the following types of operating systems structure: i) Batch ii) Interactive iii) Time sharing iv) Real time v) Parallel vi) Distributed vii) Handheld.		10	CO1	4,1
UNIT-II				
8. Consider the following four processes, with the length of the CPU burst given in milliseconds.				
Process	Arrival Time	Burst Time		
P1	0	8		
P2	1	4		
P3	2	9	10	CO2
P4	3	5		3,2
Calculate the average waiting time for (i) Pre-emptive SJF schedule (ii) non-pre-emptive SJF schedule.				
(OR)				
9. List the attributes of the process. Describe the typical elements of process control block.				
UNIT – III				
10. a) Explain the steps involved in banker's algorithm. b) Explain about resource request algorithm.				
(OR)				
11. How the deadlocks can be avoided? Explain it with the help of necessary algorithms.		10	CO3	5,1
UNIT – IV				
12. Explain LRU page replacement algorithm with this example. Consider the following reference string 7,0,1,2,0,3,0,4,2,3,0,3,2,1,2,0,1,7,0,1				
(OR)				
		10	CO4	3,1

13. What is paging? Explain the basic method for implementing paging?			
UNIT – V			
14. Illustrate layered-file system implementation? Mention the various file-directory structures. (OR)	10	CO5	2
15. Explain disk structure and disk scheduling			

S.NO	Bloom Taxonomy Level	No. Of. Questions	%	Name & Signature of Paper Setter
1	Fundamental Knowledge from level I & II	5	50	
2	Knowledge on application & Analysis from level III & IV	2	20	
3	Critical thinking and ability to design from level V & VI	3	30	

R22CSE2213 - Operating System
SRIINDUCOLLEGE OF ENGINEERING & TECHNOLOGY
 (An Autonomous Institution under UGC, New Delhi)
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IIB.Tech-II Semester – End Examinations (Model paper)
R22CSE2213 - Operating System
 (COMMON TO CSE(AI&ML), CSE(CS))

Duration: 3 Hrs

Max Marks: 70M

Section - A

Answer <u>All</u> the following questions		Marks: 5Qx4M = 20M		
		Marks	Course Outcome	BT Level
1	Name the process states with neat diagram.	4	CO2	3
2	Explain about indexed sequential access.	4	CO5	2
3	Define operating systems.	4	CO1	1
4	What are the methods for handling deadlocks?	4	CO3	1
5	Define swapping & fragmentation.	4	CO4	2

Section - B

Answer any <u>FIVE</u> questions choosing at least one from each Unit		Marks: 5Qx10M = 50M			
		Marks	Course Outcome	BT Level	
UNIT-I					
6. Elaborate about operating system operations.		10	CO1	4,1	
(OR)					
7. Define the following types of operating systems structure: i) Batch ii) Interactive iii) Time sharing iv) Real time v) Parallel vi) Distributed vii) Handheld.					
UNIT-II					
8. Consider the following four processes, with the length of the CPU burst given in milliseconds.		10	CO2	3,2	
Process	Arrival Time				Burst Time
P1	0				8
P2	1				4
P3	2				9
P4	3	5			
Calculate the average waiting time for (i) Pre-emptive SJF schedule (ii) non-pre-emptive SJF schedule.					
(OR)					
9. List the attributes of the process. Describe the typical elements of					

process control block.			
<p style="text-align: center;">UNIT – III</p> <p>10. a) Explain the steps involved in banker’s algorithm. b) Explain about resource request algorithm. (OR)</p> <p>11. How the deadlocks can be avoided? Explain it with the help of necessary algorithms.</p>	10	CO3	5,1
<p style="text-align: center;">UNIT – IV</p> <p>12. Explain LRU page replacement algorithm with this example. Consider the following reference string 7,0,1,2,0,3,0,4,2,3,0,3,2,1,2,0,1,7,0,1 (OR)</p> <p>13. What is paging? Explain the basic method for implementing paging?</p>	10	CO4	3,1
<p style="text-align: center;">UNIT – V</p> <p>14. Illustrate layered-file system implementation? Mention the various file-directory structures. (OR)</p> <p>15.Explain disk structure an disk scheduling</p>	10	CO5	2

S.NO	Bloom Taxonomy Level	No. Of. Questions	%	Name & Signature of Paper Setter
1	Fundamental Knowledge from level I & II	5	50	
2	Knowledge on application & Analysis from level III & IV	2	20	
3	Critical thinking and ability to design from level V & VI	3	30	

COURSE OUTCOMES (CO's)

Academic Year: 2024-25

Class: II YEAR-II SEM.

Course Name: DATA BASE MANAGEMENT SYSTEMS (R20CSE2203)

At the end of the course, the student will be able to

Course Outcomes (COs)	
C214.1	Understand the basics of instructions sets and their impact on processor design
C214.2	Demonstrate an understanding of the design of the functional units of a digital computer system
C214.3	Evaluate cost performance and design trade-offs in designing and constructing a computer processor Including memory
C214.4	Design a pipeline for consistent execution of instructions with minimum hazards
C214.5	Recognize and manipulate representations of numbers stored in digital computers.
C214.6	Demonstrate the Characteristics of Multiprocessors.

COURSE ARTICULATION MATRIX

CO	PO													
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3
C214.1	3	2	-	-	3	-	2	-	-	-	-	2	3	2
C214.2	3	3	-	2	2	-	-	-	-	-	-	3	3	2
C214.3	3	3	-	2	2	-	2	-	-	-	-	3	3	2
C214.4	3	2	3	2	-	-	2	-	-	-	-	3	2	1
C214.5	3	3	3	3	2	-	-	-	3	-	-	3	3	1
C214.6	3	3	3	3	-	-	2	-	3	-	-	3	3	1
C214	3	2.6	3	2.6	2.2	-	2	-	3	-	-	2.8	2.8	1.5

3: High 2: Medium 1: Low



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 Sheriguda (V), Ibrahimpatnam, R.R. Dist, Hyderabad - 501 510

D4

BR-22

Lr.No.SICET/AUTO/DAE/II B.Tech Academic Calendar/88/2024

B.TECH II-YEAR I-SEM & II-SEM ACADEMIC CALENDAR
(FOR ACADEMIC YEAR : 2024-25)

Academic Calendar for B.Tech – IInd Year Students (2023 - 24 Batch), BR-22 Regulation.

I – Semester

S.No.	EVENT	PERIOD	DURATION
1.	Commencement of class work.	31.07.2024 (Wednesday)	
2.	1 st Spell of Instructions for covering First Two and a half Units.	31.07.2024 – 28.09.2024	8 Weeks 4 Days
3.	I Mid Term Examinations.	30.09.2024 – 05.10.2024	5 Days
4.	Submission of I Mid Term Examination Marks.	09.10.2024	
5.	2 nd Spell of Instructions for Remaining Two and a half Units.	14.10.2024 – 14.12.2024	9 Weeks
6.	II Mid Term Examinations.	16.12.2024 – 18.12.2024	3 Days
7.	Preparation Holidays and Practical Examinations	19.12.2024 – 28.12.2024	1 Week 3 Days
8.	Submission of II Mid Term Examination Marks.	27.12.2024	
9.	I Semester End Examinations.	31.12.2024 – 18.01.2025	3 Weeks
Commencement of Class-Work for II B.Tech - II Semester 20.01.2025 (Monday)			

Note: No of Working/Instructional days : 91

II – Semester

S.No.	EVENT	PERIOD	DURATION
1.	Commencement of class work.	20.01.2025 (Monday)	
2.	1 st Spell of Instructions for covering First Two and a half Units.	20.01.2025 – 22.03.2025	9 Weeks
3.	I Mid Term Examinations.	24.03.2025 – 26.03.2025	3 Days
4.	Submission of I Mid Term Examination Marks.	02.04.2025	
5.	2 nd Spell of Instructions for Remaining Two and a half Units.	27.03.2025 – 10.05.2025	6 Weeks 3 Days
6.	Summer Vacation	12.05.2025 – 24.05.2025	2 Weeks
7.	Continuation of 2 nd Spell of Instructions for Remaining Two and a half Units	26.05.2025 – 11.06.2025	2 Weeks 3 Days
8.	II Mid Term Examinations.	12.06.2025 – 14.06.2025	3 Days
9.	Preparation Holidays and Practical Examinations	16.06.2025 – 21.06.2025	1 Week
10.	Submission of II Mid Term Examination Marks.	19.06.2025	
11.	II Semester End Examinations	24.06.2025 – 07.07.2025	2 Weeks
12.	Commencement of Class-Work for III B.Tech - I Semester	09.07.2025(Wednesday)	

Note: No of Working/Instructional days : 98

ACE

Controller of Examination
Sri Indu College of Engineering & Technology
(An Autonomous Institution Under UGC)
Sheriguda (V), Ibrahimpatnam, R.R. Dist-501510.

DIRECTOR
Sri Indu College of Engineering & Technology
(An Autonomous Institution Under UGC)
Sheriguda (V), Ibrahimpatnam, R.R. Dist-501510.

PRINCIPAL
Sri Indu College of Engineering & Technology
(An Autonomous Institution Under UGC)
Sheriguda (V), Ibrahimpatnam, R.R. Dist-501510.

Sign:
Dr. M.V.S.S. Giridhar
Prof. of CEA, JNTUH Nominee

Sign:
Dr. T. Venu Gopal
Prof. of CSE, JNTUH Nominee

Sign:
Dr. D. Ramesh
Prof. of CSE, JNTUH Nominee

(Copy to DAP&E and Copy to all the Dept. Heads)

DATA BASE MANAGEMENT SYSTEM

SYLLABUS

SRI INDU COLLEGE OF ENGINEERING & TECHNOLOGY

(An Autonomous Institution under UGC, New Delhi)

B.Tech. - II Year – II Semester

L	T	P	C
3	1	0	4

(R22CSE2214) Database Management Systems

Prerequisites

1. A course on -Data Structures

Course Objectives

- To understand the basic concepts and the applications of database systems.
- To master the basics of SQL and construct queries using SQL.
- Topics include data models, database design, relational model, relational algebra, transaction control, concurrency control, storage structures and access techniques.

Course Outcomes:

- Gain knowledge of fundamentals of DBMS, database design and normal forms
- Master the basics of SQL for retrieval and management of data.
- Be acquainted with the basics of transaction processing and concurrency control.
- Familiarity with database storage structures and access techniques

UNIT - I

Database System Applications: A Historical Perspective, File Systems versus a DBMS, the Data Model, Levels of Abstraction in a DBMS, Data Independence, Structure of a DBMS
Introduction to Database Design: Database Design and ER Diagrams, Entities, Attributes, and Entity Sets, Relationships and Relationship Sets, Additional Features of the ER Model, Conceptual Design With the ER Model

UNIT - II

Introduction to the Relational Model: Integrity constraint over relations, enforcing integrity constraints, querying relational data, logical data base design, introduction to views, destroying/altering tables and views.
Relational Algebra, Tuple relational Calculus, Domain relational calculus.

UNIT - III

SQL: QUERIES, CONSTRAINTS, TRIGGERS: form of basic SQL query, UNION, INTERSECT, and EXCEPT, Nested Queries, aggregation operators, NULL values, complex integrity constraints in SQL, triggers and active data bases.

Schema Refinement: Problems caused by redundancy, decompositions, problems related to decomposition, reasoning about functional dependencies, FIRST, SECOND, THIRD normal forms, BCNF, lossless join decomposition, multi-valued dependencies, FOURTH normal form, FIFTH normal form.

UNIT - IV

Transaction Concept, Transaction State, Implementation of Atomicity and Durability, Concurrent Executions, Serializability, Recoverability, Implementation of Isolation, Testing for serializability, Lock Based Protocols, Timestamp Based Protocols, Validation- Based Protocols, Multiple Granularity, Recovery and Atomicity, Log-Based Recovery, Recovery with Concurrent Transactions.

UNIT - V

Data on External Storage, File Organization and Indexing, Cluster Indexes, Primary and Secondary Indexes, Index data Structures, Hash Based Indexing, Tree base Indexing, Comparison of File Organizations, Indexes and Performance Tuning, Intuitions for tree Indexes, Indexed Sequential Access Methods (ISAM), B+ Trees: A Dynamic Index Structure.

TEXT BOOKS:

1. Database Management Systems, Raghurama Krishnan, Johannes Gehrke, Tata Mc Graw Hill 3rd Edition
2. Database System Concepts, Silberschatz, Korth, *Mc Graw hill*, V edition.

REFERENCE BOOKS:

1. Database Systems design, Implementation, and Management, Peter Rob & Carlos Coronel 7th Edition.
2. Fundamentals of Database Systems, Elmasri Navrate, Pearson Education
3. Introduction to Database Systems, C. J. Date, Pearson Education
4. Oracle for Professionals, The X Team, S.Shah and V. Shah, SPD.
5. Database Systems Using Oracle: A Simplified guide to SQL and PL/SQL, Shah, PHI.
6. Fundamentals of Database Management Systems, M. L. Gillenson, Wiley Student Edition.



SRI INDU COLLEGE OF ENGG & TECH
LESSON PLAN
 (Regulation: R22)
 Department of IT

Prepared
 on
 Rev1:
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Sub. Code & Title **R22CSE2214 & DATA BASE MANAGEMENT SYSTEMS**

Academic Year: 2022-23 **Year/Sem./Section** **II-II-IT**

Faculty Name & Designation **Mrs.Hemalatha.J, Assistant Professor**

Unit/ Item No.	Topic (s)	Book Referenc e	Page (s)		Teaching Methodolog y	Propose dNo. of Periods	Actual Date ofHandling	CO/RBT	
			From	To					
UNIT-I									
I	DATABASE SYSTEM APPLICATIONS					13			
1.1	Introduction, Database System Applications	T1	3	5	Black board	01		CO1/L1	
1.2	A Historical Perspective	T1	6	7	Black board	01		CO1/L1	
1.3	File Systems versus a DBMS	T1	8	8	Black board	01		CO1/L1	
1.4	The Data Model	T1	11	11	Black board	01		CO1/L1	
1.5	Levels of Abstraction in a DBMS	T1	12	14	Black board	01		CO1/L1	
1.6	Data Independence, Structure of a DBMS	T1	15	16	Presentation	01		CO1/L6	
1.7	Database Design and ER Diagrams	T1	26	28	Presentation	01		CO1/L6	
1.8	Entities, Attributes, and Entity Sets	T1	28	29	Presentation	01		CO1/L6	
1.9	Relationships and Relationship Sets	T1	29	32	Black board	01		CO1/L6	
1.10	Additional Features of the ER Model	T1	32	40	Black board	02		CO1/L6	
1.11	Conceptual Design With the ER Model	T1	40	45	Black board	02		CO1/L6	
	Review	Signature of the HOD/Coordinator							
Unit/ Item No.	Topic (s)	Book Referenc e	Page (s)		Teaching Methodolog y	Propose dNo. of Periods	Actual Date ofHandling	CO/RBT	
UNIT II									
II	INTRODUCTION TO THE RELATIONAL MODEL					12			
2.1	Introduction to the Relational Model	T1	59	63	Black board	1		CO2/L1	
2.2	Integrity constraint over relations,	T1	63	68	Black board	1		CO2/L1	
2.3	Enforcing integrity constraints	T1	69	73	Black board	2		CO2/L2	
2.4	Querying relational data	T1	73	74	Black board	1		CO2/L2	
2.5	Logical data base design	T1	74	86	Black board	1		CO2/L2	
2.6	Introduction to views, destroying/altering tables and views	T1	86	91	Black board	2		CO2/L2	
2.7	Relational Algebra	T1	102	116	Black board	1		CO2/L2	
2.8	Tuple relational Calculus	T1	116	122	Presentation	2		CO2/L2	
2.9	Domain relational calculus	T1	122	124	Presentation	1		CO2/L2	
	Review	Signature of the HOD/Coordinator							



SRI INDU COLLEGE OF ENGG & TECH
LESSON PLAN
 (Regulation: R22)
 Department of IT

Prepared
 on
 Rev1:
 Page: 11 of 6

Sub. Code & Title **R22CSE2214 & DATA BASE MANAGEMENT SYSTEMS**

Academic Year: 2022-23 **Year/Sem./Section** **II-II-IT**

Faculty Name & Designation **Mrs.Hemalatha.J, Assistant Professor**

Unit/ Item No.	Topic(s)	Book Referenc e	Page (s)		Teaching Methodol ogy	Proposed No. of Periods	Actual Date of Handled	CO/RBT		
			From	To						
UNIT-III										
III	SQL: QUERIES, CONSTRAINTS, TRIGGERS					12				
3.1	Introduction	T1	131	132	Black board	1		CO2/L2		
3.2	Form of basic SQL query	T1	133	141	Black board	1		CO2/L2		
3.3	UNION, INTERSECT, and EXCEPT	T1	141	144	Black board	1		CO2/L2		
3.4	Nested Queries, Aggregation operators	T1	144	162	Black board	1		CO2/L2		
3.5	NULL values, complex integrity constraints in SQL	T1	162	168	Black board	1		CO2/L2		
3.6	Triggers and active data bases	T1	168	171	Black board	1		CO2/L2		
3.7	Schema Refinement : Problems caused by redundancy	T1	605	608	Black board	1		CO2/L2		
3.8	Decompositions, Problems related to decompositions	T1	608	610	Black board	1		CO2/L2		
3.9	Reasoning about functional dependencies	T1	611	612	Black board	1		CO2/L2		
3.10	FIRST, SECOND, THIRD normal forms, BCNF	T1	615	619	Presentation	1		CO1/L1		
3.11	lossless join decomposition, , multi-valued dependencies	T1	619	622	Presentation	1		CO2/L1		
3.12	FOURTH normal form, FIFTH normal form	T1	636	640	Presentation	1		CO1/L1		
	Review	Signature of the HOD/Coordinator								
Unit/ Item No	Topic(s)	Book Referenc e	Page (s)		Teachi ng Methodol ogy	Proposed No. of Periods	Actual Date of Handled	CO/RBT		
From	To	UNIT-IV								
IV	TRANSACTION MANAGEMENT					12				
4.1	Introduction to Transaction Concept, Transaction State	T1	520	520	Black board	1		CO3/L3		
4.2	Implementation of Atomicity and Durability	T1	521	522	Black board	1		CO3/L3		
4.3	Concurrent Executions, Serializability, Recoverability, Implementation of isolation	T1	524	530	Black board	1		CO3/L3		
4.4	Testing for serializability, Lock Based Protocols	T1	550	555	Black board	2		CO3/L3		
4.5	Timestamp Based Protocols, Validation-Based Protocols	T1	569	572	Presentation	2		CO3/L3		
4.6	Multiple Granularity, Recovery and Atomicity	T1	572	576	Presentation	2		CO3/L3		



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Sub. Code & Title **R22CSE2214 & DATA BASE MANAGEMENT SYSTEMS**

Academic Year: 2022-23 **Year/Sem./Section** **II-II-IT**

Faculty Name & Designation **Mrs.Hemalatha.J, Assistant Professor**

4.7	Log-Based Recovery	T1	582	583	Black board	1		CO3/L3
4.8	Recovery with Concurrent Transactions	T1	583	585	Presentation	1		CO3/L3
	Review	Signature of the HOD/Coordinator						
Unit/	Topic(s)	Book	Page (s)		Teaching	Proposed	Actual Date of	CO/RBT
Item No		Reference	From	To	Methodology	No. of Periods	Handled	
UNIT-V								
V	OVERVIEW ON FILE ORGANIZATION AND INDEXING					11		
5.1	Data on External Storage	T1	274	275	Black board	1		CO4/L3
5.2	File Organization and Indexing	T1	275	276	Black board	1		CO4/L4
5.3	Cluster Indexes, Primary and Secondary Indexes	T1	277	278	Black board	1		CO4/L4
5.4	Index data Structures, Hash Based Indexing	T1	278	279	Black board	1		CO4/L3
5.5	Tree base Indexing, Comparison of File Organizations	T1	280	291	Presentation	1		CO4/L4
5.6	Indexes and Performance Tuning	T1	291	299	Presentation	2		CO4/L4
5.7	Intuitions for tree Indexes, Indexed Sequential Access Methods (ISAM)	T1	339	344	Black board	2		CO4/L3
5.8	B+ Trees: A Dynamic Index Structure	T1	344	346	Black board	2		CO4/L3
	Review	Signature of the HOD/Coordinator						

LIST OF TEXT BOOKS AND REFERENCES

TEXT BOOKS:

1. Database Management Systems, Raghurama Krishnan, Johannes Gehrke, *Tata Mc Graw Hill* 3rd Edition
2. Database System Concepts, Silberschatz, Korth, *Mc Graw hill*, V edition.

REFERENCES:

1. Database Systems design, Implementation, and Management, Peter Rob & Carlos Coronel 7th Edition.
2. Fundamentals of Database Systems, Elmasri Navrate, *Pearson Education*
3. Introduction to Database Systems, C. J. Date, *Pearson Education*
4. Oracle for Professionals, The X Team, S.Shah and V. Shah, *SPD*.
5. Database Systems Using Oracle: A Simplified guide to SQL and PL/SQL, Shah, *PHI*.
 Fundamentals of Database Management Systems, M. L. Gillenson, *Wiley Student*



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Weblinks:

1. <https://youtu.be/OWX4RvijwLw?list=PL3pGy4HtqwD3Ov1J2UBTfsLgxUzUktTAM>
2. <https://nptel.ac.in/courses/106/105/106105175/>
3. <https://youtu.be/DRSog3SA4-Y?list=PL3pGy4HtqwD3Ov1J2UBTfsLgxUzUktTAM>
4. https://youtu.be/zCa6DJTjkhg?list=PL-zLo58JCM3BkfC_wlAosP5VTLV9ObiW1
5. https://youtu.be/zCa6DJTjkhg?list=PL-zLo58JCM3BkfC_wlAosP5VTLV9ObiW1

List of Power Point Presentations

S.No	Topic Name	No. Of Slides
1		
2		

CONTENT BEYOND THE SYLLABUS

S.No	Topics	Proposed Actions	Date	Resource Person/Mode	Pos	PSOs
1		Class room(2 Periods)			PO1,PO2,PO3	PSO1,PSO2
2		Class room(2 Periods)			PO1,PO2,PO3	PSO1,PSO2



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Academic Year: 2022-23	Year/Sem./Section	II-II-IT	
Faculty Name & Designation	Mrs.Hemalatha.J, Assistant Professor		

ASSIGNMENT QUESTIONS MID-I & II

S.No	Assignment Questions	Course Outcome	Books To be Referred	Date Of Announcement	Date Of Submission
1	Describe the Structure of DBMS?	CO1	T1	29/04/2022	06/05/2022
2	Discuss additional features of the ER-Models.	CO1	T1	29/04/2022	06/05/2022
3	Define trigger and explain its three parts? Differentiate row level and statement level triggers?	CO1	T1	29/04/2022	06/05/2022
4	Define a nested query? Write a nested query to find the names of sailors who have reserved both a red and green boat?	CO1	T1	29/04/2022	06/05/2022
5	Define normalization? Explain 1NF, 2NF, 3NF Normal forms?	CO2	T1	29/04/2022	06/05/2022
6	Discuss about Join dependencies and Fifth normal form?	CO2	T1		
7	Explain ACID properties and Illustrate them through examples?	CO3	T1		
8	Explain different types of Advanced Recovery Techniques?	CO3	T1		
9	Write in detail about Hash based Indexing and Tree based Indexing?	CO4	T1		
10	Explain B+ trees? Discuss about this Dynamic Index Structure?	CO4	T1		

SELF STUDY
TOPICS

S.No	Topics	Books & Journals	Course Outcome
1			
2			

Prepared by	Recommended and Approved by
J.Hemalatha (Signature & Name)	HOD/IT

ASSIGNMENT

S.No.	Assignment Questions	Course Outcome	Books To be Referred	Date of Announcement	Date of submission
1	Describe the Structure of DBMS?	CO1	T1	29/04/2022	06/05/2022
2.	Discuss additional features of the ER-Models.	CO1	T1	29/04/2022	06/05/2022
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5.	Define normalization? Explain 1NF, 2NF, 3NF Normal forms?	CO2	T1	29/04/2022	06/05/2022
6.	Discuss about Join dependencies and Fifth normal form?	CO2	T1		
7.	Explain ACID properties and Illustrate them through examples?	CO3	T1		
8.	Explain different types of Advanced Recovery Techniques?	CO3	T1		
9.	Write in detail about Hash based Indexing and Tree based Indexing?	CO4	T1		
10.	Explain B+ trees? Discuss about this Dynamic Index Structure?	CO4	T1		

SELF STUDY TOPICS

S.No.	Topics	Books & Journals	Course Outcomes
1			
2			

QUESTION BANK WITH BLOOMS TAXONOMY LEVEL (BTL)

(1. Remembering 2. Understanding 3. Applying 4. Analyzing 5. Evaluating 6. Creating)

UNIT-1 : DATABASE SYSTEM APPLICATIONS

Multiple choice Questions

		BT Level	Course Outcome
1C-1	In the relational modes, cardinality is termed as: (A) Number of tuples. (B) Number of attributes. (C) Number of tables. (D) Number of constraints	L1	CO1
1C-2	The view of total database content is (A) Conceptual view. (B) Internal view. (C) External view. (D) Physical View.	L1	CO1
1C-3	Architecture of the database can be viewed as (A) two levels. (B) four levels. (C) three levels. (D) one level.	L3	CO1
1C-4	An entity set that does not have sufficient attributes to form a primary key is a (A) strong entity set. (B) weak entity set. (C) simple entity set. (D) primary entity set.	L1	CO1
1C-5	In an E-R diagram attributes are represented by (A) rectangle. (B) square. (C) ellipse. (D) triangle.	L1	CO1

1C-6	The relational model feature is that there (A) is no need for primary key data. (B) is much more data independence than some other database models. (C) are explicit relationships among records. (D) are tables with many dimensions	L1	CO1
------	---	----	-----

1C-7	<p>Conceptual design</p> <p>(A) is a documentation technique.</p> <p>(B) needs data volume and processing frequencies to determine the size of the database.</p> <p>(C) involves modelling independent of the DBMS.</p> <p>(D) is designing the relational model.</p>	L1	CO1
1C-8	<p>The DBMS language component which can be embedded in a program is</p> <p>The data definition language (DDL).</p> <p>The data manipulation language (DML).</p> <p>The database administrator (DBA).</p> <p>A query language.</p>	L1	CO1
1C-9	<p>A relational database developer refers to a record as</p> <p>(A) a criteria. (B) a relation.</p> <p>(C) a tuple. (D) an attribute</p>	L1	CO1
1C-10	<p>In a Hierarchical model records are organized as</p> <p>(A) Graph. (B) List.</p> <p>(C) Links. (D) Tree.</p>	L1	CO1
1C-11	<p>The way a particular application views the data from the database that the application uses is a</p> <p>(A) module. (B) relational model.</p> <p>(C) schema. (D) sub schema.</p>	L1	CO1
1C-12	<p>Data independence means</p> <p>(A) data is defined separately and not included in programs.</p> <p>(B) programs are not dependent on the physical attributes of data.</p> <p>(C) programs are not dependent on the logical attributes of data.</p> <p>(D) both (B) and (C).</p>	L5	CO1
1C-13	<p>E-R model uses this symbol to represent weak entity set ?</p>	L1	CO1

	(A) Dotted rectangle. (B) Diamond (C) Doubly outlined rectangle (D) None of these		
1C-14	The conceptual model is (A) dependent on hardware. (B) dependent on software. (C) dependent on both hardware and software . (D)independent of both hardware and software	L1	CO1
1C-15	What is a relationship called when it is maintained between two entities? (A) Unary (B) Binary (C) Ternary (D) Quaternary	L1	CO1
1F-1	_____ can help us detect poor E-R design.	L1	CO1
1F-2	The possible inputs for the database are collected by_____	L1	CO1
1F-3	The process of identifying the object and relationships between them is called_____	L1	CO1
1F-4	Graphically representations of the relationship between the entities are_____	L2	CO1
1F-5	The entity is represented in the E-R diagram_____	L1	CO1
1F-6	The attribute is represented in the E-R diagram by_____	L1	CO1
1F-7	The diamond shape is represented in an E-R diagram_____	L1	CO1
1F-8	In the ERD model the entity related to itself is referring to_____	L1	CO1
1F-9	The entity and their relationship in an E-R diagram is represented by_____	L4	CO1
1F-10	Person, Parts, chair, table, teacher are example of_____	L2	CO1
1F-11	The example of a one-to-one relationship is_____	L2	CO1
1F-12	The representation of an optional relationship is_____	L4	CO1
1F-13	The major objective of the Database designs is_____	L4	CO1
1F-14	The——component of the physical database design refers to the correctness and consistency of data.	L1	CO1
1F-15	The database organizing on secondary storage is related to_____	L2	CO1

1M-1	Column 'A' (1) Database (2) Data (3) Information (4) DBMS	Column 'B' (A) Raw facts (B) Creating and managing database (C) Collection of interrelated data (D) Processed data	L1	CO1
1M-2	(1) Advantages of DBMS (2) Data integrity consistent (3) Data Security Redundancy (4) Backup and Recovery database	(A) Authorised users (B) Data is accurate and (C) Reducing Data (D) Restores the database	L1	CO1
1M-3	(1) CHAR integer values (2) VARCHAR (3) DECIMAL length string (4) INT string	(A) It is used for storing (B) It can represent numbers (C) Holds a variable-length string (D) Holds a fixed-length string	L1	CO1
1M-4	(1) RDBMS Relational database (2) Table interrelated data (3) Database designer (4) Record and titles of Columns	(A) storage unit in a (B) Collection of (C) Tuple (D) Decides the name of tables	L1	CO1
1M-5	(1) Data Model format (2) Relational Data Model database (3) Hierarchical Data Model Graph format (4) Relational data model Tree format	(A) Represents data in Table (B) Logical structure of (C) Represents data in (D) Represents data in	L1	CO1
1D-1.	Compare and Contrast file Systems with database systems?		L2	CO1
1D-2.	Write short notes on history of DBMS?		L6	CO1
1D-3.	Explain briefly about Data Abstraction and discuss levels of Abstraction?		L2	CO1
1D-4.	Describe the Structure of DBMS?		L1	CO1
1D-5.	Discuss additional features of the ER-Models.		L1	CO1
1D-6.	Explain briefly about database design steps?		L1	CO1
1D-7.	Distinguish strong entity set with weak entity set? Draw an ER diagram to illustrate weak entity set?		L1	CO1
1D-8	Explain different types of database users and write the functions of DBA?		L2	CO1
1D-9	Discuss about the Concept Design with the ER Model?		L4	CO1

1D-10	Explain briefly about Data models?	L2	CO 1
1D-11	Discuss the various DDL, DML commands with illustrations in SQL. Why are null values not preferred in a relation? Write the advantages of linked lists. Write an algorithm to insert and delete a node in single linked list.	L1	CO1
1D-12	Write about the conceptual design of University with an ER Diagram?	L2	CO 1
1D-13	Give details about different Object based Data Models AND Record bases Logical Models?	L4	CO 1
1D-14	Give details about the levels of View of Data?	L1	CO 1
1D-15	Compare Entity Vs Relationships?	L1	CO 1

**UNIT-II: INTRODUCTION TO
RELATIONAL MODEL**

Multiple choice Questions		BTLevel	Course Outcome
2C-1	Relational calculus is a (A) Procedural language. (B) Non- Procedural language. (C) Data definition language. (D) High level language.	L1	CO2
2C-2	Cartesian product in relational algebra is (A) a Unary operator. (B) a Binary operator. (C) a Ternary operator. (D) not defined.	L1	CO2
2C-3	In case of entity integrity, the primary key may be (A) not Null (B) Null (C) both Null & not Null. (D) any value.	L1	CO2
2C-4	In tuple relational calculus $P1 \oplus P2$ is equivalent to (A) $\neg P1 \cup P2$ (B) $P1 \cup P2$ (C) $P1 \cap P2$ (D) $P1 \cap \neg P2$	L1	CO2
2C-5	Relational Algebra is (A) Data Definition Language. (B) Meta Language (C) Procedural query Language	L1	CO2

	(D) None of the above		
2C-6	Q.7 Key to represent relationship between tables is called (A) Primary key (B) Secondary Key (C) Foreign Key (D) None of these	L1	CO2
2C-7	-----produces the relation that has attributes of R1 and R2 (A) Cartesian product (B) Difference (C) Intersection (D) Product	L1	CO2
2C-8	In a relation (A) Ordering of rows is immaterial (B) No two rows are identical (C) (A) and (B) both are true (D) None of these	L1	CO2
2C-9	What is a relationship called when it is maintained between two entities? (A) Unary (B) Binary (C) Ternary (D) Quaternary	L1	CO2
2C-10	Which of the following is another name for weak entity? (A) Child (B) Owner (C) Dominant (D) All of the above	L1	CO2
2C-11	Which of the following is record based logical model? (A) Network Model (B) Object oriented model (C) E-R Model (D) None of these	L2	CO2
2C-12	Q.8 A primary key if combined with a foreign key creates (A) Parent-Child relationship between the tables that connect them. (B) Many to many relationships between the tables that connect them. (C) Network model between the tables that connect them.	L2	CO2

	(D) None of the above		
2C-13	The database schema is written in A) HLL (B) DML (C) DDL (D) DCL	L2	CO2
2C-14	represents the overall design of database. (A) Instance (B) Schema (C) Metadata (D) Data dictionary	L2	CO2
2C-15	Which of the following is a foreign key constraint? a) Referential integrity b) Domain integrity c) Entity integrity d) All	L2	CO2
Fill in the blanks			
2F-1	Tables with rows and columns can be viewed as _____	L1	CO2
2F-2	row in a table also known as _____	L2	CO2
2F-3	column in a table is contains _____	L2	CO2
2F-4	In ____, there are a set of possible atomic values that apply to an attribute.	L1	CO2
2F-5	In ____, columns in a particular table are listed by their names.	L3	CO2
2F-6	The relational algebra query language is ____	L2	CO2
2F-7	In Relational Algebra, queries are performed using ____.	L2	CO2
2F-8	Using the select operation, you can select ____ that satisfy certain criteria	L1	CO2
2F-9	Select operation is denoted by _____	L2	CO2
2F-10	Propositional logic is conducted using p as a formula, using connectors like _____	L1	CO2
2F-11	A list of the attributes we wish to appear in the result is displayed in ____ operation.	L2	CO2
2F-12	What is Project Operation denoted by _____	L3	CO2
2F-13	If there are 2 types of tuples, A & B, the _____ operation contains all the tuples that are either in A or B or both in A & B.	L2	CO2
2F-14	Union operation eliminates the _____ tuples.	L1	CO2

2F-15	Union operation is denoted by _____	L1	CO2	
Match the following				
2M-1	(1) Primary Key identifies the record (2) Foreign Key to Primary Key (3) Composite Key	(A) Two or m (B) Uniquely (C) Refer	L1	CO2
2M-2	(1) DDL Delete, Update (2) DCL Create, Drop Alter (3) DML Grant, Revoke	(A) Insert, (B) (C)	L1	CO2
2M-3	(1) DROP Deletes rows of the table (2) DELETE Deletes complete data from the table (3) TRUNCATE Deletes complete structure of the table	(A) (B) (C) Deletes	L1	CO2
2M-4	(1) Selection Selects Column data from the relation (2) Projection Duplicate names to attributes (3) Rename Selects the required tuples from the relation	(A) (B) (C)	L1	CO2
2M-5	(1) INNER JOIN table and matching in right table (2) RIGHT JOIN the records matching in left or right tables (3) LEFT JOIN Retrieves records matching in both tables (4) OUTER JOIN Retrieves all records from right table and matching in left table	(A) Retrieves all (B) Retrieves all (C) (D)	L1	CO2

**5-
MARKSQUESTIONS**

2D-1.	Illustrate different set operations in Relational algebra with an example?	L2	CO2
2D-2.	Discuss the reasons for converting SQL queries into relational algebra queries before optimization is done.	L1	CO2
2D-3.	Write about views and updates on views?	L1	CO2
2D-4.	Discuss about integrity constraints over relations?	L 3	CO2
2D-5.	List the table modification commands in SQL?	L	CO2

		2	
2D-6.	Discuss about the operators SELECT, PROJECT, UNION?	L 2	CO2
2D-7.	Discuss about the operators renaming, joins, division?	L 1	CO2
2D-8	Demonstrate how to add a NOT NULL column to a table with example?	L 1	CO2
2D-9	Write briefly about logical database design?	L 2	CO2
2D-10	a. Explain relational calculus? b. Write a TRC query to find the names of sailors who have reserved boat 103? c. Write a DRC query to find the names of sailors who have reserved boat 103?	L 2	CO2
2D-11	What are the different Aggregate Operations in SQL and What are the Complex Integrity Constraints in SQL?	L 2	CO2
2D-12	14) Consider the relation scheme Emp Dept(Ename, SSN, Bdate, Address, Dnumber, Dname, DMGRSSN) and the following set of FD's F={ SSN- > Ename,Bdate, Address, Dnumber Dnumber- > Dname, DMGRSSN} Calculate the closer {SSN}+ and {Dnumber}+ with respect to F.	L 4	CO2
2D-13	Enlighten the process of Enforcing Integrity Constraints using an Update operation?	L1	CO2
2D-14	Illuminate the types of Joins with an example ?	L 4	CO2
2D-15	Give details about the roles of Triggers and Active Databases?	L 2	CO2

UNIT-III QUERIES, CONSTRAINTS, TRIGGERS.

Multiple choice Questions

		BT Level	Course Outcom
3C-1	Which of the following normal form deals with the anomaly of multivalued dependency? a) 1NF b) 2NF c) 4NF d) 5NF	L1	CO3
3C-2	A-----is a special kind of a stored procedure that executes in response to certain action on the table like insertion, deletion or updation of data. a) Procedures b) Triggers c) Functions d) one of the mentioned	L1	CO3
3C-3	The default extension for an Oracle SQL*Plus file is: a) .txt b) .pls c) .ora d) .sql	L1	CO3
3C-4	Which of the following is not a class of constraint in SQL Server? a) NOT NULL b) CHECK c) NULL d) UNIQUE	L6	CO3

3C-5	Which of the following is a foreign key constraint? a) Referential integrity b) Domain integrity c) Entity integrity d) All	L3	CO3
3C-6	Which of the following are the types of integrity constraints enforced by RDBMS? a) Entity integrity b) Domain integrity c) Referential integrity d) All	L1	CO3
3C-7	Point out the correct statement. a) CHECK constraints enforce domain integrity b) UNIQUE constraints enforce the uniqueness of the values in a set of columns c) In a UNIQUE constraint, no two rows in the table can have the same value for the columns d) All of the mentioned	L1	CO4
3C-8	Which of the following constraint does not enforce uniqueness? a) UNIQUE b) Primary key c) Foreign key d) None of the mentioned	L1	CO4
3C-9	Observe the following query and choose the correct option SELECT DISTINCT name FROM student WHERE ID IS NOT NULL; a) The query is syntactically wrong b) The query gives all the possible student names where a finite value exists for ID c) The query gives the names of the students that have a null ID and it also excludes identical names d) The query gives the student names where a finite value exists for ID and it excludes identical names	L2	CO4
3C-10	Purpose of foreign key constraint in SQL Server is _____ a) FOREIGN KEY constraints identify and enforce the relationships between tables b) A foreign key in one table points to a candidate key in another table c) You cannot insert a row with a foreign key value, except NULL, if there is no candidate key with that value d) None of the mentioned	L1	CO3
3C-11	Which of the following is not a foreign key constraint? a) NO ACTION b) CASCADE c) SET NULL d) All of the mentioned	L1	CO4
3C-12	What does UNION operator do in a SQL Server statement? a) Bring common data from the listed tables. b) Bring data which is not common from the listed tables. c) Bring all data from the listed tables. d) Bring all distinct from the listed tables	L4	CO4
3C-13	Which one is correct syntax for applying UNION operator? a) SELECT column_name(s) FROM table_name1 UNION table_name2 b) SELECT column_name(s) FROM table_name1 UNION	L1	CO4

	SELECT column_name(s) FROM table_name2 c) UNION SELECT column_name(s) FROM table_name1 SELECT column_name(s) FROM table_name2 d) SELECT FROM table_name1 AND table_name2		
3C-14	How can we get all records (redundant as well as non-redundant) from union operator? a) Using 'ALL' operator with UNION. b) Using 'Distinct' operator with UNION. c) We get all records (redundant as well as non-redundant) with UNION operator by default. d) None of the above	L3	CO4
3C-15	What is the function of the intersect operation? a) It returns the intersection of the results of the results of any two different queries b) It returns the intersection of the results of two different queries which have the same set of attributes in the select clause c) It returns the intersection of the results of two different queries which have the same condition in the where clause d) None of the mentioned	L6	CO3
3C-16	What is the function of the except operation? a) It excludes all the results present in both the queries b) It includes the results of the second query but excludes the results of the first query c) It includes the results of the first query but excludes the results of the second query d) It includes all the results of both queries but removes duplicates	L1	CO3

Fill in the blanks

3F-1	Constraints can be applied on _____	L4	CO3
3F-2	A condition is referred to as _____	L1	CO4
3F-3	A functional dependency is a relationship between _____	L4	CO4
3F-4	A ____ is normalized after it has been organized.	L1	CO3
3F-5	The database design prevents some data from being stored due to _____.	L3	CO3
3F-6	By normalizing relations or sets of relations, one minimizes ____.	L6	CO4
3F-7	When the _____ the backup site takes over processing and becomes the primary.	L3	CO4
3F-8	A relation is in 2NF if: _____	L2	CO4
3F-9	4NF is designed to cope with _____	L1	CO4
3F-10	A BCNF is _____	L4	CO3
3F-11	Redundancy is reduced in a database table by using the ____ form.	L1	CO4
3F-12	When a relation contains an atomic value, it is a ____ relation.	L1	CO3
3F-13	2NF relations are those that are in 1NF with all the attribute types dependent on the ____ key.	L3	CO3
3F-14	A relation is in ____ if it is in Boyce Codd normal form and does not have any multivalued dependencies.	L4	CO4
3F-15	If a relation has a 4NF and no join dependency, and when it joins, it should be____, it is considered 5NF.	L4	CO4

Match the following

3M-1	(1) Functional Dependency (2) Normalisation (3) Decomposition	(A) Process of organising data in database (B) Splitting of relation into sub relations (C) Constraints on set of relations	L1	CO3
3M -2	(1) 1NF (2) 2NF (3) 3NF (4) 4NF	(A) No non trivial multi valued dependencies (B) No transitive dependencies (C) No multiple values (D) No partial dependencies	L1	CO3
3M -3	(1) COUNT () (2) MIN () (3) AVG () (4) SUM ()	(A) Calculates the sum of selected numeric columns (B) Calculates the average of selected numeric column (C) Number of rows in a table (D) Finds the minimum value from the selected column	L1	CO3
3M -4	(1) EXISTS (2) SOME (3) UNIQUE (4) BETWEEN	(A) Distinctly identifies the row in a relation (B) Checks the value with in the give range of values (C) Checks for existence of the result of a sub query (D) Checks for the value with in given set of values	L1	CO4
3M -5	(1) NOT NULL (2) DEFAULT (3) CHECK (4) UNIQUE	(A) Specified column must have the value falling in specified range (B) Ensures column values to be unique (C) Default values are set for a specified column (D) Column values should not be NULL	L1	CO4

5 - MARKS QUESTIONS

3D-1.	Explain About Functional Dependencies?	L1	CO3
3D-2.	What are the problems caused by redundancy?	L2	CO3
3D-3.	What are the problems caused by redundancy?	L1	CO3
3D-4.	Discuss scheme refinement in database design?	L1	CO3
3D-5.	Write about lossless join decomposition?	L2	CO4
3D-6.	Compare the BCNF and IV Normal form?	L1	CO4
3D-7.	List and Explain the inference rules for Functional dependencies?	L2	CO4
3D-8	Define Redundancy? And how does it address redundancy? Discuss the problems that may be caused by redundancy?	L3	CO4
3D-9	What is normalization? Explain the process of normalization with suitable examples.	L1	CO3
3D-10	Explain About properties of decomposition ?	L2	CO3
3D-11	Explain about aggregation operators?	L1	CO3
3D-12	Explain about complex integrity constraints over SQL?	L1	CO4
3D-13	EXPLAIN TRIGGER? With example.	L1	CO4
3D-14	a. Explain about a nested query and correlated nested queries? b. Write a nested query to find the names of sailors who have reserved both a red and green boat? c. Write a nested query to find the names of sailors who have reserved all boats?	L4	CO4

3D-15	Illustrate Multivalued dependencies and Fourth normal form with example?		
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UNIT – IV TRANCACTION CONCEPTS

OBJECTIVE TYPE QUESTIONS		BT Level	Course Outcome
4C-1	Collections of operations that form a single logical unit of work are called _____ a) Views b) Networks c) Units d) Transactions	L1	CO5
4C-2	Which of the following is a property of transactions? a) Atomicity b) Durability c) Isolation d) All of the mentioned	L3	CO5
4C-3	Execution of transaction in isolation preserves the _____ of a database a) Atomicity b) Consistency c) Durability d) All of the mentioned	L3	CO5
4C-4	The execution sequences in concurrency control are termed as _____ a) Serials b) Schedules c) Organizations d) Time tables	L2	CO5
4C-5	The scheme that controls the interaction between executing transactions is called as _____ a) Concurrency control scheme b) Multiprogramming scheme c) Serialization scheme d) Schedule scheme	L1	CO5
4C-6	Which of the following cannot be used to implement a timestamp a) System clock b) Logical counter c) External time counter d) None of the mentioned	L3	CO5
4C-7	W-timestamp(Q) denotes? a) The largest timestamp of any transaction that can execute write(Q) successfully b) The largest timestamp of any transaction that can execute read(Q) successfully c) The smallest timestamp of any transaction that can execute write(Q) successfully d) The smallest timestamp of any transaction that can execute read(Q) successfully	L3	CO5
4C-8	A schedule is _____ if it is conflict equivalent to a serial schedule. a) Conflict serializable b) Conflicting c) Non serializable d) None	L1	CO5
4C-9	The set of _____ in a precedence graph consists of all the transactions participating in the schedule a) Vertices b) Edges c) Directions d) None of the mentioned	L3	CO5
4C-10	I and J are _____ if they are operations by different transactions on the same data item, and at least one of them is a write operation. a) Conflicting b) Overwriting c) Isolated d) Durable	L1	CO5

4C-11	_____ rolls back all transactions that were incomplete at the time of crash. a) Analysis pass b) Redo pass c) Undo pass d) None of the mentioned	L5	CO5
4C-12	The backup is taken by a) Erasing all previous records b) Entering the new records c) Sending all log records from primary site to the remote backup site d) Sending selected records from primary site to the remote backup site	L4	CO5
4C-13	_____ scheme that records only information about dirty pages and associated information and does not even require of writing dirty pages to disk. a) Fuzzy logic b) Checkpoints c) Fuzzy-checkpoint d) Logical checkpoint	L1	CO5
4C-14	An operation is part of a transaction if it is ___ related. A. Logically B. Analytically C. Reasonably D. None	L1	CO5
4C-15	How many operations of transactions are there? A. 3 B. 4 C. 5 D. 6	L1	CO5
FILL IN THE BLANKS ½ MARK QUESTIONS		BT Level	Course Outcome
4F-1	An operation is part of a transaction if it is ___ related.	L3	CO5
4F-2	To access the contents of the database, ___ user performs transactions.	L3	CO5
4F-3	X is read from a database and stored in a buffer in main memory with the ___ operation.	L2	CO5
4F-4	Writing the data from the buffer back to the database is accomplished by using the _____ operation.	L6	CO5
4F-5	_____ is used to permanently save the work.	L3	CO5
4F-6	An undo operation is called a _____.	L3	CO5

4F-7	In a database, prior to and after a transaction, properties are used to ensure ____.	L3	CO5
4F-8	____ states that all operations of a transaction must occur simultaneously; otherwise, the transaction will be aborted.	L2	CO5
4F-9	Serializability of current transaction is ensured by_____	L3	CO5
4F-10	Rollback of a transaction is_____	L3	CO5
4F-11	_____ ensure that system will never entered in deadlock	L4	CO5
4F-12	Transactions that are ____ do not expose all changes.	L3	CO5
4F-13	All changes made in a transaction are ____ once it commits.	L3	CO5
4F-14	Transactions allow the database to be transformed from ____.	L2	CO5
4F-15	A database's consistent state is measured by the ____ property.	L3	CO5
	MATCHTHEFOLLOWING 1MARK QUESTIONS	BT Level	Course Outcome
4M-1	(1) COMMITED STATE (A) When a transaction aborts (2) ACTIVE STATE (B) when a transaction begins (3) FAILED STATE (C) when a transaction cannot be started (4) TERMINATED STATE (D) When transaction is executed	L1	CO5
4M-2	(1) Atomicity (A) Data should be correct even after System failures (2) Integrity (B) Correctness of data (3) Consistency (C) Transaction should be either happen completely or not at all (4) Durability (D) Multiple transactions occur without any interference	L1	CO5
4M-3	(1) Growing Phrase (A) Transaction obtains lock but cannot release lock (2) Shrinking Phrase (B) Ensures no violation of serializability (3) Validation Phrase (C) Transaction releases locks but no new locks	L1	CO5
4M-4	(1) Serial Schedule (A) Concurrent execution (2) Non-Serial Schedule (B) Transactions execute one after the other (3) Serializable Schedule (C) Transactions execute randomly	L1	CO5

PART B
5 MARKSQUESTIONS

4D-1	Illustrate Concurrent execution of transaction with examples?	L1	CO5
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4D-2	Describe the shadow paging recovery technique. Under what circumstances does it not require a log ?	L2	CO5
4D-3	Make clear about serializability? Discuss about conflict serializability?	L2	CO5
4D-4	Explain ACID properties and Illustrate them through examples?	L2	CO5
4D-5	What is the functionality of lock manager and transaction manager?	L3	CO5
4D-6	What information does the dirty page table and transaction table contain? Give a short notes on recovery from deadlock.	L3	CO5
4D-7	Write about 2-phase locking and lock granularity?	L2	CO5
4D-8	Discuss about time stamp method protocol?	L2	CO5
4D-9	What is a log in the content of DBMS? How does check pointing eliminate some of the problems associated with log based recovery?	L2	CO5
4D-10	How the terms fuzzy check pointing and recovery algorithm are used in advanced recovery techniques?	L2	CO5
4D-11	Discuss the failures that can occur with loss of Non-volatile storage?	L2	CO5
4D-12	Discuss how do you recover from Concurrent transactions?	L4 L1	CO5
4D-13	Discuss in detail Multiple Granularity? Explain Buffer Management?	L4	CO5
4D-14	Explain different types of Advanced Recovery Techniques?	L1	CO5
4D-15	Write in detail about Remote Backup systems?	L4, L1	CO5

UNIT – V			
OBJECTIVE TYPE QUESTIONS ½ MARK QUESTIONS		BT Level	Course Outcome
5C-1	The log is a sequence of _____ recording all the update activities in the database. a) Log records b) Records c) Entries d) Redo	L1	CO6
5C-2	The _____ scheme uses a page table containing pointers to all pages; the page table itself and all updated pages are copied to a new location. a) Shadow copy b) Shadow Paging c) Update log records d) AI	L1	CO6
5C-3	The storage structure which do not survive system crashes are _____ a) Volatile storage b) Non-volatile storage c) Stable storage d) Dynamic storage	L1	CO6
5C-4	The unit of storage that can store one are more records in a hash file organization are a) Buckets b) Disk pages c) Blocks d) Nodes	L3	CO6
5C-5	Which of the following is the oldest database model? a) Relational b) Hierarchical c) Physical d) Network	L1	CO6

5C-6	A hash function must meet _____ criteria. a) Two b) Three c) Four d) None of the mentioned	L1	CO6
5C-7	The property (or set of properties) that uniquely defines each row in a table is called the: a) Identifier b) Index c) Primary key d) Symmetric key	L1	CO6
5C-8	The database design that consists of multiple tables that are linked together through matching data stored in each table is called a) Hierarchical database b) Network database c) Object oriented database d) Relational database	L1	CO6
5C-9	The primary storage is also referred as - A. Volatile Storage B. Non-volatile Storage C. Seamless Storage D. None of the above	L1	CO6
5C-10	Memory types that use _____ storage do not permanently store data. A. Primary B. Secondary C. Tertiary D. None	L3	CO6
5C-11	Which of the following is the type of data storage? A. Primary B. Secondary C. Tertiary D. All of the above	L1	CO6
5C-12	We can access records by using the _____ key. A. Primary B. Foreign C. Alternate D. Composite	L1	CO6
5C-13	Based on the type of file organization for a given set of records, we can determine the _____ of access. A. Type B. Frequency C. Both A and B	L1	CO6

	D. None of the above		
5C-14	How many types of file organizations are there? A. 5 B. 6 C. 7 D. 8	L1	CO6
5C-15	A hashing function is used to generate the ___ of the data blocks in this technique. A. Data B. Addresses C. Numbers D. Records	L3	CO6

	FILL IN THE BLANKS ½ MARK QUESTIONS	BT Level	Course Outcome
5F-1	___ are contained in the File.	L2	CO6
5F-2	The implementation of files of fixed length records is simpler than that of files of ___ length records.	L1	CO6
5F-3	___ cannot be created by inserting, updating, or deleting records.	L1	CO6
5F-4	A ___ is a memory location where these records are stored.	L2	CO6
5F-5	Any value in the column can be used by a ___ function to generate the address.	L2	CO6
5F-6	To generate the address of a data block, the hash function most often uses the ___ key.	L1	CO6
5F-7	When a database structure has a huge number of index values, it is very ___ to search all of them for the desired information.	L1	CO6
5F-8	Various storage devices store ___ in the form of data.	L2	CO6
5F-9	Data stored in the primary storage can be accessed ___.	L2	CO6
5F-10	A power ___ of the system also results in the loss of data.	L1	CO6
5F-11	A B-tree of order m has maximum of children	L3	CO6

5F-12	Efficiency of finding the next record in B+ tree is ____	L6	CO6
5F-13	There is/are ____ levels of indexing in the B+ tree.	L4	CO6
5F-14	The leaf nodes of the B+ tree represent actual data ____.	L1	CO6
5F-15	A ____ is used to link the leaf nodes in the B+ tree.	L1	CO6
MATCH THE FOLLOWING 1 MARK QUESTIONS		BT Level	Course Outcome
5C-1	(1) RAM (A) Static Random Access Memory (2) DRAM (B) Random Access Memory (3) SRAM (C) Dynamic Access Memory	1	CO6
5C-2	(1) Sequential File Organization (A) Files are stored in tree like structure (2) Heap File Organization (B) Files are stored in a sequential order (3) Hash File Organization (C) Data in a file are stored in Blocks (4) B+ File Organization (D) Uses Hash functions in finding a file	2	CO6
5C-3	(1) Ordered Index (A) Index created on a Primary key (2) Primary Index (B) Contains Search key value in data files (3) Clustered Index (C) Index on sorted columns (4) Dense Index (D) Index defined on ordered data files	1	CO6
5C-4	(1) RAID 0 (A) Record error correction done (2) RAID 1 (B) Strips data on to multiple disks (3) RAID 2 (C) Uses mirroring techniques in sending data to RAID controller (4) RAID 3 (D) Data is broken down into blocks	1	CO6
5C-5	(1) Static Hashing (A) New data bucket allocated for same hash result (2) Dynamic Hashing (B) Resultant data bucket address is always same (3) Close Hashing (C) Data bucket grows or Shrinks	2	CO6

PART B			
5 MARKS QUESTIONS			
5C-1	Discuss the Index Data structure?	L2	CO6
5C-2	Discuss the Intuitions for tree Indexes?	L1	CO6
5C-3	Discuss the difference between index sequential and hashed file organizations. Compare their storage and access efficiencies. List the applications where each of the file organization is suitable?	L2	CO6
5C-4	Compare the hash based Indexing and Tree base Indexing?	L2	CO6
5C-5	What is over flow page? With a neat diagram, briefly describe ISAM Index structure?	L2	CO6
5C-6	Give a brief note on File organization and Indexing?	L6	CO6

5C-7	Enlighten about primary and secondary Indexes?	L4	CO6
5C-8	Explain B+ trees? Discuss about this Dynamic Index Structure?	L2	CO6
5C-9	Make clear Multi-key file organization in detail?	L5	CO6
5C-10	Write about fixed-length representation in detail?	L4	CO6
5C-11	Which of the three basic file organizations would you choose for a file where the most frequent operations are as follows, i. Search for records based on a range of field values. ii. Perform insert and scans where the order of records does not matter. iii. Search for a record based on a particular field value.	L2	CO6
5C-12	Explain in detail about ISAM?	L2	CO6
5C-13	Compare and Contrast Extendible Hashing with Linear Hashing?	L4	CO6
5C-14	Compare I/O costs for all File Organizations?	L4	CO6
5C-15	Illustrate insertion and deletion of an element in B+ trees with example?	L6	CO6

Section – B

S.NO	Bloom Taxonomy Level	No. Of. Questions	%	Name & Signature of Paper Setter
1	Fundamental Knowledge from level I & II	5	50	
2	Knowledge on application & Analysis from level III & IV	2	20	
3	Critical thinking and ability to design from level V & VI	3	30	

COURSE OUTCOMES

COURSE NAME : JAVA PROGRAMMING (R22CSI2215)

At the end of the course student will be able to:

Course Outcomes	Statements
C225 .1	Able to solve real world problems using OOPS techniques. (Understanding)
C225 .2	Able to solve problems using java collection framework and I/O classes. (Apply)
C225 .3	Able to develop multithreaded applications with synchronization. (Understanding)
C225 .4	Able to design GUI based applications. (Create)
C225 .5	Study and identify various exception handling methods related to the development of real world applications and learning Reliability concepts. (Apply)
C225 .6	Understand the design aspects of OOPs principles and related development. (Understanding)

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3
C225 .1	2	1	1	3	3	1	-	-	-	2	1	-	2	-
C225 .2	3	-	1	1	3	1	-	-	-	1	-	-	1	-
C225 .3	1	1	1	3	3	-	-	-	-	1	-	1	1	-
C225 .4	1	1	-	3	3	-	-	-	-	-	-	-	-	-
C225 .5	1	-	2	1	3	-	-	-	-	1	-	1	1	1
C225 .6	1	-	1	-	3	-	-	-	-	-	-	-	1	-
C225	1.5	1	1.2	2.2	3	1	-	-	-	1.25	1	1	1.2	1



Sri Indu College of Engineering and Technology
 (An Autonomous Institution under UGC)
 Sheriguda (V), Ibrahimpatnam (M), Ranga Reddy (Dist) – 501 510

Department of Information Technology

ROOM NO: 303
 Class: II IT (II SEM)

Time - Table

w.e.f: 20/1/2025

Time	9:40 – 10:40	10:40 – 11:40	11:40 – 12:40	12:40 To 1:20	1:20 – 2:15	2:15 – 3:10	3:10 – 4:00
Days	1	2	3		4	5	6
Monday	JAVA	DBMS	DM	L U N C H	← JP LAB →		
Tuesday	DBMS	JAVA	COI		BEFA	OS	DM
Wednesday	BEFA	← SDC LAB →			DBMS	DM	JAVA
Thursday	OS	← RTRP →			JAVA	DBMS	BEFA
Friday	DM	BEFA	OS		← DBMS LAB →		
Saturday	← OS LAB →				OS	JAVA	COI

SUBJECT CODE	SUBJECT NAME	NAME OF THE FACULTY
R22CSE2111	Discrete Mathematics(DM)	Mrs.S.VARSHA REDDY
R22HMS1212	Business Economics & Financial Analysis(BEFA)	Mrs.N.RAMYA
R22CSE2213	Operating Systems(OS)	Dr.P.EPSIBA
R22CSE2214	Database Management Systems(DBMS)	Mrs.J.HEMALATHA
R22CSI2215	Java Programming(JP)	Mrs.J.SASIREKHA
R22CSE2226	Operating Systems Lab(OS LAB)	Mr.A.VENU,Mrs.Y.HARATHI
R22CSE2227	Database Management Systems Lab(DBMS LAB)	Mrs.J.HEMALATHA, Miss.T.GLORY
R22CSI2228	Java Programming Lab(JP LAB)	Mrs.J.SASIREKHA, Mrs.C.MADHUSUDANAMMA
R22INF2269	Real-time Research Project/ Societal Related Project(RTRP)	Mrs.K.PRIYANKA
R22MAC2110	Constitution of India(COI)	Dr.B.SANJIAH
R22CSE2221	Skill Development Course (Node JS/ React JS/Django)(SDC LAB)	Mrs.J.S.RADHIKA, Mrs.M.SUDHA RANI
COUN	COUNSELLING(COUN)	Mrs.C.MADHUSUDANAMMA, Mrs.S.VARSHA REDDY Mrs.K.PRIYANKA

CLASS CO-ORDINATOR
 MRS.J.HEMALATHA

HOD/IT



Sri Indu College of Engineering and Technology

(An Autonomous Institution under UGC)

Sheriguda(V), Ibrahimpatnam(M), Ranga Reddy(Dist)-501510

Department of Information Technology

FACULTY INDIVIDUAL TIME TABLE

Name of the Faculty : Mrs. J. Sasirekha

Room No: LH-304(IT),MB-LAB-V

Designation : Assistant Professor

AY:2024-2025 Year/ Semester:II/II

Time	9:40– 10:40	10:40– 11:40	11:40– 12:40	12:40 To1 :20	1:20–2:15	2:15– 3:10	3:10– 4:00
Days	1	2	3		4	5	6
Monday	II IT			L U N C H	II IT		
Tuesday		II IT					
Wednesday							II IT
Thursday						II IT	
Friday							
Saturday							II IT

S.NO.	SUBJECT CODE	SUBJECT	CLASS	NO OF HOURS IN A WEEK	ADDITIONAL WORKLOAD
1	R22CSI2215	JAVA PROGRAMMING (JP)	II IT	5	NBA-Criteria VII Member
2	R22CSI2228	JAVA PROGRAMMING LAB (JP LAB)	II IT	3	
3	Total Hours In a Week			8	

Faculty Signature

Head of the Department

Academic Calendar 2024-2025



SRI INDU COLLEGE OF ENGINEERING & TECHNOLOGY
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 Sheriguda (V), Ibrahimpatnam, R.R. Dist, Hyderabad - 501 510

D4

BR-22

Lr.No.SICET/AUTO/DAE/II B.Tech Academic Calendar/88/2024

B.TECH II-YEAR I-SEM & II-SEM ACADEMIC CALENDAR **(FOR ACADEMIC YEAR : 2024-25)**

Academic Calendar for B.Tech – IInd Year Students (2023 - 24 Batch), BR-22 Regulation.

I – Semester

S.No.	EVENT	PERIOD	DURATION
1.	Commencement of class work.	31.07.2024 (Wednesday)	
2.	1 st Spell of Instructions for covering First Two and a half Units.	31.07.2024 – 28.09.2024	8 Weeks 4 Days
3.	I Mid Term Examinations.	30.09.2024 – 05.10.2024	5 Days
4.	Submission of I Mid Term Examination Marks.	09.10.2024	
5.	2 nd Spell of Instructions for Remaining Two and a half Units.	14.10.2024 – 14.12.2024	9 Weeks
6.	II Mid Term Examinations.	16.12.2024 – 18.12.2024	3 Days
7.	Preparation Holidays and Practical Examinations	19.12.2024 – 28.12.2024	1 Week 3 Days
8.	Submission of II Mid Term Examination Marks.	27.12.2024	
9.	I Semester End Examinations.	31.12.2024 – 18.01.2025	3 Weeks
Commencement of Class-Work for II B.Tech - II Semester 20.01.2025 (Monday)			

Note: No of Working/instructional days : 91

II – Semester

S.No.	EVENT	PERIOD	DURATION
1.	Commencement of class work.	20.01.2025 (Monday)	
2.	1 st Spell of Instructions for covering First Two and a half Units.	20.01.2025 – 22.03.2025	9 Weeks
3.	I Mid Term Examinations.	24.03.2025 – 26.03.2025	3 Days
4.	Submission of I Mid Term Examination Marks.	02.04.2025	
5.	2 nd Spell of Instructions for Remaining Two and a half Units.	27.03.2025 – 10.05.2025	6 Weeks 3 Days
6.	Summer Vacation	12.05.2025 – 24.05.2025	2 Weeks
7.	Continuation of 2 nd Spell of Instructions for Remaining Two and a half Units	26.05.2025 – 11.06.2025	2 Weeks 3 Days
8.	II Mid Term Examinations.	12.06.2025 – 14.06.2025	3 Days
9.	Preparation Holidays and Practical Examinations	16.06.2025 – 21.06.2025	1 Week
10.	Submission of II Mid Term Examination Marks.	19.06.2025	
11.	II Semester End Examinations	24.06.2025 – 07.07.2025	2 Weeks
12.	Commencement of Class-Work for III B.Tech - I Semester	09.07.2025(Wednesday)	

Note: No of Working/instructional days : 98

[Signature]
ACE

Controller of Examination
 Sri Indu College of Engineering & Technology
 (An Autonomous Institution Under UGC)
 Sheriguda (V), Ibrahimpatnam, R.R. Dist-501510.

[Signature]
DIRECTOR

Sri Indu College of Engineering & Technology
 (An Autonomous Institution Under UGC)
 Sheriguda (V), Ibrahimpatnam, R.R. Dist-501510.

[Signature]
PRINCIPAL

Sri Indu College of Engineering & Technology
 (An Autonomous Institution Under UGC)
 Sheriguda (V), Ibrahimpatnam, R.R. Dist-501510.

Sign: *[Signature]*

Dr. M.V.S.S. Giridhar
 Prof. of CEA; JNTUH Nominee

Sign: *[Signature]*

Dr. T. Venu Gopal
 Prof. of CSE; JNTUH Nominee

Sign: *[Signature]*

Dr. D. Ramesh
 Prof. of CSE; JNTUH Nominee

(Copy to DAP&E and Copy to all the Dept. Heads)

SRI INDU COLLEGE OF ENGINEERING & TECHNOLOGY

(An Autonomous Institution under UGC, New Delhi)

B.Tech. - II Year – II Semester

L T P C

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(R22CSI2215) JAVA PROGRAMMING

Course Objectives:

- To introduce object-oriented programming principles and apply them in solving problems.
- To introduce the implementation of packages and interfaces.
- To introduce the concepts of exception handling and multithreading.
- To introduce the design of Graphical User Interface using swing controls.

Course Outcomes:

- Able to solve real world problems using OOP techniques.
- Able to solve problems using java collection framework and I/O classes.
- Able to develop multithreaded applications with synchronization.
- Able to design GUI based applications.

UNIT - I

Foundations of Java: History of Java, Java Features, Variables, Data Types, Operators, Expressions, Control Statements. Elements of Java - Class, Object, Methods, Constructors and Access Modifiers, Generics, Inner classes, String class and Annotations.

OOP Principles: Encapsulation – concept, setter and getter method usage, this keyword. Inheritance - concept, Inheritance Types, super keyword. Polymorphism – concept, Method Overriding usage and Type Casting. Abstraction – concept, abstract keyword and Interface.

UNIT – II

Exception Handling: Exception and Error, Exception Types, Exception Handler, Exception Handling Clauses – try, catch, finally, throws and the throw statement, Built-in-Exceptions and Custom Exceptions.

Files and I/O Streams: The file class, Streams, The Byte Streams, Filtered Byte Streams, The Random Access File class.

UNIT – III

Packages- Defining a Package, CLASSPATH, Access Specifiers, importing packages. Few Utility Classes - String Tokenizer, BitSet, Date, Calendar, Random, Formatter, Scanner.

Collections: Collections overview, Collection Interfaces, Collections Implementation Classes, Sorting in Collections, Comparable and Comparator Interfaces.

UNIT – IV

Multithreading: Process and Thread, Differences between thread-based multitasking and process-based multitasking, Java thread life cycle, creating threads, thread priorities, synchronizing threads, inter thread communication.

Java Database Connectivity: Types of Drivers, JDBC architecture, JDBC Classes and Interfaces, Basic steps in Developing JDBC Application, Creating a New Database and Table with JDBC.

UNIT - V

GUI Programming with Swing – Introduction, limitations of AWT, MVC architecture, components, containers, Layout Manager Classes, Simple Applications using AWT and Swing.

Event Handling- The Delegation event model- Events, Event sources, Event Listeners, Event classes, Handling mouse and keyboard events, Adapter classes.

BR22 – B.TECH. – INFORMATION TECHNOLOGY

TEXT BOOKS:

1. Java The complete reference, 9th edition, Herbert Schildt, McGraw Hill Education (India) Pvt.Ltd.
2. Understanding Object-Oriented Programming with Java, updated edition, T. Budd, Pearson Education.

REFERENCE BOOKS:

1. An Introduction to programming and OO design using Java, J. Nino and F.A. Hosch, John Wiley & sons
2. Introduction to Java programming, Y. Daniel Liang, Pearson Education.
3. Object Oriented Programming through Java, P. Radha Krishna, University Press.
4. Programming in Java, S. Malhotra, S. Chudhary, 2nd edition, Oxford Univ. Press.
5. Java Programming and Object-oriented Application Development, R. A. Johnson, Cengage Learning.

LESSON PLAN



SRI INDU COLLEGE OF ENGG & TECH

LESSON PLAN

(Regulation : R22)

Department of Information Technology

R22

Sub.Code & Title

R22CSI2215 & Java Programming

Academic Year : 2024 - 2025

Year/Sem.

II - II

Faculty Name & Designation

Mrs. J SASIREKHA, Assistant Professor

Unit/ Item No.	Topic(s)	Book Reference	Page(s)		Teaching Methodology	Proposed No.of Periods	Actual Date Of Handled	CO/ RBT
			From	To				
UNIT - I								
I	Foundations of Java					15		
1.1	History of Java, Java Features	T1	3	15	Black board	2		CO1
1.2	Variables, Data Types	-	Notes		Black board	1		
1.3	Operators, Expressions, Control Statements.	T1	28	108	PPT	3		
1.4	Elements of Java - Class, Object, Methods	T1	109	121	Black board	1		
1.5	Constructors and Access Modifiers	T1	121	144	PPT	1		
1.6	Generics, Inner classes, String class and Annotations.	T1	149	154	Black board	1		
1.7	OOP Principles : Encapsulation – concept, setter and getter method usage, this keyword.	-	Notes		Black board	2		
1.8	Inheritance - concept, Inheritance Types, super keyword	T1	161	174	Blackboard	2		
1.9	Polymorphism – concept, Method Overriding usage and Type Casting	T1	175	181	Black board	1		
1.10	Abstraction – concept, abstract keyword and Interface.	T1	181	185	PPT	1		
	Review	Signature of the HOD / Coordinator						
UNIT - II								
II	Exception Handling					10		
2.1	Exception and Error, Exception Types, Exception Handler	T1	213	219	Blackboard	2		CO2
2.2	Exception Handling Clauses – try, catch, finally, throws and the throw statement	T1	220	225	Black board	2		
2.3	Built-in-Exceptions and Custom Exceptions	T1	226	232	PPT	2		
2.4	File and I/O Streams : The file class, Streams	T1	301	302	Black board	1		
2.5	The Byte Streams, Filtered Byte Streams	T1	650	669	PPT	2		
2.6	The Random Access File class.	T1	669	670	PPT	1		
	Review	Signature of the HOD / Coordinator						

UNIT – III**III Packages****09**

3.1	Defining a Package, CLASSPATH	T1	187	190	Black board	1		CO3
3.2	Access Specifiers, importing packages	T1	191	196	PPT	2		
3.3	Few Utility Classes - String Tokenizer, BitSet,	-	Notes		PPT	1		
3.4	Date, Calendar, Random, Formatter, Scanner	-	Notes		PPT	2		
3.5	Collections : Collections overview, Collection Interfaces, Collections Implementation Classes	T1	532	542	Black board	2		CO4
3.6	Sorting in Collections, Comparable and Comparator Interfaces	-	Notes		PPT	1		

Review**Signature of the HOD / Coordinator****UNIT – IV****IV Multi Threading****10**

4.1	Process and Thread, Differences between thread-based multitasking and process-based multitasking	T1	Notes		Black board	02		CO5
4.2	Java thread life cycle, creating threads, thread priorities	T1	233	246	Black board	02		
4.3	Synchronizing threads, inter thread communication	T1	247	255	Black board	01		
4.4	Java Database Connectivity : Types of Drivers, JDBC architecture, JDBC Classes and Interfaces	T1	Notes		Blackboard	02		
4.5	Basic steps in Developing JDBC Application	T1	Notes		PPT	01		
4.6	Creating a New Database and Table with JDBC.	T1	Notes		Blackboard	02		

Review**Signature of the HOD / Coordinator****UNIT – V****V GUI Programming with Swing****13**

5.1	Introduction, limitations of AWT	T1	Notes		Blackboard	2		CO6
5.2	MVC architecture, components, containers	T1	833	855	PPT	1		
5.3	Layout Manager Classes	T1	855	870	Blackboard	1		
5.4	Simple Applications using AWT and Swing	T1	Notes		Blackboard	2		
5.5	Event Handling : The Delegation event model	T1	770	770	Blackboard	1		
5.6	Events, Event sources	T1	770	771	PPT	1		
5.7	Event Listeners, Event classes	T1	771	777	Seminar	2		
5.8	Handling mouse and keyboard events	T1	777	791	Seminar	2		
5.9	Adapter classes	T1	791	793	PPT	1		

Review**Signature of the HOD / Coordinator**

LIST OF TEXT BOOKS AND REFERENCES

Text Books:

1. Java The complete reference, 9 th edition, Herbert Schildt, McGraw Hill Education (India) Pvt.Ltd.
2. Understanding Object-Oriented Programming with Java, updated edition, T. Budd, Pearson Education.

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4. Programming in Java, S. Malhotra, S. Chudhary, 2nd edition, Oxford Univ. Press.
5. Java Programming and Object-oriented Application Development, R. A. Johnson, Cengage Learning

Web links

- w-1. <https://www.youtube.com/watch?v=Zs342ePFvRI>
- w-2. <https://archive.nptel.ac.in/courses/106/105/106105191/>
- w-3. <https://www.youtube.com/watch?v=fSedytelNIM>
- w-4. <https://www.youtube.com/watch?v=eEujVn-ZTLE>
- w-5. https://www.youtube.com/watch?v=_nmm0nZqIIY

CONTENT BEYOND THE SYLLABUS

S.No	Topics	Proposed Actions	Date	Resource Person/Mode	POs	PSOs
1	Swing Components	To get knowledge on Swing Controls		Dr. Adeline	3	1
2	Real Time Applications using Java Language	To get knowledge on Real Time Projects		Students Seminar	6	3

	SRI INDU COLLEGE OF ENGINEERING AND TECHNOLOGY DEPARTMENT OF INFORMATION TECHNOLOGY	
	Sub. Code & Name	R22CSI2215–JAVA PROGRAMMING
Year/Sem.: II/II	Date of Announcement	Submission Date
Assn. No: I	08.03.2025	13.03.2025

ASSIGNMENT QUESTIONS

Question no.	Question	Marks	RBT Level	COs
Batch 1 (Roll No: 23D41A1201 to 1205)				
1	Explain about Features of Java.	5	K2	C225.1
2	Explain about OOPs concepts along with examples.	5	K2	C225.1
3	What is the difference between exception and error. Give examples.	5	K4	C225.2
4	What are different types of exceptions? Explain it.	5	K4	C225.2
5	What is a package and java API package?	5	K3	C225.3
Batch 2 (Roll No: 23D41A1206 to 1210)				
1	Explain about Relational and Assignment Operators in java.	5	K2	C225.1
2	Discuss in detail about Control statements.	5	K2	C225.1
3	Explain hierarchy of exception class?	5	K2	C225.2
4	Write a program for implementing try with multi-catch clauses?	5	K3	C225.2
5	Explain the access specifiers and CLASS PATH?	5	K2	C225.3
Batch 3 (Roll No: Roll No: 23D41A1211 to 1215)				
1	What is Encapsulation , Discuss how it works with the help of Getter and Setter methods.	5	K3	C225.1
2	Write short notes on “new”, “this” ,“super” ,”static”, ”final” keywords in Java?	5	K3	C225.1
3	Discuss about try, catch, throw, throws and finally keywords.	5	K2	C225.2
4	How an exception can be thrown explicitly? Demonstrate with a program.	5	K3	C225.2
5	List and explain classes available in java.util package	5	K1	C225.3
Batch 4 (Roll No: 23D41A1216 to 1220)				
1	Explain about Constructors in Java and types of constructors with an example program.	5	K2	C225.1
2	Define Polymorphism and explain about Method overloading and Method Overriding	5	K1	C225.1
3	How to create user defined exception? Explain with an example program.	5	K2	C225.2

4	Explain about File Class in java with example.	5	K2	C225.2
5	List and explain the working of different access specifiers with packages.	5	K1	C225.3
Batch 5 (Roll No: 23D41A1221 to 1225)				
1	Define Array and types of arrays in Java?	5	K1	C225.1
2	Define inheritance, Develop a java program on multilevel inheritance.	5	K1	C225.1
3	Explain about Streams in java with example.	5	K2	C225.2
4	Write the simple java program that reads data from one file and writes data to another file.	5	K3	C225.2
5	What is Package? Explain about it with types and examples.	5	K2	C225.3
Batch 6 (Roll No: 23D41A1226 to 1230)				
1	Write different types of operators in java?	5	K4	C225.1
2	What is java token and different data types?	5	K4	C225.1
3	Explain the concept of Exception handling in Java. What are the main benefits of using exception handling in Java programming?	5	K2	C225.2
4	Explain the purpose of the try, catch, and finally blocks in Java's exception handling. Provide a code example to illustrate their usage.	5	K2	C225.2
5	Explain about few utility classes of java packages.	5	K2	C225.3
Batch 7 (Roll No: 23D41A1231 to 1235)				
1	What are different types of variables in java?	5	K4	C225.1
2	What are different control structures or statements in Java?	5	K4	C225.1
3	Discuss the Java exception hierarchy. What is the significance of the Throwable class, and how does it relate to Error and Exception?	5	K2	C225.2
4	How can you create your own custom exception subclass in Java? Provide an example of when and why you might create a custom exception.	5	K3	C225.2
5	Define Package. How to create and use a package in java?	5	K1	C225.3
Batch 8 (Roll No: 23D41A1236 to 1240)				
1	Write syntax for single and multi dimensional array?	5	K3	C225.1
2	Write the usage of Scanner class and BufferedReader Class using syntax and example?	5	K3	C225.1
3	Explain the purpose of the try and catch, Provide a code example to illustrate their usage.	5	K2	C225.2

4	Explain in detail about Random access file.	5	K2	C225.2
5	Explain about Importing packages with example.	5	K2	C225.3
Batch 9 (Roll No: 23D41A1241 to 1245)				
1	Write difference between class and object?	5	K4	C225.1
2	What is inheritance and types of inheritance?	5	K3	C225.1
3	Explain about stream and Discuss different operations on streams.	5	K2	C225.2
4	Discuss in detail about filtered byte Streams.	5	K2	C225.2
5	Explain about the following utility classes a. BitSet b. Date c. Calendar.	5	K2	C225.3
Batch 10 (Roll No: 23D41A1246 to 1250)				
1	Differentiate method overloading and constructor overloading?	5	K4	C225.1
2	What is data abstraction and give example of an abstract class?	5	K3	C225.1
3	Define file class and explain in detail about fields and methods of file.	5	K1	C225.2
4	Define Byte stream class and explain about input and output stream classes.	5	K1	C225.2
5	Explain about the following utility classes a. Random b. Formatter c. Scanner.	5	K2	C225.3
Batch 11 (Roll No: 23D41A1251 to 1256)				
1	Explain about Annotation and its types with example	5	K2	C225.1
2	What is polymorphism and differentiate static and dynamic polymorphism?	5	K4	C225.1
3	Explain Filtered Byte stream classes with example?	5	K2	C225.2
4	Define Package and explain how to access package from another package.	5	K1	C225.3
5	Explain about CLASSPATH, and how to set CLASSPATH.	5	K2	C225.3
Batch 12 (Roll No: 23D41A1257 to 1261)				
1	Explain about Generic Class and methods with example.	5	K2	C225.1
2	Explain different string classes in java? Give one example for string classes.	5	K2	C225.1
3	Differentiate Built-in Exception with Custom Exception	5	K4	C225.2
4	Discuss in details about access specifiers.	5	K3	C225.3
5	Explain about utility classes and what are advantages of utility classes.	5	K2	C225.3

Batch 13 (Roll No: 23D41A1262 – 64, LE-01 - 03)

1	Explain about Inner Classes and its types with example.	5	K2	C225.1
2	What is the difference between Checked and Unchecked Exceptions in Java?	5	K4	C225.2
3	Explain Byte stream classes with example?	5	K2	C225.2
4	Explain about String Tokenizers, methods if string tokenizers in detail.	5	K2	C225.3
5	Write a program to illustrate access specifiers.	5	K3	C225.3



**SRI INDU COLLEGE OF ENGINEERING AND TECHNOLOGY
DEPARTMENT OF INFORMATION TECHNOLOGY**

Sub. Code & Name

R22CSI2215–JAVA PROGRAMMING

Year/Sem.: II/II

Date of Announcement

Submission Date

Assn. No: II

28.05.2025

06.06.2025

ASSIGNMENT QUESTIONS

Question no.	Question	Marks	RBT Level	COs
Batch 1 (Roll No: 23D41A1201 to 1205)				
1	Explain about utility classes and what are advantages of utility classes.	5	K2	C225.4
2	Define and discuss in detail about process in thread?	5	K3	C225.5
3	Explain about types of driver.	5	K2	C225.5
4	What are the limitations of AWT.	5	K1	C225.6
5	Explain Applet life cycle with neat diagram.	5	K2	C225.6
Batch 2 (Roll No: 23D41A1206 to 1210)				
1	Explain about String Tokenizers, methods if string tokenizers in detail.	5	K2	C225.4
2	Differentiate thread based multitasking and process based mutli tasking?	5	K4	C225.5
3	Explain about JDBC .	5	K2	C225.5
4	Explain about MVC architecture? Components?	5	K2	C225.6
5	Explain about any three Swing components.	5	K2	C225.6
Batch 3 (Roll No: 23D41A1211 to 1215)				
1	Develop a program to illustrate access specifiers.	5	K6	C225.4
2	Explain about java thread life cycle.	5	K2	C225.5
3	Explain about JDBC Architecture with neat diagram.	5	K2	C225.5
4	What are the Applications using AWT and Swing.	5	K1	C225.6
5	Write a program for Calculator using Swings.	5	K6	C225.6
Batch 4 (Roll No: 23D41A1216 to 1220)				
1	What is collection? Explain collection framework in detail.	5	K2	C225.4
2	Discuss in detail about thread priority with example.	5	K2	C225.5
3	List the JDBC Classes and Interfaces.	5	K1	C225.5
4	List the JDBC Event Listeners and the Event Classes.	5	K1	C225.6
5	Write a java program for handling Mouse Events.	5	K6	C225.6

Batch 5 (Roll No: 23D41A1221 to 1225)				
1	Discuss briefly about methods involved in Collection interface.	5	K1	C225.4
2	What is thread ? Draw thread life cycle diagram in Java	5	K1	C225.5
3	Discuss basic steps involved in developing JBC application.	5	K2	C225.5
4	Design a simple application using GUI Swing.	5	K6	C225.6
5	Write a java program for handling Key Events	5	K6	C225.6
Batch 6 (Roll No: 23D41A1226 to 1230)				
1	Define and explain about Sorting in Collections.	5	K1	C225.4
2	With proper syntax and example explain following thread methods : (1) wait() (2) sleep() (3) resume() (4) notify()	5	K2	C225.5
3	How to create a new database and table in java?	5	K2	C225.5
4	Define AWT and its applications.	5	K1	C225.6
5	Differentiate AWT with Swing.	5	K4	C225.6
Batch 7 (Roll No: 23D41A1231 to 1235)				
1	Differentiate Comparable and Comparator interface with examples.	5	K4	C225.4
2	List the two methods to create threads in java with example.	5	K1	C225.5
3	Write a program to create two threads, so one thread will print even numbers between 1 to 10 whereas other will print odd numbers between 11 to 20.	5	K6	C225.5
4	List the Layout Manager Classes in GUI programming with swing.	5	K6	C225.6
5	Explain different types of Layouts with example program.	5	K2	C225.6
Batch 8 (Roll No: 23D41A1236 to 1240)				
1	What is the Java Collection Framework? List the main interfaces of the Collection Framework?	5	K1	C225.4
2	Explain about Thread Synchronization with example.	5	K2	C225.5
3	Write a Java program using JDBC to extract name of those students who live in RR district, assuming that the student table has four attributes (ID, name, district, and age).	5	K6	C225.5
4	Explain the Delegation event model in Event Handling.	5	K2	C225.6
5	Explain any four applet tag with example.	5	K2	C225.6
Batch 9 (Roll No: 23D41A1241 to 1245)				
1	Explain the difference between ArrayList and LinkedList with example.	5	K2	C225.4
2	Explain about Inter Thread Communication with suitable example.	5	K2	C225.5

3	Discuss How do you execute SQL statements using JDBC? Explain with example.	5	K3	C225.5
4	Explain about the Adapter class with example.	5	K2	C225.6
5	Write syntax and example of (i) Draw poly (ii) Draw Rect (iii) Filloval (iv) Draw Arc ()	5	K1	C225.6
Batch 10 (Roll No: 23D41A1246 to 1250)				
1	What is the role of the Collections class?	5	K1	C225.4
2	What do you mean by Multithreading? Develop a simple program to illustrate the use of multithreading.	5	K6	C225.5
3	Differentiate JDBC Two-Tier Architecture with Three-Tier Architecture.	5	K4	C225.5
4	Explain about Delegation Event Model?	5	K2	C225.6
5	Explain Java Swing class hierarchy	5	K2	C225.6
Batch 11 (Roll No: 23D41A1251 to 1256)				
1	Explain about BitSet and Date Collection classes with example.	5	K2	C225.4
2	Explain thread states with neat diagram	5	K2	C225.5
3	Write a program to insert data in to the database using JDBC	5	K6	C225.5
4	Explain how to pass parameters to an applet with program	5	K2	C225.6
5	Explain Swing components like, JComboBox, JButton, etc.	5	K2	C225.6
Batch 12 (Roll No: 23D41A1257 to 1261)				
1	List the methods used in Random and Formatter Collection classes with examples.	5	K1	C225.4
2	Explain about java.lang.thread package.	5	K2	C225.5
3	Write a program to delete data from the database using JDBC	5	K6	C225.5
4	Explain Swing components i) JButton ii) JLabel iii) Jtextfield iv) JTextArea	5	K2	C225.6
5	Explain Graphics class with suitable example.	5	K2	C225.6
Batch 13 (Roll No: 23D41A1262 – 64, LE-01 - 03)				
1	Explain about Scanner class and its methods with example.	5	K2	C225.4
2	Describe Java's thread model.	5	K4	C225.5
3	Write a program to update data in the database using JDBC?	5	K1	C225.5
4	Difference between Applets and Applications	5	K4	C225.6
5	Write a java program that computes factorial of a number when you enter that number in textfield.	5	K6	C225.6



SRI INDU COLLEGE OF ENGG & TECH
QUESTION BANK
 (Regulation : R22)
DEPARTMENT OF INFORMATION TECHNOLOGY

(Regulation :R22)
 Prepared on
 :04/02/2025
 Rev1: 04/02/2025
 Page: 1 of 17

Sub.Code &Title	(R22CSI2215) JAVA PROGRAMMING		
Academic Year: 2024-2025	Year/Sem: II YEAR	II/I SEM: II SEM	
Faculty Name & Designation	J SASIREKHA, ASSISTANT PROFESSOR		

QUESTION BANK WITH BLOOMS TAXONOMY LEVEL (BTL)

(1.Remembering 2.Understanding 3. Applying 4.Analyzing 5.Evaluating 6.Creating)

UNIT-I: Foundations of java AND OOP Principles

	Multiple Choice Questions	BT Level	Course Outcome
1C-1	Which of the following is not an OOPS concept in Java? [] a) Polymorphism b) Inheritance c) Compilation d) Encapsulation	I	CO1
1C-2	Which environment variable is used to set the java path? [] a) MAVEN Path b) Java PATH c) JAVA d) JAVA_HOME	II	CO1
1C-3	_____ is used to find and fix bugs in the Java programs. [] a)JVM b)JRE c)JDK d)JDB	II	CO1
1C-4 is not the use of “this” keyword in Java? [] a) Referring to the instance variable when a local variable has the same name b) Passing itself to the method of the same class c) Passing itself to another method d) Calling another constructor in constructor chaining	I	CO1
1C-5	What is the extension of compiled java classes? [] a) .txt b) .js c) .class d) .java	I	CO1

1C-6	Which of the following is a Super class of every class in Java? [] a) Array List b) Abstract class c) Object class d) String	I	CO1
1C-7	Which one of the following is not an access modifier? [] a) Protected b) Void c) Public d) Private	IV	CO1
1C-8	What is the numerical range of a char data type in Java? [] a) 0 to 256 b) -128 to 127 c) 0 to 65535 d) 0 to 32767	I	CO1
1C-9	What is the return type of Constructors? [] a) int b) float c) void d) none of the mentioned	III	CO1
1C-10	Which of the following is a method having same name as that of its class? [] a) finalize b) delete c) class d) constructor	I	CO1

Fill in the blanks

1F-1	In OOP, objects are instances of _____, which are templates for creating objects.	I	CO1
1F-2	The four pillars of OOP are _____, _____, _____, and _____.	III	CO1
1F-3	_____ is the ability of a class to have multiple methods with the same name but different parameters.	III	CO1
1F-4	URL stands for -----.	I	CO1
1F-5	The _____ keyword is used to create an object of a class.	III	CO1

1F-6	----- is the java compiler.	I	CO1
1F-7	_____ is the process of creating new classes based on existing classes, allowing for code reuse and extension.	I	CO1
1F-8	The ability to take more than one forms is called -----	III	CO1
1F-9	Every object has a _____ and _____.	I	CO1
1F-10	Constructor overloading is a mechanism, where _____.	III	CO1

Match the following

1M-1	Match the following. a)Java 1) is a tool for debugging java program b) Javah 2) is a tool for creating C-like header files c) Javap 3) runs java bytecode d) jdbc 4) prints java code representation	I	CO1
1M - 2	Match the following. a) Array 1) Acquiring properties from base class b) Inheritance 2) More than one form c) Polymorphism 3) Non-primitive data type d) Encapsulation 4) Wrapping up of data	II	CO1
1M - 3	Match the following. a) Public 1) Accessing the data members inside the class b) Private 2) within the same package or subclasses in different packages. c) Default 3) Accessing the data members & member functions outside the class d) Protected 4) when we don't use any keyword explicitly.	II	CO1
1M - 4	Match the following. a)1Megabyte 1) 1024 gigabyte b) 1Gigabyte 2) 1024 kilobyte c) 1Terabyte 3) 1024terabyte d) 1Petabyte 4) 1024 megabyte	II	CO1
1M - 5	Match the following. a) Class 1) Instance of an class b) Object 2) Combination of Objects. c) Abstract class 3) Java Virtual Machine d) JVM 4) Abstract keyword	III	CO1

5 - MARKS QUESTIONS

1D-1.	Explain about Features of Java.	I	CO1
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ID-2.	Explain about OOPs concepts along with examples.	III	CO1
ID-3.	Explain about Relational and Assignment Operators in java.	II	CO1
ID-4.	Discuss in detail about Control statements.	II	
ID-5.	What is Encapsulation , Discuss how it works with the help of Getter and Setter methods.	III	CO1
ID-6.	Write short notes on “new”, “this”, “super”, “static”, “final” keywords in Java?	II	CO1
ID-7	Explain about Constructors in Java and types of constructors with an example program.	IV	CO1
ID-8	Define Polymorphism and explain about Method overloading and Method Overriding	III	CO1
ID-9	Define Array and types of arrays in Java?	I	CO1
ID-10	Define inheritance, Develop a java program on multilevel inheritance.	VI	CO1

UNIT-II: Exception Handling & Files and I/O Streams

	Multiple Choice Questions	BT Level	Course Outcome
2C-1	What is the main purpose of exception handling in Java? [] a. To encourage unchecked exceptions b. To avoid writing any error-handling code c. To handle runtime errors gracefully d. To crash the program when an error occurs	III	CO2
2C-2	Which of the following is not a part of exception handling in Java? [] a. try b. catch c. throw d. static	II	CO2
2C-3	In the context of exception handling, what is a "checked exception"? [] a. An exception that is checked at compile-time b. An exception that is checked at runtime c. An exception that is never checked d. An exception that doesn't need to be caught	II	CO2
2C-4	Which keyword is used to explicitly throw an exception in Java? [] a. throws b. throw c. try d. catch	III	CO2
2C-5	Which block in Java's exception handling is used to execute code regardless of whether an exception occurs or not? [] a. try b. catch c. finally	I	CO2

	d. throw		
2C-6	What is the top-level class in the Java exception hierarchy? a. Error b. Exception c. Throwable d. Runtime Exception	[]	II CO2
2C-7	Which of these methods are used to read in from file? a. get() b. read() c. scan() d.readFileInput()	[]	III CO2
2C-8	Which of these methods is used to write() into a file? a. put() b. putFile() c. write() d. writeFile()	[]	II CO2
2C-9	Which of these class contains the methods used to write in a file? a. FileStream b. FileInputStream c. BUfferedOutputStream d. FileBufferStream	[]	I CO2
2C-10	Which of these exception is thrown in cases when the file specified for writing is not found? a. IOException b. FileNotFoundException c. FileNotFouundException d. FileInputException	[]	

Fill in the blanks			
2F-1	Exception handling is a mechanism used to handle ___ errors or exceptional situations in Java.		I CO2
2F-2	The primary benefit of exception handling is to handle _____.		I CO2
2F-3	The keyword used to explicitly throw an exception in Java is _____.		IV CO2
2F-4	The block in Java's exception handling that is used to execute code regardless of whether an exception occurs or not is the _____ block.		I CO2
2F-5	The top-level class in the Java exception hierarchy is _____.		I,II CO2

2F-6	Exception is _____.	I	CO2
2F-7	Try must be followed by either _____ or _____.	I	CO2
2F-8	Catch must be preceded by _____.	III	CO2
2F-9	The file class is known as _____,	I	CO2
2F-10	Stream is a _____.	II	CO2

Match the following

2M-1	Match the following 1) Class a) Checked and unchecked exceptions 2) Exceptions b) Compile time exceptions 3) Errors c) Exceptions and errors 4) Object d) JVM crashes and Assertion errors	II	CO2
2M -2	Match the following 1) try block a) Must be executed 2)catch block b) It contains exception thrown out of method 3)finally block c) throw an exception try to catch 4)throw block d) Can raise exceptions	III	CO2
2M -3	Match the following 1) Start () a) wait for a thread to terminate 2) Sleep() b) start thread by calling its run method 3) run() c) Determine if a thread is still running 4) join() d) Suspend a thread for a period of time	II	CO2
2M -4	Match the following 1) Class a) Collection of Objects 2) Object d) Must be executed 3)finally block c) Instance of a Class 4) Exception d) throws an exception	IV	CO2
2M -5	Match the following 1) charAt () a) to extract more than one character at a time from a string. 2) getchars () b) to extract a single character from a string. 3) getBytes() c) it returns an array of characters for the entire string. 4) toCharArray() d) to store the characters in an array of bytes.	I	CO2

5 - MARKS QUESTIONS

2D-1.	Explain the concept of Exception handling in Java. What are the main benefits of using exception handling in Java programming?	II	CO2
2D-2.	Explain the purpose of the try, catch, and finally blocks in Java's exception handling. Provide a code example to illustrate their usage.	VI	CO2
2D-3.	Discuss the Java exception hierarchy. What is the significance of the Throwable class, and how does it relate to Error and Exception?	IV	CO2

2D-4.	How can you create your own custom exception subclass in Java? Provide an example of when and why you might create a custom exception.	VI	CO2
2D-5.	Explain the purpose of the try and catch, Provide a code example to illustrate their usage.	III	CO2
2D-6.	Explain indetail about Random access file.	I	CO2
2D-7.	Explain about stream and Discuss different operations on streams.	I	CO2
2D-8	Discuss indetail about filtered byte Streams.	II	CO2
2D-9	Define file class and explain in detail about fields and methods of file.	V	CO2
D-10	Define Byte stream class and explain about input and output stream classes.	II	CO2

UNIT-III: Packages & Collections

Multiple Choice Questions		BT Level	Course Outcome
3C-1	A class member declared protected becomes a member of subclass of which type? [] a) public member b) private member c) protected member d) static member	I	CO3
3C-2	Which of these keywords is used to define packages in Java? [] a) pkg b) Pkg c) package d) Package	I	CO3
3C-3	Which of the following package stores all the standard java classes? [] a) lang b) java c) util d) java.packages	III	CO3
3C-4of these can be used to fully abstract a class from its implementation? a) Objects [] b) Packages c) Interfaces d) None of the Mentioned	I	CO3
3C-5	Which of these packages contains abstract keyword? [] a) java.lang b) java.util c) java.io d) java.system	IV	CO3
3C-6	Which system property stores installation directory of JRE? [] a) user.home b) java.class.path c) java.home d) user.dir	I	CO3

3C-7	What is Collection in Java? a) A group of objects b) A group of classes c) A group of interfaces d) None of the mentioned	I	CO3
3C-8	Which of these methods deletes all the elements from invoking collection? a) clear() b) reset() c) delete() d) refresh()	II	CO4
3C-9	Which of this interface is not a part of Java's collection framework? a) List b) Set c) SortedMap d) SortedList	II	CO4
3C-10	Which of these classes is not part of Java's collection framework? a) Maps b) Array c) Stack d) Queue	I	CO4

Fill in the blanks

3F-1	A _____ variable is a variable that is shared by all objects of a class.	II	CO3
3F-2	While creating a package, you should choose a name for the package and include a _____ statement	II	CO3
3F-3	A class ___ an interface, while a class ___ an abstract class.	I	CO3
3F-4	An Interface cannot contain a _____ methods.	II	CO3
3F-5	_____ is an environment variable which is used by Application Class Loader to locate and load the .class files.	II	CO3
3F-6	Collection is a _____,	I	CO3
3F-7	An interface is a _____.	II	CO3
3F-8	_____ is the root interface of the Java Collections Framework?	II	CO4
3F-9	_____ class provides a sorted Map implementation?	III	CO4
3F-10	_____ method is used to add an element to the end of a list?	IV	CO4

Match the following			
3M-1	Match the following 1) Inheritance 2) Interface 3) Package 4) Import pkg.*	a) Used to specify the behavior of class b) Importing classes or interfaces c) importing entire package d) Default package	II CO3
3M - 2	Match the following 1) java.applet 2) java.awt 3) java.awt.image 4) java.io	a) provides for system input & output b) creating and modifying image c) Contains collection frameworks d) Provides graphical user interface	III CO3
3M - 3	Match the following 1) CLASSPATH 2) Built-in-package 3) Importing all the classes 4) Scanner classes	a) java.lang b) java.util.Scanner c) An environment variable d) packagename.*	II CO4
3M - 4	Match the following 1) Collection 2) Interfaces 3) List 4) Set	a) allows duplicates b) used to store and retrieve data c) does not allow duplicates d) behavior of collections	VI CO4
3M - 5	Match the following 1) List 2) PriorityQueue class 3) Comparable Interface 4) Comparator Interface	a) used to compare itself with other objects b) collection interfaces c) used to compare two different objects d) implements Queue interface	III CO4
5 - MARKS QUESTIONS			
3D-1.	Define Package and explain how to access package from another package.		II CO3
3D-2.	Explain about CLASSPATH, and how to set CLASSPATH.		II CO3
3D-3.	Discuss in details about access specifiers.		II CO3
3D-4.	Explain about utility classes and what are advantages of utility classes.		CO3
3D-5.	Explain about String Tokenizers, methods if stringtokenizers in detail.		II CO3
3D-6.	What is the Java Collection Framework? List the main interfaces of the Collection Framework?		VI CO4
3D-7.	Explain the difference between ArrayList and LinkedList with example.		IV CO4
3D-8	Discuss briefly about methods involved in Collection interface.		II CO4
3D-9	List the methods used in Random and Formatter Collection classes with examples.		III CO4
3D-10	Differentiate Comparable and Comparator interface.		II CO4

UNIT-IV : Multithreading & Java Database Connectivity

	Multiple Choice Questions	BT Level	Course Outcome
4C-1	What is a thread in Java? [] a) A light process that runs independently within a program b) A type of loop c) An data structure to store variables d) A synchronization mechanism	II	CO5
4C-2	Which interface is used to create a thread in java? [] a)Processor b)Executor c)Threadable d)Runnable	I	CO5
4C-3	What is the main advantage of using multithreading in Java programs? [] a)Reduced memory usage b)Simplicity of code c)Improved program performance by utilizing multiple CPU's or CPU cores d)Elimination of exceptions	III	CO5
4C-4	What is the purpose of the start() method in Java thread? [] a)It resumes the execution of a thread b)It suspends the execution of a thread c)It starts the execution of a new thread d)It stops the execution of a thread	I	CO5
4C-5	In Java event handling, what is the delegation event model? [] a) It's a model that delegates event handling to the operating system. b) It's a model where event sources delegate event handling to registered listeners. c) It's a model that delegates event handling to the user interface thread. d) It's a model used for database event handling.	I	CO5
4C-6	Which keyword is used to declare a synchronized method in Java? [] a) sync b) lock c) thread-safe d) synchronized	IV	CO5
4C-7	Which of the following is the primary purpose of JDBC? a) To create Java applications. b) To connect Java applications to databases. c) To manage file systems. d) To develop web applications.	I	CO5
4C-8	Which class in JDBC is responsible for establishing a connection to a database? a) Statement b) ResultSet c) DriverManager d) Connection	V	CO5

4C-9	Which JDBC interface is used to execute a SQL query and retrieve the results? a) Connection b) Statement c) ResultSet d) DriverManager	I	CO5
4C-10	Which method is used to execute an SQL INSERT, UPDATE, or DELETE query in JDBC? a) executeQuery() b) executeUpdate() c) next() d) get()	VI	CO5

Fill in the blanks

4F-1	_____ method of Thread class is used to Suspend a thread for a period of time?	I	CO5
4F-2	_____ method of Thread class is used to find out the priority given to a thread?	I	CO5
4F-3	_____ class is used to create a thread in java.	I	CO5
4F-4	_____ method is used to start the execution of a thread.	I	CO5
4F-5	The _____ interface is used to define tasks that can be executed asynchronously.	I	CO5
4F-6	In java, the _____ keyword is used to define a synchronized block of code.	I	CO5
4F-7	_____ is the role of the DriverManager in JDBC?	I	CO5
4F-8	Expand JDBC and ODBC	I	CO5
4F-9	_____ driver translates JDBC calls into ODBC calls and use Windows ODBC built in drivers.	I	CO5
4F-10	_____ method executes a simple query and returns a single Result Set object?	I	CO5

Match the following

4M-1	Match the following 1) Process 2) Thread 3) start() 4) run()	a) Ready state b) Separate memory space for each process c) Running state d) Lightweight sub-process	I	CO5
4M -2	Match the following 1) New state 2) Runnable state 3) Block state 4) Termination state	a) Ready state b) Wait state c) Dead state d) Born state	II	CO5
4M -3	Match the following 1) Mutual Exclusion 2) Inter Thread Communication 3) Sleep(long) 4) Join()	a) Moves the thread to blocked state b). Waits for the thread to end c) Synchronization method d) wait()	III	CO5
4M -4	Match the following 1) Type1 driver 2) Type2 driver 3) Type3 driver 4) Type4 driver	a) it uses middleware b) JDBC calls directly into the vendor database protocol c) ODBC driver d) it uses client-side libraries	II	CO5
4M -5	Match the following 1) Driver manager 2) Driver 3) Statement 4) Connection	a) interact with the Database b) execute() c) manages the JDBC drivers d) base interface	IV	CO5

5 - MARKS QUESTIONS

4D-1.	Define and discuss in detail about Multithreading?	III	CO5
4D-2.	Differentiate thread-based multitasking and process-based multitasking?	IV	CO5
4D-3.	Discuss about java thread life cycle with neat diagram.	III	CO5
4D-4.	Explain in detail about thread priority with examples.	II	CO5
4D-5.	With proper syntax and example explain following thread methods : (1) wait() (2) sleep() (3) resume() (4) notify()	IV	CO5
4D-6.	Write a program to create two threads, so one thread will print even numbers between 1 to 10 whereas other will print odd numbers between 11 to 20.	VI	CO5
4D-7.	Explain about Thread Synchronization with example	II	CO5
4D-8	Write a java program to solve the Producer-Consumer problem using Inter-Thread Communication process.	VI	CO5
4D-9	Explain about JDBC	II	CO5
4D-10	.Explain about types of drivers with neat diagram.	II	CO5
4D-11	Discuss basic steps involved in developing JBC application.	III	CO5
4D-12	How to create a new database and table in java?	I	CO5
4D-13	Explain about JDBC Architecture with neat diagram.	II	CO5
4D-14	List the JDBC Classes and Interfaces	II	CO5
4D-15	Write a Java program using JDBC to extract name of those students who live in RR district, assuming that the student table has four attributes (ID, name, district, and age).	VI	CO5

UNIT-V: GUI Programming With Swing & Event Handling

Multiple Choice Questions		BT Level	Course Outcome
5C-1	Which of the following architecture does the swing framework use? [] a) MVC b) MVP c) Layered architecture d) Master-slave architecture	I	CO6
5C-2	What does GUI stand for? [] (a) Graphic User Interface (b) Global User Interface (c) Graphical User Interface (d) Generic User Interface	II	CO6

5C-3	Which package contains the Java Swing classes? (a) java.awt (b) java.swing (c) java.gui (d) javax.swing	[]	I	CO6
5C-4	In Java , how many types of events are there? a) 5 b) 3 c) 2 d) 4	[]	III	CO6
5C-5	What is the primary motivation behind the creation of Swing as GUI framework? a) To replace the AWT framework b) To provide a platform-independent and modern GUI framework c) To work only with native platform components d) To simplify the server-side development	[]	IV	CO6
5C-6	Which class is used as the base class for all Swing components? (a) Component (b) Container (c) JComponent (d) JFrame	[]	I	CO6
5C-7	Which layout manager is used by default for JFrame? (a) BorderLayout (b) FlowLayout (c) GridLayout (d) CardLayout	[]	I	CO6
5C-8	Which event listener interface is used for handling button click events? (a) MouseListener (b) ActionListener (c) KeyListener (d) FocusListener	[]	I	CO6
5C-9	Which of these packages contains all the classes and methods required for event handling in Java? a) java.applet b) java.awt c) java.event d) java.awt.event	[]	IV	CO6
5C-10	What is a listener in context to event handling? a) A listener is a variable that is notified when an event occurs b) A listener is a object that is notified when an event occurs c) A listener is a method that is notified when an event occurs d) None of the mentioned	[]	I	CO6

Fill in the blanks

5F-1	The basic class for all SWING UI components is _____?	I	CO6
5F-2	A ____ control is a dialogue window that allows the user to pick a file?	I	CO6
5F-3	An ____ is a change in the state of an item?	I	CO6
5F-4	To manage events, Java employs the ____?	I	CO6
5F-5	_____ is a container for other components and is used to build bespoke panels for organizing and arranging components?	I	CO6
5F-6	_____ are classes that act as a connection point between event listeners and event sources?	I	CO6
5F-7	Among AWT and Swing, _____ is platform independent?	I	CO6
5F-8	An _____ is a short software that runs in a web browser.	I	CO6
5F-9	_____ methods are used to register a mouse motion listener?	I	CO6
5F-10	_____ method can be used to determine the type of event?	I	CO6

Match the following

5M-1	Match the following 1) JComponent 2) JFrame 3) AWT 4) Swing	a) Heavy weight b) Container and one of the base classes of swing c) Light weight d) AWT Frame class	I	CO6
5M -2	Match the following 1) Item Listeners 2) Event Listeners 3) Windows Listeners 4) Focus Listeners	a) Deactivated, activated, open or quit. b) selecting or deselecting items in components. c) component gains or losses keyboard focus d) java.awt.event	I	CO6
5M -3	Match the following 1) Button 2)Check box 3)Text components 4)List	a) when user enters a character b) Generates action events by clicking c) When an item is double clicked d) when the item selected or deselected	III	CO6
5M -4	Match the following 1) Flow Layout 2) Border Layout 3) Grid Layout 4) Card Layout	a) Divides the container into five regions b) Allows multiple components to share the same space c) Arranges components in a single row d) Arranges components in a rows and columns	II	CO6
5M -5	Match the following 1) init () 2) Start()	a) it destroys the Applet program b) initialization of an Applet	VI	CO6

	3) Stop () 4) Destroy()	c) execution of an Applet code. d) the applet can stop its execution		
5 - MARKS QUESTIONS				
5D-1.	List the limitations of AWT?		III	CO6
5D-2.	Explain about MVC architecture and its Components.		II	CO6
5D-3.	What are the difference between AWT and Swing?		VI	CO6
5D-4.	Explain Applet life cycle with neat diagram.		II	CO6
5D-5.	Explain about any three Swing components.		III	CO6
5D-6.	Write a java program for Calculator using layouts in Swings.		VI	CO6
5D-7.	List the JDBC Event Listeners and the Event Classes.		III	CO6
5D-8	Write a java program for handling Mouse Events.		II	CO6
5D-9	Design a simple application using GUI Swing.		VI	CO6
5D-10	Write a java program for handling Key Events		VI	CO6
5D-11	List the Layout Manager Classes in GUI programming with swing.		III	CO6
5D-12	Explain different types of Layouts with example program.		VI	CO6
5D-13	Explain the Delegation event model in Event Handling.		II	CO6
5D-14	Explain any four applet tag with example.		II	CO6
5D-15	Explain about the Adapter class with example.		II	CO6

MID I & II

QUESTION PAPER



SRI INDU COLLEGE OF ENGINEERING & TECHNOLOGY

(An Autonomous Institution under UGC, New Delhi) - Recognized under 2(f) and 12(B) of UGC Act 1956

II B.Tech. II Semester (REGULAR and SUPPL.) End Examinations, July – 2023.

(R20CSE2204) JAVA PROGRAMMING

28/07/2023 (For CSE, IT, CS, AIML, AIDS, DS, IoT and CSIT) Day- 5 (FN)

Duration: 3 Hrs

Maximum Marks: 70M

Blooms Taxonomy : (I-Remembering, II-Understanding, III-Applying, IV-Analyzing, V-Evaluating and VI-Creating)

Course Outcomes : CO

PART - A

Answer all the following questions.

(5Qx 4M = 20M)

1. Write a program to convert upper case to lower case by using string handling mechanism. I CO1
2. Explain about the random access file operations. II CO2
3. Explain the types of Exceptions. II CO3
4. What is the significance of Legacy Class with an example? I CO4
5. Explain the methods used in JRadioButton. II CO5

PART - B

Answer FIVE questions choosing at least one from each unit

(5Qx10M =50M)

UNIT-I

6. a) Explain the logical operators used in java. II CO1
b) Write a program to find the multiplication table of n number from 1 to 10. I CO1
- OR
7. a) Write a program which has an abstract class solid and implements Cylinder, Cone and sphere by inheriting from solid to find the area and volume. III CO1
b) What is the use of final? I CO1

UNIT-II

8. a) Explain about the character stream classes in java. II CO2
b) What is an interface? Explain the nested interface with an example. I CO2
- OR
9. a) What are the benefits of using packages? I CO2
b) Write a program to display the bytes of a file in reverse sequence. Provide the name of the file is a command line argument. III CO2

UNIT-III

10. a) Write a program to illustrate the multiple catch exceptions. I CO3
b) Explain about the inter thread communication. II CO3
- OR
11. Write a program to implement a producer and consumer problem by using multithreading. V CO3

P.T.O.

UNIT-IV

12. a) Write a program to remove all empty strings from List by using collector class. IV CO4
b) Explain about the String Tokenizer with an example. II CO4

OR

13. a) Explain the Bit Set and Calender classes in detail. II CO4
b) Write a program to illustrate the Priority Queue. I CO4

UNIT-V

14. Write a program that contains a combo box and a label-the label displays an icon. VI CO5
The combo box contains entries for "France", "Germany", "India" and "USA".
When a country is selected, the label is updated to display the flag for that country.

OR

15. a) Explain about the different types of layout managers are used in java. II CO5
b) Write an applet to draw the cube, ellipse and circle shapes. IV CO5

DA - AUTONOMOUS

Duration: 2 Hrs

Dt: 26-03-2025, Day-3 (FN)

Max Marks: 30M

Blooms Taxonomy Levels : I-Remembering, II-Understanding, III-Applying, IV-Analyzing, V-Evaluating, and VI-Creating.

Course Outcomes: CO

Part - A (10 Marks)

SECTION A1: Answer All multiple choice questions.

Marks: 10Qx1/2M = 5M

- | | | | |
|--|-----|-----|-----|
| 1. Which of the following is not an OOPS concept in Java? | [] | I | CO1 |
| A) Polymorphism B) Inheritance | | | |
| C) Compilation D) Encapsulation | | | |
| 2. What is the extension of compiled java classes? | [] | I | CO1 |
| A) .txt B) .js C) .class D) .java | | | |
| 3. Which one of the following is not an access modifier? | [] | IV | CO1 |
| A) Protected B) Void C) Public D) Private | | | |
| 4. Which of the following is a method having same name as that of its class? | [] | I | CO1 |
| A) finalize B) delete C) class D) constructor | | | |
| 5. Which of the following is not a part of exception handling in Java? | [] | II | CO2 |
| A) Try B) catch C) throw D) static | | | |
| 6. Which keyword is used to explicitly throw an exception in Java? | [] | III | CO2 |
| A) Throws B) throw C) try D) catch | | | |
| 7. Which of these methods are used to read in from file? | [] | III | CO2 |
| A) get() B) read() C) scan() D) read File Input() | | | |
| 8. Which of these class contains the methods used to write in a file? | [] | I | CO2 |
| A) File Stream B) File Input Stream | | | |
| C) Buffered Output Stream D) File Buffer Stream | | | |
| 9. A class member declared protected becomes a member of subclass of which type? | [] | I | CO3 |
| A) public member B) private member | | | |
| C) protected member D) static member | | | |
| 10. Which of the following package stores all the standard java classes? | [] | III | CO3 |
| A) lang B) java C) util D) java.packages | | | |

SECTION A2: Answer All fill in the blank questions.

Marks: 6Qx1/2M = 3M

- | | | |
|--|-----|-----|
| 11. The four pillars of OOP are _____, _____, _____, and _____ | III | CO1 |
| 12. The _____ keyword is used to create an object of a class. | III | CO1 |
| 13. The ability to take more than one forms is called _____ | III | CO1 |
| 14. The keyword used to explicitly throw an exception in Java is _____ | IV | CO2 |
| 15. Try must be followed by either _____ or _____ | I | CO2 |
| 16. A _____ variable is a variable that is shared by all objects of a class. | II | CO3 |

SECTION A3: Answer All Match the following questions

Marks: 2Qx1M = 2M

17.

1.	Public	A.	Accessing the data members inside the class
2.	Private	B.	within the same package or subclasses in different packages.
3.	Default	C.	Accessing the data members & member functions outside the class
4.	Protected	D.	When we don't use any keyword explicitly.

II CO1

18.

1.	try block	A.	Must be executed
2.	catch block	B.	It contains exception thrown out of method
3.	finally block	C.	throw an exception try to catch
4.	throw block	D.	Can raise exceptions

III CO2

Part – B (20 Marks)

Answer any **FOUR** questions.

Marks: 4Qx5M = 20M

19. Explain about Features of Java. I CO1
20. Define Polymorphism and explain about Method overloading and Method Overriding. III CO1
21. Define inheritance, Develop a java program on multilevel inheritance. VI CO1
22. Explain the concept of Exception handling in Java. What are the main benefits of using exception handling in Java programming? II CO2
23. Discuss in detail about filtered byte Streams. II CO2
24. Define Package and explain how to access package from another package. II CO3
