



Lr.No.SICET/AUTO/DAE/BR-20/Academic Cal./46-C/2022

Date: 07.05.2022

REVISED I B.TECH. ACADEMIC CALENDAR
ACADEMIC YEAR : 2021-2022

Dr.G. SURESH,
Principal,

To,
All the HODs
Sir,

Sub: SICET (Autonomous) - Academic & Evaluation - Academic Calendar for **I B.Tech - I & II Semester**
for the academic year **2021-22** – Reg.

The approved Academic Calendar for **I B.Tech – I & II Semester** for the academic year **2021-22** is given below:

I SEMESTER

S.NO.	EVENT	PERIOD	DURATION
1.	Induction & Orientation Programme	24.11.2021	
2.	1 st Spell of Instructions for covering First Two and a half Units	29.11.2021 – 22.01.2022	8 Weeks
3.	I Mid Examinations	24.01.2022 – 29.01.2022	1 Week
4.	Submission of I Mid Term Examination Marks on or before	05.02.2022	
6.	2 nd Spell of Instructions for covering Remaining Two and a half Units	31.01.2022 – 29.03.2022	8 Weeks & 2 Days
7.	II Mid Examinations	30.03.2022 – 02.04.2022	4 Days
8.	Submission of II Mid Term Examination Marks on or before	09.04.2022	
9.	Preparation & Practical Examinations	04.04.2022 – 09.04.2022	1 Week
10.	I Semester End Examinations	11.04.2022 – 23.04.2022	2 Weeks

Commencement of Class-Work for I B.Tech - II Semester 25.04.2022

II SEMESTER

S.NO.	EVENT	PERIOD	DURATION
1.	Commencement of II Sem Class Work	25.04.2022	
2.	1st Spell of Instructions for covering First Two and a half Units	25.04.2022 – 14.05.2022	3 Weeks
3.	Summer Vacation.	15.05.2022 – 29.05.2022	2 Weeks
4.	Continuation of 1 st Spell of Instructions.	30.05.2022 – 02.07.2022	5 Weeks
5.	I Mid Examinations	04.07.2022 – 06.07.2022	3 Days
6.	Submission of I Mid Term Examination Marks on or before	11.07.2022	
7.	2nd Spell of Instructions for covering Remaining Two and a half Units	07.07.2022 – 31.08.2022	8 Weeks
8.	II Mid Examinations	01.09.2022 – 03.09.2022	3 Days
9.	Submission of II Mid Term Examination Marks on or before	09.09.2022	
10.	Preparation & Practical Examinations	05.09.2022 – 10.09.2022	1 Week
11.	II Semester End Examinations	12.09.2022 – 24.09.2022	2 Weeks

Commencement of Class Work for II B.Tech – I Semester - 26.09.2022

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DIRECTOR

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PRINCIPAL



REVISED II B.TECH ACADEMIC CALENDAR
ACADEMIC YEAR : 2021-2022

Dr. G. SURESH,
Principal,

To,
All the HODs
Sir,

Sub: SICET (Autonomous) - Academic & Evaluation - Academic Calendar for
II B.Tech - I & II Semester for the academic year **2021-22** - Reg.

The approved Academic Calendar for **II B.Tech - I & II Semester** for the academic year **2021-22** is given below:

ACADEMIC CALENDAR - II B.TECH - I & II SEMESTER
ADMITTED BATCH - 2020-2021 of BR-20 Regulation

I SEMESTER

SNO	EVENT	PERIOD	DURATION
1.	Commencement of Class Work	21-10-2021	
2.	1 st Spell of Instructions for covering First Two and a half Units	21.10.2021 – 15.12.2021	8 Weeks
3.	I Mid Examinations	16.12.2021 – 18.12.2021	3 Days
4.	Submission of I Mid Term Examination Marks	24-12-2021	
5.	2 nd Spell of Instructions for covering Remaining Two and a half Units	20.12.2021 – 12.02.2022	8 Weeks
6.	II Mid Examinations	14.02.2022 – 16.02.2022	3 Days
7.	Submission of II Mid Term Examination Marks	22-02-2022	
8.	Preparation & Practical Examinations	17.02.2022 – 23.02.2022	1 Week
9.	I Semester End Examinations.	24.02.2022 – 09.03.2022	2 Weeks
Commencement of Class-Work for II B.Tech - II Semester 10.03.2022.			

II SEMESTER

SNO	EVENT	PERIOD	DURATION
1.	Commencement of II Sem Class Work	10.03.2022	
2.	1 st Spell of Instructions for covering First Two and a half Units	10.03.2022 – 04.05.2022	8 Weeks
3.	I Mid Examinations	05.05.2022 – 07.05.2022	3 Days
4.	Submission of I Mid Term Examination Marks	13-05-2022	
5.	2 nd Spell of Instructions for covering Remaining Two and a half Units	09.05.2022 – 14.05.2022	1 Week
6.	Summer Vacation	15.05.2022 – 29.05.2022	2 Weeks
7.	Continuation of 2 nd Spell of Instructions.	30.05.2022 – 16.07.2022	7 Weeks
8.	II Mid Examinations	18.07.2022 – 20.07.2022	3 Days
9.	Submission of II Mid Term Examination Marks	26-07-2022	
10.	Preparation & Practical Examinations	21.07.2022 – 28.07.2022	1 Week
11.	II Semester End Examinations.	29.07.2022 – 12.08.2022	2 Weeks
Commencement of Class Work for III B.Tech - I Semester - 17.08.2022			

Copy to
Copy to all the Heads of the Departments

CONTROLLER OF EXAMINATIONS
Sri Indu College of Engineering & Technology
(An Autonomous Institution under JNTUH)
Sheriguda (V), Ibrahimpatnam, R.R.Dist-501510

DIRECTOR
(Academic Audit)
Sri Indu College of Engineering & Technology
Sheriguda, IBP, R.R. Dist-501510.

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



Lr.No.SICET/AUTO/DAE/Rev. Academic Calendar/46-A/2022

Dt: 07.05.2022

Dr.G. SURESH, Principal,

To, All the HODs.

REVISED ACADEMIC CALENDAR : 2021-22

Sir,

Sub: SICET (Autonomous) - Academic & Evaluation - Revised Academic Calendar For B.Tech - 3rd Year - For the academic year 2021-22 - Reg.

The approved Revised Academic Calendar for B.Tech - 3rd Year (I & II Sem) for the academic year 2021-22 is given below:

B.Tech 3rd Year for (2019 - 20 Batch) BR - 18 Regulation

Revised Academic Calendar for B.Tech - 3rd Year Students

I - Semester

Table with 3 columns: Activity, Start Date, End Date/Duration. Includes rows for Commencement of class work (06.09.2021), 1st Spell of Instructions, I Mid Examinations, 2nd Spell of Instructions, II Mid Examinations, Preparation Holidays & Practical Examinations, III Year Semester End Examinations, and Commencement of class work of 3rd Year II Semester (03.03.2022).

II - Semester

Table with 3 columns: Activity, Start Date, End Date/Duration. Includes rows for Commencement of class work (03.03.2022), 1st Spell of Instructions, I Mid Examinations, Submission of I Mid Term Examination Marks, 2nd Spell of Instructions, Summer Vacation, Continuation of 2nd Spell of Instructions, II Mid Term Examinations, Submission of II Mid Term Examination Marks, Preparation Holidays & Practical Examinations, End Semester Examinations, and Commencement of class work for the A.Y. (2022-23) (10.08.2022).

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PRINCIPAL

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DIRECTOR

PRINCIPAL



Lr.No.SICET/AUTO/DAE/Academic Calendar/406/2021

Dt: 28.08.2021

Dr.G. SURESH,
Principal,

To,
All the HODs.

Approved
M. Neelakrishnaiah
21/10/21.

ACADEMIC CALENDAR : 2021-22

Sir,

Sub: SICET (Autonomous) - Academic & Evaluation - Academic Calendar for
B.Tech – 3rd & 4th Year - For the academic year **2021-22** – Reg.

The approved Academic Calendar for **B.Tech – 3rd & 4th Year (I & II Sem)**
 for the academic year **2021-22** is given below:

- **B.Tech 3rd Year for (2019 - 20 Batch) BR - 18 Regulation**
- **B.Tech 4th Year for (2018 - 19 Batch) BR - 18 Regulation**

Academic Calendar for B.Tech – 3rd & 4th Year Students

I - Semester

Commencement of class work	06.09.2021 (Monday)	
I Spell of Instructions (Including CRT & Dasara Holidays).	06.09.2021	06.11.2021 – 9 Weeks
I Mid Examinations for III & IV Year Students.	08.11.2021	13.11.2021 - 1 Week
II Spell of Instructions.	15.11.2021	08.01.2022 - 8 Weeks
II Mid Examinations for III & IV Year Students.	10.01.2022	18.01.2022 - 1 Week
Preparation Holidays & Practical Examinations.	19.01.2022	25.01.2022 - 1 Week
III & IV Semester End Examinations (Regular).	27.01.2022	09.02.2022 - 2 Weeks
Supplementary Examinations and Placements	10.02.2022	23.02.2022 - 2 Weeks
Commencement of class work of 3rd & 4th Year II Semester - 10.02.2022 (Thursday)		

II - Semester

Commencement of class work	10.02.2022 (Thursday)	
I Spell of Instructions.	10.02.2022	06.04.2022 - 8 Weeks
I Mid Examinations for III & IV Year Students.	07.04.2022	13.04.2022 - 1 Week
II Spell of Instructions (Including Summer Vacation).	16.04.2022	24.06.2022 - 10 Weeks
II Mid Examinations for III & IV Year Students.	25.06.2022	01.07.2022 - 1 Week
Preparation Holidays & Practical Examinations, Project Evaluation (IV B.Tech).	02.07.2022	09.07.2022 - 1 Week
End Semester Examinations for (III & IV B.Tech).	11.07.2022	23.07.2022 - 2 Weeks
Supplementary Examinations and Placements	25.07.2022	06.08.2022 - 2 Weeks
Commencement of class work for the A.Y. (2022-23) - 10.08.2022 (Wednesday)		

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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

SECOND YEAR CSE (CS)-SEMESTER-I

**DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING
(CYBER SECURITY)**

ACADEMIC YEAR 2021-22

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING
(CYBER SECURITY)

HANDOUT- INDEX

S. No	Contents
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iii)	Question Bank
iv)	End Examination Questions(Previous Academic Year/Model paper)
v)	Mid1 & Mid2 Questions (Previous Academic Year/Model Paper)



SRI INDU COLLEGE OF ENGINEERING & TECHNOLOGY
B. TECH –DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING (CS)

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 technologically adaptive center for computing by grooming the students as top notch professionals.

DEPARTMENT MISSION

The Department has following Missions:

- DM₁** To offer quality education in computing.
- DM₂** To provide an environment that enables overall development of all the stakeholders.
- DM₃** To impart training on emerging technologies like data analytics, artificial intelligence and internet of things.
- DM₄** To encourage participation of stake holders in research and development.

PROGRAM EDUCATIONAL OBJECTIVES (PEOs)

- PEO1:** **Higher studies:** Graduates with an ability to pursue higher studies and get employment in reputed institutions and organization.
- PEO2:** **Domain knowledge:** Graduates with an ability to design and develop a product.
- PEO3:** **Professional career:** Graduates with excellence by multidisciplinary approach to achieve successful professional career.
- PEO4:** **Life Long Learning:** Graduates with an ability to learn advanced skills to face professional competence through lifelong learning.

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

PO	Description
PO 1	Engineering Knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO 2	Problem Analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO 3	Design / development of Solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO 4	Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO 5	Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
PO 6	The engineer and Society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
PO 7	Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO 8	Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice
PO 9	Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO 10	Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO 11	Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO 12	Lifelong learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological Change
Program Specific Outcomes	
PSO 1	Develop software projects using standard practices and suitable programming environment.
PSO 2	Identify, formulate and solve the real life problems faced in the society, industry and other areas by applying the skills of the programming languages, networks and databases learned.
PSO 3	To apply computer science knowledge in exploring and adopting latest technologies in different co-curricular activities.

COs MAPPING WITH POs & PSOs

ANALOG AND DIGITAL ELECTRONICS

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

Course Outcomes	Statements
C211.1	Know the characteristics of various components.
C211.2	Understand the utilization of components.
C211.3	Design and analyze small signal amplifier circuits.
C211.4	Learn Postulates of Boolean algebra and to minimize combinational functions
C211.5	Design and analyze combinational and sequential circuits
C211.6	Know about the logic families and realization of logic gates.

Course Articulation Matrix:

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C211.1	3	2	-	-	-	-	-	-	-	-	-	3	3	2	-
C211.2	3	3	3	2	-	-	-	-	-	-	-	3	3	2	-
C211.3	3	3	3	2	-	-	-	-	-	-	-	2	3	3	-
C211.4	3	3	3	3	-	-	-	-	-	-	-	3	3	2	-
C211.5	3	3	3	3	-	-	-	-	-	-	-	2	3	2	-
C211.6	3	3	3	3	-	-	-	-	-	-	-	2	3	2	-
C211	3	2.8	3	2.6	-	-	-	-	-	-	-	2.5	3	2.1	-

DATA STRUCTURES

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

Course Outcomes	Statements
C212.1	Ability to select the data structures that efficiently model the information in a problem.
C212.2	Ability to assess efficiency trade-offs among different data structure implementations or combinations
C212.3	Implement and know the application of algorithms for sorting and searching
C212.4	Design programs using a variety of data structures including hash tables, binary and general tree structures, search trees, tries, heaps, graphs and AVL –trees
C212.5	Demonstrate sound understanding of graph traversals and ability to implement algorithms on graphs.
C212.6	Illustrate the concept of Text pattern matching algorithm

Course Articulation Matrix:

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C212.1	1	2	2	-	3	-	-	-	1	-	-	-	2	1	-
C212.2	2	1	-	2	2	-	-	-	-	-	-	-	1	-	1
C212.3	3	-	2	-	-	-	-	-	-	-	1	-	2	-	-
C212.4	2	-	-	-	-	-	-	-	-	-	-	-	2	2	1
C212.5	1	2	2	-	3	-	-	-	1	-	-	-	2	1	-
C212.6	2	1	2	-	3	-	-	-	-	-	-	-	2	1	2
C212	1.8	1.5	2	2	2.75	-	-	-	1	-	1	-	1.8	1	1.3

MATHEMATICAL AND STASTICAL FUONDATION

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

Course Outcomes	Statements
C213.1	Apply the number theory concepts to cryptography domain.
C213.2	Apply the concepts of probability and distributions to some case studies.
C213.3	Calculate the areas under the normal curve& applications of the normal distribution.
C213.4	Analyze the fundamental sampling distributions.
C213.5	Test the Hypothesis of single mean, double mean, single proportion, double proportion.
C213.6	Evaluate Transition Probability matrix.

Course Articulation Matrix:

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C213.1	3	2	2	2	-	-	-	-	-	-	-	3	2	3	-
C213.2	3	3	2	2	-	-	-	-	-	-	-	3	3	3	-
C213.3	3	3	3	2	-	-	-	-	-	-	-	3	2	3	-
C213.4	3	3	3	3	-	-	-	-	-	-	-	3	3	3	-
C213.5	3	3	3	3	-	-	-	-	-	-	-	2	3	3	-
C213.6	3	3	3	3	-	-	-	-	-	-	-	2	2	3	-
C213	3	2.8	2.7	2.5	-	-	-	-	-	-	-	2.7	2.5	3	-

COMPUTER ORGANIZATION AND ARCHITECTURE

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

Course Outcomes	Statements
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:

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C214.1	3	2	-	-	3	-	2	-	-	-	-	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	2.8	2.8	1.5

PYTHON PROGRAMMING

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

Course Outcomes	Statements
C215.1	Examine Python Syntax and Semantics and be fluent in the use of Python flow control and functions
C215.2	Demonstrate proficiency in handling Strings and File Systems.
C215.3	Create ,run and manipulate Python Programs using core data structure like List, dictionaries and user Regular Expressions
C215.4	1. Illustrate File Management, analyses different File Allocation Strategies, develop disk Scheduling Algorithms.
C215.5	Interpret the concepts of Object-Oriented Programming as used in Python.
C215.6	Implement exemplary applications related to Network Programming ,Web Services and Database in Python

Course Articulation Matrix:

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C215.1	2	-	-	-	2	-	-	-	-	-	-	-	2	1	1
C215.2	2	2	3	1	2	-	-	-	-	-	1	-	2	2	1
C215.3	2	2	2	1	2	-	-	-	-	-	1	2	2	2	1
C215.4	2	2	3	1	2	-	-	-	1	-	2	-	2	2	1
C215.5	2	2	-	2	2	1	-	-	1	-	2	2	2	1	2
C215.6	2	2	2	2	2	1	-	-	3	3	2	-	2	2	2
C215	2	2	2	1.5	2	1	-	-	1.3	3	1.6	2	2	1.6	1.3



SRI INDU COLLEGE OF ENGINEERING & TECHNOLOGY
(An Autonomous Institution under UGC, New Delhi)
Recognized under 2(f) and 12(B) of UGC Act 1956
NBA Accredited, Approved by AICTE and Permanently affiliated to JNTUH
Sheriguda (V), Ibrahimpatnam, R.R.Dist, Hyderabad - 501 510

D4
BR-20

LR.NO.SICET/AUTO/DAE/BR-20/ACADEMIC-CAL/421/2021

DATE: 09.10.2021

II B.TECH ACADEMIC CALENDAR
ACADEMIC YEAR : 2021-2022

Dr. G. SURESH,
Principal,

To,
All the HODs
Sir,

Sub: SICET (Autonomous) - Academic & Evaluation - Academic Calendar for
II B.Tech - I & II Semester for the academic year **2021-22** - Reg.

The approved Academic Calendar for **II B.Tech - I & II Semester** for the academic year **2021-22** is given below:

ACADEMIC CALENDAR - II B.TECH - I & II SEMESTER
ADMITTED BATCH - 2020-2021 of BR-20 Regulation

I SEMESTER

SNO	EVENT	PERIOD	DURATION
1.	Commencement of Class Work	21-10-2021	
2.	1 st Spell of Instructions for covering First Two and a half Units	21.10.2021 - 15.12.2021	8 Weeks
3.	I Mid Examinations	16.12.2021 - 18.12.2021	3 Days
4.	Submission of I Mid Term Examination Marks	24-12-2021	
5.	2 nd Spell of Instructions for covering Remaining Two and a half Units	20.12.2021 - 12.02.2022	8 Weeks
6.	II Mid Examinations	14.02.2022 - 16.02.2022	3 Days
7.	Submission of II Mid Term Examination Marks	22-02-2022	
8.	Preparation & Practical Examinations	17.02.2022 - 23.02.2022	1 Week
9.	I Semester End Examinations (Regular/Suppl.)	24.02.2022 - 09.03.2022	2 Weeks
10.	Supplementary Examinations for II Semester (BR-12, BR-14, BR-16 & BR-18 Regulations)	10.03.2022 - 23.03.2022	2 Weeks
Commencement of Class-Work for II B.Tech - II Semester 10.03.2022.			

II SEMESTER

SNO	EVENT	PERIOD	DURATION
1.	Commencement of II Sem Class Work	10.03.2022	
2.	1 st Spell of Instructions for covering First Two and a half Units	10.03.2022 - 04.05.2022	8 Weeks
3.	I Mid Examinations	05.05.2022 - 07.05.2022	3 Days
4.	Submission of I Mid Term Examination Marks	13-05-2022	
5.	2 nd Spell of Instructions for covering Remaining Two and a half Units	09.05.2022 - 02.07.2022	8 Weeks
6.	II Mid Examinations	04.07.2022 - 06.07.2022	3 Days
7.	Submission of II Mid Term Examination Marks	12-07-2022	
8.	Preparation & Practical Examinations	07.07.2022 - 13.07.2022	1 Week
9.	II Semester End Examinations (Regular/Suppl.)	14.07.2022 - 27.07.2022	2 Weeks
10.	Supplementary Examinations for I Semester (BR-12, BR-14, BR-16 & BR-18 Regulations)	28.07.2022 - 11.08.2022	2 Weeks
Commencement of Class Work for III B.Tech - I Semester - 01.08.2022			

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CE 9/10/21

Devi
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Suresh
PRINCIPAL 9/10/21
PRINCIPAL

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CONTROLLER OF EXAMINATIONS

DEAN, ACADEMIC AFFAIRS & EVALUATION
Sri Indu College of Engineering & Technology
(An Autonomous Institution under JNTUH)
Sheriguda (V), Ibrahimpatnam, R.R. Dist, 501 510

SRI INDU COLLEGE OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING (CS)
DEPARTMENT CALENDAR – 2021-2022 (SEMESTER-1)

DAYS												
SUNDAY			NOVEMBER '21						FEBRUARY'22		MARCH '22	
MONDAY		1										
TUESDAY		2		DECEMBER '21				1		1	I SEM END EXAMINATION	
WEDNESDAY		3		1				2		2	I SEM END EXAMINATION	
THURSDAY		OCTOBER '21		4	DIWALI		2			3	I SEM END EXAMINATION	
FRIDAY	1			5				JANUARY'22		4	I SEM END EXAMINATION	
SATURDAY	2	GANDHI JAYANTHI		6			1			5	I SEM END EXAMINATION	
SUNDAY	3	HOLIDAY		7	HOLIDAY		5	HOLIDAY		2	HOLIDAY	
MONDAY	4			8			3			6	HOLIDAY	
TUESDAY	5			9			4			7	I SEM END EXAMINATION	
WEDNESDAY	6			10			5			8	I SEM END EXAMINATION	
THURSDAY	7			11			6			9	I SEM END EXAMINATION	
FRIDAY	8			12			7			10	Commencement of I SPELL Classes (II Yr. II sem.)	
SATURDAY	9	TRADITIONAL DAY BATHUKAMMA		13			8			11	II LAB INTERNAL	
SUNDAY	10	HOLIDAY		14	HOLIDAY		12	HOLIDAY		9	HOLIDAY	
MONDAY	11			15			10	HOLIDAY		13	HOLIDAY	
TUESDAY	12			16			11	HOLIDAY		14	I LAB INTERNAL	
WEDNESDAY	13	MAHA ASHTAMI		17			12	HOLIDAY		15	II-MID EXAM	
THURSDAY	14			18			13	HOLIDAY		16	II-MID EXAM	
FRIDAY	15	VIJAYA DASHAMI		19	KARTHIKA PURNIMA		17	HOLIDAY		17	PRACTICAL EXAMINATION	
SATURDAY	16			20			18	HOLIDAY		18	PRACTICAL EXAMINATION	
SUNDAY	17	HOLIDAY		21	HOLIDAY		19	HOLIDAY		19	PRACTICAL EXAMINATION	
MONDAY	18			22			20	HOLIDAY		20	PRACTICAL EXAMINATION	
TUESDAY	19	EID E MILAD		23			21	HOLIDAY		21	PRACTICAL EXAMINATION	
WEDNESDAY	20			24			22	HOLIDAY		22	PRACTICAL EXAMINATION	
THURSDAY	21	Commencement of I SPELL Classes (II Yr. I sem.)		25			23	HOLIDAY		23	PRACTICAL EXAMINATION	
FRIDAY	22			26			24	HOLIDAY		24	I SEM END EXAMINATION	
SATURDAY	23			27			25	HOLIDAY		25	I SEM END EXAMINATION	
SUNDAY	24	HOLIDAY		28	HOLIDAY		26	HOLIDAY		26	I SEM END EXAMINATION	
MONDAY	25			29			27	HOLIDAY		27	I SEM END EXAMINATION	
TUESDAY	26			30			28	HOLIDAY		28	I SEM END EXAMINATION	
WEDNESDAY	27						29	HOLIDAY		29	I SEM END EXAMINATION	
THURSDAY	28						30	HOLIDAY		30	I SEM END EXAMINATION	
FRIDAY	29						31	HOLIDAY		31	I SEM END EXAMINATION	
SATURDAY	30	Workshop on Maching Learning & Activity on (MCQ,Crossword)						HOLIDAY			I SEM END EXAMINATION	
SUNDAY	31	HOLIDAY			HOLIDAY		30	HOLIDAY			HOLIDAY	
MONDAY							31	HOLIDAY			HOLIDAY	

ANALOG AND DIGITAL ELECTRONICS

COMPUTER SCIENCE & ENGINEERING (CYBER SECURITY)

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

B.Tech. - II Year – I Semester

L	T	P	C
3	0	0	3

(R20ECE2106) Analog and Digital Electronics

Course Objectives:

- To introduce components such as diodes, BJTs and FETs.
- To know the applications of components.
- To give understanding of various types of amplifier circuits.
- To learn basic techniques for the design of digital circuits and fundamental concepts used in the design of digital systems.
- To understand the concepts of combinational logic circuits and sequential circuits.

Course Outcomes: Upon completion of the Course, the students will be able to:

- Know the characteristics of various components.
- Understand the utilization of components.
- Design and analyze small signal amplifier circuits.
- Learn Postulates of Boolean algebra and to minimize combinational functions
- Design and analyze combinational and sequential circuits
- Know about the logic families and realization of logic gates.

UNIT - I

Diodes and Applications: Junction diode characteristics: Open circuited p-n junction, p-n junction as a rectifier, V-I characteristics, effect of temperature, diode resistance, diffusion capacitance, diode switching times, breakdown diodes, Tunnel diodes, photo diode, LED.

Diode Applications - clipping circuits, comparators, Half wave rectifier, Full wave rectifier, rectifier with capacitor filter.

UNIT - II

BJTs: Transistor characteristics: The junction transistor, transistor as an amplifier, CB, CE, CC configurations, comparison of transistor configurations, the operating point, self-bias or Emitter bias, bias compensation, thermal runaway and stability, transistor at low frequencies, CE amplifier response, gain bandwidth product, Emitter follower, RC coupled amplifier, two cascaded CE and multi stage CE amplifiers.

UNIT - III

FETs and Digital Circuits: FETs: JFET, V-I characteristics, MOSFET, low frequency CS and CD amplifiers, CS and CD amplifiers.

Digital Circuits: Digital (binary) operations of a system, OR gate, AND gate, NOT, EXCLUSIVE OR gate, De Morgan Laws, NAND and NOR DTL gates, modified DTL gates, HTL and TTL gates, output stages, RTL and DCTL, CMOS, Comparison of logic families.

UNIT - IV

Combinational Logic Circuits: Basic Theorems and Properties of Boolean Algebra, Canonical and Standard Forms, Digital Logic Gates, The Map Method, Product-of-Sums Simplification, Don't-Care Conditions, NAND and NOR Implementation, Exclusive-OR Function, Binary Adder-Subtractor, Decimal Adder, Binary Multiplier, Magnitude Comparator, Decoders, Encoders, Multiplexers.

COMPUTER SCIENCE & ENGINEERING (CYBER SECURITY)

UNIT - V

Sequential Logic Circuits: Sequential Circuits, Storage Elements: Latches and flip flops, Analysis of Clocked Sequential Circuits, State Reduction and Assignment, Shift Registers, Ripple Counters, Synchronous Counters, Random-Access Memory, Read-Only Memory.

TEXT BOOKS:

1. Integrated Electronics: Analog and Digital Circuits and Systems, 2/e, Jacob Millman, Christos Halkias and Chethan D. Parikh, *Tata McGraw-Hill Education*, India, 2010.
2. Digital Design, 5/e, Morris Mano and Michael D. Cilette, *Pearson*, 2011.

REFERENCE BOOKS:

1. Electronic Devices and Circuits, Jimmy J Cathey, *Schaum's outline series*, 1988.
2. Digital Principles, 3/e, Roger L. Tokheim, *Schaum's outline series*, 1994.



SRI INDU COLLEGE OF ENGG & TECH

LESSON PLAN

(Regulation :R20)

Department of Computer Science and Engineering(CS)

Prepared on:28.9.2021

Rev1:

Sub. Code & Title	(R20ECE2106) Analog and Digital Electronics		
Academic Year: 2021-22	Year/Sem./Section	II-I	
Faculty Name & Designation	SHAIK AZEERA BEGUM Assistant Professor		

Unit/ Item No	Topic (s)	Book Referen ce	Page (s)		Teaching Methodolo gy	Proposed No. of Periods	Actual Date of Handle d	CO/RB T	
			From	To					
UNIT-I									
I	DIODES AND APPLICATIONS					16			
1.1	Introduction	T- 1	84	98	Black board	01		CO1/L2	
1.2	Junctiondiode characteristics	T - 1	161	162	Black board	01		CO1/ L2	
1.3	Open circuited p-n junction	T - 1	117	119	Black board	01		CO1/ L2	
1.4	V-I characteristics	T - 1	161	162	Black board	01		CO1/ L2	
1.5	Effect of temperature	T - 1	183	189	PPT &black board	01		CO1/ L2	
1.6	Diode resistance, diffusion capacitance	T - 1	128,130	129,131	Black board	01		CO1/ L2	
1.7	P-N junction as a rectifier,	T-1	138	140	Black board	01		CO1/ L2	
1.8	Diode switching times	T-1			Black board	01		CO1/ L2	
1.9	Breakdown diodes, LED.	T-1	143	149	Black board	02		CO1/ L2	
1.10	Tunnel diodes, photo diode	T-1	150	155	Black board	02		CO1/ L2	
1.11	Diode Applications - clipping circuits, comparators	T- 1	227	229	Black board	03		CO1/ L2	
1.12	Half wave rectifier, Full wave rectifier	T-1	183,190	189,192	Black board	02		CO1/ L2	
1.13	Rectifier withcapacitor filter	T-1	202	204	Black board	01		CO1/ L2	
1.14	Tutorial					01			
	Review	Signature of the HOD/Coordinator							
Unit/ Item No.	Topic (s)	Book Referen ce	Page (s)		Teaching Methodolo gy	Propose d No. of Periods	Actual Date of Handle d	CO/RBT	
UNIT -II									
II									
2.1	The junction transistor,	T - 1	255	256	Black board	01		CO2/ L2	
2.2	CB, CE, CC configurations,	T - 1	264	274	Black board	02		CO2/ L2	



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2.3	The operating point, self-bias or Emitter bias, bias compensation	T-1	307,320,331	309,323,332	Black board	02		CO2/ L2
2.4	Thermal runaway and stability,	T-1	334	337	Black board	01		CO2/ L2
2.5	Transistor as an amplifier, CE amplifier response,	T - 1	259	260	Black board	01		CO3/ L2
2.6	Transistor at low frequencies, CE amplifier response, gain bandwidth product	T - 1	398	400	Black board	02		CO3/ L2
2.7	Emitter follower	T-1,	419	422	Black board	01		CO3/ L2
2.8	RC coupled amplifier	T - 1, R - 1			Black board	01		CO3/ L2
2.9	Two cascaded CE	T - 1, R - 1	398	401	Black board	01		CO3/ L2
2.10	Multi stage CE amplifiers	T-1,R-1			Black board	01		CO3/ L2
2.11	Tutorial							
Unit/Item No.	Topic (s)	Book Reference	Page (s)		Teaching Methodology	Proposed No. of Periods	Actual Date of Handled	CO/RBT
			From	To				
3.1	FETS, JFET	T-1	462	466	Black board	02		CO2/ L2
3.2	CS and CD amplifiers.	T-1,R - 1	475	480	Black board	02		CO2/ L2
3.3	V-I characteristics,	T - 1,R-1	467	469	Black board	01		CO2/ L2
3.4	MOSFET	R - 1	472	475	Black board	01		CO2/ L2
3.5	Low frequency CS and CD amplifiers,	T - 1,R-1			Black board	01		CO2/ L2
3.6	Digital (binary) operations of a system	T - 2,R-2			Black board	01		CO4/ L2
3.7	OR gate, AND gate, NOT, EXCLUSIVE OR gate,	T - 2,R-2	135	143	Black board	01		CO4/ L2
3.8	De Morgan Laws, NAND and NOR DTL gates,	T-2,R-2	162,563	163,565	Black board	01		CO4/ L2
3.9	Modified DTL gates,	T-2,R- 2	564	565	black board	01		CO6/ L2
3.10	HTL and TTL gates, output stages,	T - 2	568	572	black board	01		CO6/ L2
3.11	RTL and DCTL, CMOS, Comparison of logic families.	T - 2	562,585	563,586	black board	01		CO6/ L2
	Tutorial							
	Review	Signature of the HOD/Coordinator						



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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-III								
4.1	Basic Theorems and Properties of Boolean Algebra	T – 2	155	166	black board	01		CO4/ L2
4.2	Canonical and Standard Forms, Product-of-Sums Simplification	T-2,R – 2	231	236	black board	01		CO4/ L2
4.3	Digital Logic Gates	T-2	136	143	black board	01		CO4/ L2
4.4	The Map Method	T-2	231	250	black board	02		CO4/ L2
4.5	Don't-Care Conditions,	T-2	259	264	black board	01		CO4/ L2
4.6	NAND and NOR Implementation, Exclusive-OR Function	T-2 R – 2	137	140	Black board	01		CO4/ L2
4.7	Binary Adder-Subtractor	T-2 R – 2	337	338	Black board	01		CO5/ L2
4.8	Decimal Adder, Binary Multiplier	R – 2,T-2		346	Black board	01		CO5/ L2
4.9	Magnitude Comparator	R – 2,T-2	372	374	Black board	01		CO5/ L2
4.10	Decoders, Encoders	T – 2,R-2	372	383	Black board	02		CO5/ L2
4.11	Multiplexers	T – 2, R-2	389	391	Black board	02		CO5/ L2
	Tutorial							
	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								
V								
5.1	Sequential Circuits	T – 2,R-2	550	553	Black board	01		CO5/ L2
5.2	Storage Elements	T – 2,R-2	553	558	Black board	01		CO5/ L2
5.3	Latches and flip flops	T-2,R – 2	553	558	Black board	03		CO5/ L2
5.4	Analysis of Clocked Sequential Circuits	R – 2	611	631	Black board	01		CO5/ L2

	SRI INDU COLLEGE OF ENGG & TECH (Regulation :R20) Department of Computer Science and Engineering(CS)		Prepared on:28.9.2021 Rev1:
	Sub. Code & Title	(R20ECE2106) Analog and Digital Electronics	
	Academic Year: 2021-22	Year/Sem./Section	II-I
	Faculty Name & Designation	SHAIK AZEERA BEGUM Assistant Professor	

LIST OF TEXT BOOKS AND REFERENCES

TEXT BOOKS:

- T1: Integrated Electronics: Analog and Digital Circuits and Systems, 2/e, Jaccob Millman, Christos Halkias and Chethan D. Parikh, *Tata McGraw-Hill Education*, India, 2010.
 T2: Digital Design, 5/e, Morris Mano and Michael D. Cilette, *Pearson*, 2011.

REFERENCE BOOKS:

- R1: Electronic Devices and Circuits, Jimmy J Cathey, *Schaum's outline series*, 1988.
 R2: Digital Principles, 3/e, Roger L. Tokheim, *Schaum's outline series*, 1994.

WEB LINKS

- W1. <https://nptel.ac.in/courses/106108099//Digital%20Systems.pdf>
 W2. <https://nptel.ac.in/courses/108102095>
 W3. <https://nptel.ac.in/courses/108102095>
 W4. <https://nptel.ac.in/courses/117106086>
 W5. <http://www.kpsec.freeuk.com/symbol.htm>
 W6. http://buildinggadgets.com/index_circuitlinks.html
 W7. <http://www.guidecircuit.com>
 W8. www.mathsisfun.com/binary-number-system.html
 W9. www.allaboutcircuits.com
 W10. www.electronics-tutorials.ws



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CONTENT BEYOND THE SYLLABUS

S.No	Topics	Proposed Actions	Date	Resource Person/Mode	POs	PSOs
1.	Semiconductor devices	Online		Dr.G.sureshgeorge/ppt	PO1, PO6	PSO1,PSO2
2.	Diode current equation	Class room		K.Rammohan/ppt	PO1,PO6	PSO1,PSO2
3.	FET characteristics and FET biasing	Online		P.udaya sri/ppt	PO1, PO6	PSO1,PSO2
4.	Sum of product(SOP) form	Nptel		V.sunitha/quiz	PO2,PO3	PSO1,PSO2
5.	State table	Nptel		Hemavathi/ppt	PO2	PSO1,PSO2

ASSIGNMENT QUESTIONS

S.NO	Assignment Questions	Course Outcome	Books To be Referred	DateOf Announcement	Date Of Submission
1.	Explain Diffusion and Drift current for a semiconductor	CO1	T1,R1	10.12.21	12.12.21
2.	Derive the expression for the transition capacitance of a reverse biased P-N junction diode	CO1	T1,R1	10.12.21	12.12.21
3.	a) Draw and explain the circuit diagram of Full wave rectifier with c-filter	CO2	T1	10.12.21	12.12.21
4.	Explain any two Bias compensation techniques	CO2	T1, R1	10.12.21	12.12.21
5.	Compare the performances of BJT as an amplifier in CE,CC,CB Configuration	CO2	R1	10.12.21	12.12.21
6.	Draw the characteristics and explain the operation of enhancement and depletion mode	CO2	T1, R1	10.2.22	12.2.22
7	Design a Full Adder circuit using NAND gate	CO4	T2,R2	10.2.22	12.2.22
8	Prove the De Morgan's theorem	CO4	T2	10.2.22	12.2.22
9	Explain the various steps in the analysis of synchronous sequential circuit with suitable example	CO5	T2,R2	10.2.22	12.2.22
10	a) Draw the circuit of 2-bit comparator and give its truth table. b) Explain the working RAM and give applications of RAM	CO4,CO6	T2,R2	10.2.22	12.2.22



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Faculty Name & Designation	SHAIK AZEERA BEGUM Assistant Professor		

SELF STUDY TOPICS

S.No.	Topics	Books & Journals	Course Outcomes
1	V-I Characteristics	Integrated Electronics: Analog and Digital Circuits and Systems, 2/e, Jaccob Millman, Christos Halkias and Chethan D. Parikh, <i>Tata McGraw-Hill Education</i> , India,2010.	CO1
2	OPARATING POINT	Integrated Electronics: Analog and Digital Circuits and Systems, 2/e, Jaccob Millman,Christos Halkias and Chethan D. Parikh, <i>Tata McGraw-Hill Education</i> , India, 2010	CO2
3	DIGITAL LOGICGATES	Digital Design, 5/e, Morris Mano and Michael D. Cilette, <i>Pearson</i> , 2011.	CO4
4	BINARY ADDER - SUBTRACTOR	Digital Design, 5/e, Morris Mano and Michael D. Cilette, <i>Pearson</i> , 2011.	CO4



**SRI INDU COLLEGE OF ENGG & TECH
QUESTION BANK**

(Regulation :R20)

Department of Computer Science Engineering(CS)

(Regulation :R20)
Prepared on : 28.9.2021
Rev1:

Sub. Code & Title (R20ECE2106) Analog and Digital Electronics

Academic Year: 2021-22

Year/Sem. II/I

Faculty Name & Designation

SHAIK AZEERA BEGUM Assistant Professor

QUESTION BANK WITH BLOOMS TAXONOMY LEVEL (BTL)

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

UNIT-1 : DIODES AND APPLICATIONS

1 MARKS QUESTIONS

		BT Level	Course Outcome
1.	What is energy band diagram? Draw the energy band diagram of semiconductor?	2	CO1
2.	Explain the operation of diode as a switch?	2	CO1
3.	Explain the reverse bias of a p-n operation and its characteristics?	2	CO1
4.	Draw Tunnel Diode Characteristics?	2	CO1
5.	Draw the Diode Equivalent Circuit. Mention the applications of PN-junction diode?	2	CO1
6.	Explain the term knee voltage and Breakdown voltage with respect to diodes?	2	CO1
7.	Explain the operation of half wave rectifier?	2	CO1
8.	Explain the operation of full wave rectifier?	2	CO1
9.	Short notes on clippers.	1	CO1
10.	Short notes on comparators.	1	CO1

10 MARKS QUESTIONS

1.	Draw the forward and reverse characteristics of a PN junction diode and explain them qualitatively?	2	CO1
2.	Derive the Expression for the transition capacitance of a reverse biased p-n junction diode V.	2	CO1
3.	Obtain the expression for ripple factor in the case of Full wave rectifier circuit without filter?	2	CO1
4.	What is the difference between Tunnel diode and photo diode? Explain their operations and applications?	2	CO1
5.	Draw and Explain the V-I characteristics of Zener Diode? Discuss the breakdown mechanism?	2	CO1
6.	Obtain the expression for ripple factor in the case of Half wave rectifier circuit with filter?	2	CO1
7.	Discuss the effect of temperature on diode with neat sketch?	1	CO1
8.	What is a clipper? With the help of circuit diagram and waveform describe the operation of positive and negative clippers?	2	CO1
9.	An AC supply of 220V is applied to a half wave rectifier circuit through a transformer with a turns ratio of 10:1 .Find i) DC output voltage ii) PIV .Assume the diode to an ideal one.	2	CO1
10.	Derive the expression for Diffusion Capacitance?	2	CO1



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QUESTION BANK
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Faculty Name & Designation	SHAIK AZEERA BEGUM Assistant Professor		

Unit -II : BJTS TRANSISTOR CHARACTERISTICS

1 MARKS QUESTIONS		BT Level	Course Outcome
1.	What is operating point or Q point?	2	CO2
2.	Comparison of transistors configuration?	2	CO2
3.	Explain self bias with neat diagram?	2	CO2
4.	Explain the operation of NPN transistors with neat sketch?	2	CO2
5.	Explain the thermal runaway?	2	CO2
6.	What is the gain bandwidth product?	2	CO2
7.	What is Need Filter in Power Supply?	2	CO2
8.	What is h-parameters for a Transistor?	1	CO2
9.	Why CC is named as Emitter follower?	1	CO2
10.	If the Transistor has $\alpha=0.98$, Find the value of β and if $\beta=200$, Find α ?	2	CO2
10 MARKS QUESTIONS			
1.	Explain the input and output characteristics of a transistor in CB configuration?	1	CO2
2.	Draw the self bias circuit and obtained the expression for the stability factor.What are the advantages of this circuit?	1	CO2
3.	Explain the thermal runaway and thermal stability in briefly?	3	CO2
4.	a) Derive the Relation among α , β and γ ? b) Determine I_C , I_E and α for a Transistor Circuit having $I_B=15\mu A$ and $\beta=150$?	3	CO2
5.	a) Explain any two bias compensation techniques. b) What is thermal runaway? Explain how it can be avoided?	2	CO2
6.	Draw the circuit diagram of a CE amplifier and explain its working.	1	CO3
7.	Explain the two stage of RC coupled amplifier?	2	CO3
8.	Draw the Emitter Follower circuit and explain briefly?	2	CO3
9.	How does emitter bypass capacitor CE determines a lower 3db frequency?	3	CO3
10.	Draw the h-parameter equivalent circuits for transistors amplifier in the three configurations?	1	CO3



**SRI INDU COLLEGE OF ENGG & TECH
QUESTION BANK**

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Department of Computer Science Engineering(CS)

(Regulation :R20)

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28.9.2021:

Sub. Code & Title

(R20ECE2106) Analog and Digital Electronics

Academic Year: 2021-22

Year/Sem.

II/I

Faculty Name & Designation

SHAIK AZEERA BEGUM Assistant Professor

Unit -III : FETS AND DIGITAL CIRCUITS

1 MARKS QUESTIONS

		BT Level	Course Outcome
1.	Explain the working principle of n-MOSFET?	1	CO2
2.	Write the applications of JFET?	2	CO2
3.	List the important features of FET and explain why FET is an unipolar device?	2	CO2
4.	A JFET has a pinch off voltage of 4volts and saturation current of 9 mA. Calculate the drain current if $V_{GS} = -2$ Volt. ?	1	CO2
5.	What are the differences between BJT and JFET?	1	CO2
6.	List the properties of Ex-OR gate?	1	CO4
7.	State and prove Demorgan's theorems?	1	CO4
8.	Comparison of logic families?	1	CO6
9.	Explain the operation of Nand gate with TTL?	1	CO4
10.	Explain the operation of Nor gate with DTL?	3	CO4

10 MARKS QUESTIONS

1.	Derive the expression for the pinch of voltage V_P in the case of n-channel JFET?	2	CO2
2.	Draw the circuit diagram and explain the Drain and Gate characteristics of JFET?	4	CO2
3.	Compare the JFET and MOSFET devices in all respects and write the applications of JFET and MOSFET devices?	2	CO2
4.	Explain the Common Source Amplifier ?	2	CO3
5.	An n-channel JFET has $I_{DSS}=10mA$ and $V_P=-2V$ determine the drain source resistance $r_{ds(pri)}$ $V_{GS}=0V$, ii) $V_{GS}=-0.5$.	1	CO3
6.	A) State and prove Demorgan's theorems B) State and prove consensus theorem?	2	CO4
7.	Draw the symbol and truth tables for the following i) AND GATE ii) OR GATE iii) NOT GATE iv) EX-OR GATE	5	CO4
8.	Draw the circuit of a CMOS two input NAND gate	5	CO6
9.	Explain the totem circuit of TTL logic family?	2	CO6
10.	Draw the circuit of TTL NAND gate and explain its operation?	2	CO6



SRI INDU COLLEGE OF ENGG & TECH
QUESTION BANK
 (Regulation :R20)
 Department of Computer Science Engineering(CS)

(Regulation :R20)
 Prepared on :
 Rev1:

Sub. Code & Title	R20ECE2106) Analog and Digital Electronics		
Academic Year: 2021-22	Year/Sem.	II/I	
Faculty Name & Designation	SHAIK AZEERA BEGUM Assistant Professor		

Unit-IV :COMBINATIONAL LOGIC CIRCUITS

1 MARKS QUESTIONS

		BT Level	Course Outcome
1.	Draw the Boolean expression for K-map $f(A, B, C) = \sum (0, 2, 5)$	2	CO4
2.	What are min terms and max terms in Boolean algebra	1	CO4
3.	List the applications of multiplexer.	2	CO5
4.	Draw the truth table of Half Subtractor?	1	CO5
5.	Design the AND gate using NOR gate?	1	CO4
6.	What is meant by pair and quads?	1	CO4
7.	Draw the truth table of Half Adder ?	1	CO5
8.	Explain 1-bit comparator?	1	CO5
9.	Design 4 to 1 mux using two 2 to 1 mux?	2	CO5
10.	What is Encoder?	2	CO5

10 MARKS QUESTIONS

1.	(A) Simplify the logic function: $f(A,B,C,D) = AB+AC+C+AD+ABC+ABC$ (B) Determine the canonical SOP representation of the function: $f(x,y,z) = z+(x'+y)(x+y')$	3	CO4
2.	simplify the following function using K-map, $F(A,B,C,D)=\sum m(1, 3, 4, 5, 6, 9, 11, 12, 14, 15)$?	6	CO4
3.	Define combinational circuit? Build the full adder using two half adders and logicgates with truth table?	4	CO5
4.	simplify the following function using K-map with don't cares $F(A,B,C,D)=\sum m(0,1,,2,3,5,,6,8,10)+d(4,7,9,13)$	2	CO4
5.	A) Justify with your answer Why are NAND and NOR gates known as universal gates.B)Design EX-OR gate and EX-NOR using NAND and NOR gates?	4	CO4
6.	A) Prove the expression: $xy+x'+yz = x'z+xy$ B) Minimize the following Boolean expressions. $B'C'D+(B+C+D)'+B'C'D'E$ $A'B'C'+A'BC'+AB'C'+ABC'$	4	CO4
7.	What is comparator? Design & implement a 2-bit comparator using logic gates?	2	CO5
8.	Construct the following functions using Multiplexer $F1 = m(2, 3, 6, 8, 12)$ $F2 = m(1, 3, 5, 6, 7, 8, 10)$	2	CO5
9.	What is Encoder? Build Octal to Binary Encoder?	4	CO5
10.	Design a full adder circuit using 3:8 Decoder?	2	CO5



**SRI INDU COLLEGE OF ENGG & TECH
QUESTION BANK**

(Regulation :R20)

Department of Computer Science Engineering(CS)

(Regulation :R20)

Prepared on : 28.9.2021

Sub. Code & Title

R20ECE2106) Analog and Digital Electronics

Academic Year: 2021-22

Year/Sem.

II/I

Faculty Name & Designation

SHAIK AZEERA BEGUM Assistant Professor

Unit-V SEQUENTIAL LOGIC CIRCUITS

1 MARKS QUESTIONS

		BT Level	Course Outcome
1.	Differentiate between synchronous and asynchronous circuits?	2	CO5
2.	Distinguish between latch and flip flop?	2	CO5
3.	Explain the register and types of register?	1	CO5
4.	Short notes on state reduction?	1	CO5
5.	Compare ROM and RAM?	2	CO5
6.	Design of 2-bit synchronous counter?	1	CO5
7.	What are the differences between counter and shift register?	1	CO5
8.	Explain D flipflop ?	1	CO5
9.	Designing steps to analysis of sequential circuits.	2	CO5
10.	Explain a short notes ROM.	1	CO5

10 MARKS QUESTIONS

1.	A) Build the logic diagram of a SR flip-flop using NAND gates. B) Design the logic diagram of a JK flip-flop using NAND gates.	2	CO5
2.	A) What is the difference between state table and state transition table? B) Differentiate between combinational & sequential circuit	2	CO5
3.	Draw the diagrams and explain the working of the following types of shift register A)Serial-in, serial-out (B)Serial-in, parallel-out	4	CO5
4.	Construct a 4 bit Ripple counter.	2	CO5
5.	A) Design Mod-6 synchronous counter using JKFF? B) Write the design steps of synchronous counters?	2	CO5
6.	What is RAM .Explain the different types of RAM in detail.	2	CO5
7.	Define ROM. Explain the different types of ROM.	2	CO5
8.	Explain the different methods of State Assignment.	4	CO5
9.	What are the steps in the analysis of asynchronous sequential circuit .explain with an example?	2	CO5
10.	Explain in detail of Races.	2	CO5

BR-20

Subject Code: R20ECE2106

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 –End Examinations (Regular)

ANALOG AND DIGITAL ELECTRONICS

(Common to CS,IOT)

Duration: 3 Hrs

Max Marks: 70M

Section – A

Answer All the following questions

Marks: 5x4 = 20M

1. What is energy band diagram? Draw the energy band diagram of semiconductor?
2. Why CC is named as Emitter follower
3. Write the applications of JFET?
4. What are min terms and max terms in Boolean algebra?
5. Differentiate between synchronous and asynchronous circuits?

Section – B

Answer any FIVE questions choosing at least one from each Unit

Marks: 5x10 = 50M

UNIT - I

6. Obtain the expression for ripple factor in the case of Full wave rectifier circuit without filter
(OR)

7. Explain the avalanche diode and its breakdown mechanism.

UNIT - II

8. A) Derive the Relation among α , β and γ ?
B) Determine I_C , I_E and α for a Transistor Circuit having $I_B=15\mu A$ and $\beta=150$?
(OR)

9. Draw the self bias circuit and obtained the expression for the stability factor. what are the advantages of this circuit ?

UNIT - III

10. Draw the circuit diagram and explain the Drain and Gate characteristics of JFET?

(OR)

11. Compare the JFET and MOSFET devices in all respects and write the applications of JFET and MOS FET devices?

UNIT - IV

12. Define combinational circuit? Build the full adder using two half adders and logic gates with Truth table?

(OR)

13. A) Prove the expression: $xy+x'yz = x'z+xy$.
B) Minimize the following Boolean expressions. $B'C'D+(B+C+D)'+B'C'D'E$, $A'B'C'+A'BC'+AB'C'+ABC'$.

UNIT – V

14. Draw the diagrams and explain the working of the following types of shift register
A) Serial-in, serial-out (B) Serial-in, parallel-out.

(OR)

15. Construct a 4 bit Ripple counter.
- 16.

MID I EXAM MODEL PAPER

BR-20

SRI INDU COLLEGE OF ENGINEERING & TECHNOLOGY

I

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

II B.Tech - I Semester - I Mid Term Examinations

(R20ECE2106) ANALOG AND DIGITAL ELECTRONICS - (Common to CS,IOT)

Duration: 90Mins

Date: FN

Max Marks: 2

Section – A

Answer All the questions

Marks: 5Qx1M = 5M

1. What is energy band diagram? Draw the energy band diagram of semiconductor.?
2. Explain the reverse bias of a p-n operation and its characteristics?
3. What is operating point or Q point.?
4. Draw the arrangement for self-bias technique.
5. List the important features of FET and explain why FET is an unipolar device?

Section – B

Answer any FOUR questions

Marks: 4Qx5M = 20

6. Derive the Expression for the transition capacitance of a reverse biased p-n junction diode?
7. Draw and Explain the V-I characteristics of Zener Diode? Discuss the breakdown mechanism?
8. Distinguish between the different types of transistor configurations with necessary circuit diagrams.
9. Explain the two stage of RC coupled amplifier.
10. Give the construction details of JFET and explain its operation.
11. Explain the operation of FET with its characteristics and explain the different regions in transfer characteristics.

BR-20

SRI INDU COLLEGE OF ENGINEERING & TECHNOLOGY

I

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

II B.Tech - I Semester - II Mid Term Examinations

(R20ECE2106) ANALOG AND DIGITAL ELECTRONICS - (Common to CS,IOT)

Duration: 90Mins

Date: FN

Max Marks: 25M

Section – A

Answer All the questions

Marks: 5Qx1M = 5M

1. State and prove Demorgan's theorems?
2. Draw the Boolean expression for K-map $f(A, B, C) = \sum (0, 2, 5)$?
3. Draw the truth table of Half Sub tractor?
4. Differentiate between synchronous and asynchronous circuits?
5. Explain a short notes ROM?

Section – B

Answer any FOUR questions

Marks: 4Qx5M = 20M

6. Draw the circuit of TTL NAND gate and explain its operation?
7. Draw the circuit of a CMOS two input NAND gate?
8. Simplify the following function using K-map,
 $F(A,B,C,D) = \sum m(1, 3, 4, 5, 6, 9, 11, 12, 14, 15)$?
9. Design a full adder circuit using 3:8 Decoder?
10. Construct a 4 bit Ripple counter
11. Define ROM. Explain the different types of ROM.

DATA STRUCTURES

SRI INDU COLLEGE OF ENGINEERING & TECHNOLOGY

(An Autonomous Institution under UGC, New Delhi)

B.Tech. - II Year – I Semester

L	T	P	C
3	1	0	4

(R20CSE2101) Data Structures

Prerequisites: A course on “Programming for Problem Solving”.

Course Objectives:

- Exploring basic data structures such as stacks and queues.
- Introduces a variety of data structures such as hash tables, search trees, tries, heaps, graphs.
- Introduces sorting and pattern matching algorithms.

Course Outcomes:

- Ability to select the data structures that efficiently model the information in a problem.
- Ability to assess efficiency trade-offs among different data structure implementations or combinations.
- Implement and know the application of algorithms for sorting and pattern matching.
- Design programs using a variety of data structures, including hash tables, binary and general tree structures, search trees, tries, heaps, graphs, and AVL-trees.

UNIT - I

Introduction to Data Structures, abstract data types, Linear list – singly linked list implementation, insertion, deletion and searching operations on linear list, Stacks-Operations, array and linked representations of stacks, stack applications, Queues-operations, array and linked representations.

UNIT - II

Dictionaries: linear list representation, skip list representation, operations - insertion, deletion and searching.

Hash Table Representation: hash functions, collision resolution-separate chaining, open addressing-linear probing, quadratic probing, double hashing, rehashing, extendible hashing.

UNIT - III

Search Trees: Binary Search Trees, Definition, Implementation, Operations- Searching, Insertion and Deletion, AVL Trees, Definition, Height of an AVL Tree, Operations – Insertion, Deletion and Searching, Red –Black, Splay Trees.

UNIT - IV

Graphs: Graph Implementation Methods. Graph Traversal Methods.

Sorting: Heap Sort, External Sorting- Model for external sorting, Merge Sort.

UNIT - V

Pattern Matching and Tries: Pattern matching algorithms-Brute force, the Boyer –Moore algorithm, the Knuth-Morris-Pratt algorithm, Standard Tries, Compressed Tries, Suffix tries.

TEXT BOOKS:

1. Fundamentals of Data Structures in C, 2nd Edition, E. Horowitz, S. Sahni and Susan Anderson Freed, Universities Press.
2. Data Structures using C – A. S. Tanenbaum, Y. Langsam, and M.J. Augenstein, PHI/Pearson Education.

REFERENCE BOOK:

1. Data Structures: A Pseudocode Approach with C, 2nd Edition, R. F. Gilberg and B.A. Forouzan, Cengage Learning.



SRI INDU COLLEGE OF ENGG & TECH

LESSON PLAN

(Regulation :R20)

Department of Computer Science and Engineering(CS)

Prepared on:7.10.21
Rev1:

Sub. Code & Title

R20CSE2101 Data Structures

Academic Year: 2021-22

Year/Sem./Section

II-I

Faculty Name & Designation

A.SRUTHI Asst.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	Introduction					18		
1.1	Introduction to Data Structures	R1	3	8	Black board	03		CO1, L1
1.2	Abstract data types	R1	9	15	Black board	01		CO1, L1
1.3	Linear list – singly linked list implementation	R1	193	194	PowerPoint Presentation	02		CO1, ,L2
1.4	Insertion, deletion and searching operations on linear list	R1	195	212	Black board	01		CO1, L2
1.5	Stacks-Operations, stack applications	R1	80	81	MODEL	02		CO1,L2
1.6	Array and linked representations of stacks	R1	83	89	Black board	01		CO1, L1
1.7	Queues-operations	R1	148	150	Black board	01		CO1, L2
1.8	Queues using array	R1	150	150	Black board	01		C01,L2
1.9	Queues using Linked list	R1	151	158	Black board	O2		CO1,L1
	Review	Signature of the HOD/Coordinator						
UNIT -II								
II	Dictionaries					14		
2.1	Dictionaries: linear list representation	T1	395	395	Black board	01		CO2, L1
2.2	skip list representation	T1			Black board	01		CO 2, L1
2.3	operations - insertion, deletion and searching	T1			Power point Presentation	01		CO 2, L2
2.3	Hash Table Representation: hash functions	R1	397	398	Power point Presentation	01		CO 2, L2
2.4	collision resolution-separate chaining	R1	620	621	Black board	02		CO2, L2
2.5	open addressing-linear probing	R1	623	624	Black board	02		CO 2, L3
2.6	quadratic probing, , double hashing	R1	625	625	Black board	01		CO2, L3
2.7	Rehashing, extendible hashing	R1			Black board	01		CO 2, L2
	Review	Signature of the HOD/Coordinator						



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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	
UNIT- III									
III	Search Trees					11			
3.1	Search Trees: Binary Search Trees, Definition	T1	226	226	Seminar	02		CO4,L3	
3.2	Implementation, Operations- Searching, Insertion	T1	227	228	Black board	01		CO3, L4	
3.3	Deletion of elements	T1	230	231	Black board	01		CO3,L3	
3.4	AVL Trees, Definition, Height of an AVL Tree	R1	341	342	Power point Presentation	01		CO3, L4	
3.5	Operations – Insertion, Deletion and Searching,	R1	348	348	Black board	01		CO4, L4	
3.6	Deletion and Searching,	R1	349	351	Black board	01		CO4, L3	
3.7	Red –Black	T1	518	525	Black board	01		CO4, L3	
3.8	Splay Trees	T1	542	542	Black board	01		CO4, L3	
	Review	Signature of the HOD/Coordinator							
UNIT- IV									
IV	Graphs					16			
4.1	Graphs: Graph Implementation	T1	257	263	Black board	01		CO4, L2	
4.2	Graph Traversal Methods	T1	272	273	Black board	02		CO4, L2	
4.3	Sorting: Heap Sort	T1	347	347	Black board	02		CO3, L4	
4.4	External Sorting	T1	372	372	Black board	01		CO3, L4	
4.5	Model for external sorting	T1	376	376	Power point Presentation	02		CO3, L2	
4.6	Merge Sort	T1	335	335	Black board	01		CO3, L4	
	Review	Signature of the HOD/Coordinator							
UNIT- V									
V	Pattern Matching and tries					16			
5.1	Pattern Matching and Tries	T1	557	561	Black board	01		CO6,L3	
5.2	the Boyer –Moore algorithm	W6	-	-	Power point Presentation	01		CO6, L4	
5.3	the Knuth-Morris-Pratt algorithm	W7	-	-	Power point Presentation	02		CO6, L4	
5.4	Standard Tries	W8	-	-	Black board	01		CO6, L6	
5.5	Compressed Tries	W8	-	-	Black board	01		CO6, L6	
5.6	Suffix tries	W8	-	-	Black board	01		CO6, L6	
	Review	Signature of the HOD/Coordinator							

	SRI INDU COLLEGE OF ENGG & TECH LESSON PLAN (Regulation :R20) Department of Computer Science and Engineering(CS)		Prepared on:7.10.21 Rev1:
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	Academic Year: 2021-22	Year/Sem./Section	II-I
	Faculty Name & Designation	A.SRUTHI Asst.professor	

LIST OF TEXT BOOKS AND REFERENCES

TEXT BOOKS:


- T1. Fundamentals of Data Structures in C, 2nd Edition, E. Horowitz, S. Sahni and Susan Anderson Freed, Universities Press.
- T2. Data Structures using C – A. S. Tanenbaum, Y. Langsam, and M.J. Augenstein, PHI/Pearson Education.

REFERENCE BOOK:

- R1. Data Structures: A Pseudocode Approach with C, 2nd Edition, R. F. Gilberg and B.A. Forouzan, Cengage.

WEB LINKS

- W1. <https://nptel.ac.in/noc/courses/noc18/SEM1/noc18-cs25/>
- W2. <https://nptel.ac.in/courses/106/105/106105085/>
- W3. <https://nptel.ac.in/courses/106/105/106105085/>
- W4. <https://www.coursera.org/specializations/data-structures-algorithms>
- W5. <https://www.edx.org/course/data-structures-fundamentals>
- W6 <https://www.geeksforgeeks.org/boyer-moore-algorithm-for-pattern-searching/>
- W7 <https://www.geeksforgeeks.org/kmp-algorithm-for-pattern-searching/>
- W8 <https://www.geeksforgeeks.org/types-of-tries/>

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	Faculty Name & Designation	A.SRUTHI Asst.professor		

CONTENT BEYOND THE SYLLABUS

S.No	Topics	Proposed Actions	Date	Resource Person/Mode	POs	PSOs
1	Binary Tree , Terminology and B+ Tree	NPTEL		G.Uma Maheswari /PPT	PO1,PO4	PSO1
2	Array implementation using list	NPTEL		M.Swathi /PPT	PO1	PSO1

ASSIGNMENT I & II

S.No.	Assignment Questions	Course Outcome	Books To be Referred	Date Of Announcement	Date Of Submission
I.	Explain the following data structures operations? a) Stack operations b) Queue operations	CO1	T2	11.12.21	13.12.21
2.	Describe Linked list? Distinguish between array and linked list?	CO1	T2	11.12.21	13.12.21
3.	Discuss the term Dictionary? What are the various applications of Dictionary and Hashing?	CO2	T2	11.12.21	13.12.21
4.	What are the various types of hash functions?	CO2	T1	11.12.21	13.12.21
5.	Write a procedure to perform insertion deletion and searching in Binary search tree?	CO4	T1	11.12.21	13.12.21
6.	a)Develop a program to insert the elements into AVL tree? b) Construction of AVL tree step by step with diagrams for the list {25, 30, 35, 40, 50, 55, 60, 65, 70, 75}	CO4	T2	10.02.22	12.2.22
7.	Explain Breadth first search traversal with example?	CO3	T2	10.02.22	12.2.22
8.	Discuss about merge sort technique with suitable example?	CO3	T2	10.02.22	12.2.22



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S.No.	Assignment Questions	Course Outcome	Books To be Referred	Date Of Announcement	Date Of Submission
9.	Write and explain Boyer Moore pattern matching algorithm?	CO6	T2	10.02.22	12.2.22
10.	Calculate the failure function (or) prefix table in a search string "ABACAABADCABACABAA BB".	CO6	T2	10.02.22	12.2.22

SELF STUDY TOPICS

S.No.	Topics	Books & Journals	Course Outcomes
1	Quick sort	Data structures through c by "yashvantkanetkar"	CO1,CO3
2	Circular queue	Data structures through c by "yashvantkanetkar"	CO1,CO2



SRI INDU COLLEGE OF ENGG & TECH
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Faculty Name & Designation	A.SRUTHI Asst.professor		

QUESTION BANK WITH BLOOMS TAXONOMY LEVEL (BTL)

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

UNIT I				
PART A				
1 MARK QUESTIONS			BT LEVEL	COURSE OUTCOME
1	Define a data structure? Mar 2018		1	CO1
2.	Define Linear data structure? Dec 2016		1	CO1
3.	Describe Non Linear data structure?		2	CO1
4.	Write about abstract data type? Nov 2018		3	CO1
5.	Define Stack? DEC 2012		1	CO1
6.	Describe Queue? Oct 2018		2	CO1
7.	Describe Linked list? Nov 2019		2	CO1
8	Explain the advantages and disadvantages of linked list ?		2	CO1,CO2
9	What are the advantages and disadvantages of arrays? Oct 2016		1	CO1
10	Explain the applications of Linked list? DEC 2017		2	CO1
PART B				
10 MARKS QUESTIONS				
1	Discuss about implementation of single linked list.? Oct 2019		2	CO1
2	Write a program to implement single linked list? Dec 2016		6	CO1,CO2
3	Explain the following data structures a)stack operations b)Queue operations		2	CO1
4	Write about Stack representation using array and linked list? July 2021 Nov 2019		3	CO1,CO2
5	Write about Queue representation using array and linked list? Mar 2021		3	CO1,CO2
6	Write a program to implement stack using Linked list?		6	CO1,CO2
7	Write a program to implement Queue using array? Oct 2020		6	CO1,CO2
8	Explain about Stack applications and Queue applications.		2	CO1,CO2
9	Describe Linked list? Distinguish between array and linked list? Mar 2018		4	CO1
10	Explain about following a) Data structure b) Abstract Data Type c) Linear data structure d) Non Linear Data structure		2	CO1



**SRI INDU COLLEGE OF ENGG & TECH
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R20CSE2101 Data Structures

Academic Year: 2021-22

Year/Sem./Section

II-I

Faculty Name & Designation

A.SRUTHI Asst.professor

UNIT II

PART A

1 MARK QUESTIONS

		BT LEVEL	COURSE OUTCOME
1	Describe Dictionary? Mar 2020	1	CO1,CO2
2.	What is Hash Function? DEC 2016	1	CO2
3.	Write about Linear Probing and Quadratic Probing? Dec 2016	3	CO2
4.	Define collision?	3	CO1,CO2
5.	Describe skip list? Nov 2019	2	CO1,CO2
6.	List the collision resolution techniques? OCT 2020	1	CO1,CO2
7.	Define chaining?	1	CO2
8	Define double hashing? Dec 2017	1	CO2
9	What is the use of rehashing technique?	3	CO2
10	What is the use extensible hashing?	3	CO2

PART B

10 MARKS QUESTIONS

1	What are the two methods of representing Liner list? Explain with example DEC 2012	1	CO2
2	Write about Hash table and Hash function? DEC 2016	3	CO2
3	What are the various types of hash functions?	1	CO2
4	Demonstrate skip list representation and its node structure with example? Oct 2021 Nov 2019	3	CO2
5	Explain a)How does collision occur? Mar 2021 Oct 2020 b) Explain chaining and open addressing methods for detecting collision and overflow?	2	CO1,CO2
6	Write about following collision handling techniques? a) Quadratic Probing b) Double hashing Mar 2021	3	CO2
7	Discuss about the Rehashing Technique and its advantages?	2	CO2
8	Explain the concept of extensible hashing with suitable example	2	CO2
9	What is hashing? Explain the differentiation between hashing and skip list? DEC 2013	2	CO2
10	Discuss the term Dictionary? What are the various applications of Dictionary and Hashing?	3	CO1,CO2



**SRI INDU COLLEGE OF ENGG & TECH
QUESTIONBANK**

(Regulation :R20)

Department of Computer Science and Engineering(CS)

(Regulation :R20)

Prepared on:7.10.21

Rev1:

Sub. Code & Title

R20CSE2101 Data Structures

Academic Year: 2021-22

Year/Sem./Section

II-I

Faculty Name & Designation

A.SRUTHI Asst.professor

UNIT III

PART A

1 MARK QUESTIONS

		BT LEVEL	COURSE OUTCOME
1	Define a Binary Search tree? How do we represent it? July 2021	1	CO1,CO3
2.	List the operations in Binary Search Tree? Mar 2021	1	CO3
3.	What is an AVL Tree? Give one example? Nov 2019	1	CO3
4.	Write short notes on Balance factor in AVL tree?	3	CO3
5.	Differentiate AVL tree and Binary search tree? DEC 2015	4	CO1,CO3
6.	What are the applications of AVL tree?	1	CO3
7.	List the rotations in AVL tree?	1	CO3
8	Write the disadvantages of Binary search tree?	3	CO3
9	List the rules of Red-Black Tree? Dec 2016	1	CO1,CO3
10	What is Splay tree? OCT 2020	1	CO1,CO3

PART B

10 MARKS QUESTIONS

1	Write a procedure to perform insertion deletion and searching in Binary search tree? Dec 2017,Dec 2016	6	CO2,CO3
2	Explain in detail deletion of an element in BST in different cases?	2	CO1,CO4
3	Write a program to perform following operations in Binary search tree? a) Insert an element into a binary search tree b) Delete an element from a binary search tree OCT 2020	6	CO1,CO4
4	Define Binary search tree? Construct binary search tree step by step with diagrams using list of numbers {4,5,1,2,9,7,3,6,10,12,11}. July 2021	6	CO1,CO4
5	Describe AVL Tree? Illustrate different rotations in AVL tree for balancing with appropriate example? Nov 2019	4	CO4
6	Write list of operations perform on AVL tree with example? Mar 2021	3	CO4
7	a) Explain a balance factor in AVL tree with example? b) Explain representation of AVL tree with example?	2	CO4
8	a) Develop a program to insert the elements into AVL tree? b) Construction of AVL tree step by step with diagrams for the list {25, 30, 35, 40, 50, 55, 60, 65, 70, 75}. DEC 2011 DEC 2018	6	CO4
9	Illustrate Red-Black tree with example?	4	CO1,CO4
10	Illustrate Splay-tree with example? Oct 2021	4	CO1,CO4



SRI INDU COLLEGE OF ENGG & TECH
QUESTIONBANK

(Regulation :R20)

Department of Computer Science and Engineering(CS)

(Regulation :R20)

Prepared on:7.10.21

Rev1:

Sub. Code & Title

R20CSE2101 Data Structures

Academic Year: 2021-22

Year/Sem./Section

II-I

Faculty Name & Designation

A.SRUTHI Asst.professor

UNIT IV

PART A

1 MARK QUESTIONS

		BT LEVEL	COURSE OUTCOME
1	Define a graph? DEC 2015	1	CO5,CO4
2.	Write short notes on directed graph? Mar 2021	3	CO4
3.	Write short notes on undirected graph? DEC 2016	3	CO4
4.	What the graph traversing techniques?	1	CO1,CO5
5.	Define complete graph and weighted graph? July 2021	1	CO4
6.	Describe heap sort ?	2	CO4
7.	Describe external sorting? OCT 2020	2	CO4
8	What is merge sort?	1	CO4
9	What is in-degree and out-degree of graph? July 2017	1	CO4
10	Compare BFS and DFS?	4	CO5,CO4

PART B

10 MARKS QUESTIONS

1	Write about various graph representation techniques? Dec 2017, July2021	3	CO4
2	Classify the types of graphs? Explain basic terminologies in graph?	2	CO4
3	Explain Breadth first search traversal with example? Mar 2021	2	CO5,CO4
4	Explain Depth first search traversal with example? Mar 2021	2	CO5,CO4
5	Write a program to implement breadth first search?	6	CO5,CO3
6	Write a program to implement depth first search?	6	CO5,CO4
7	Explain about heap sort with example? DEC 2015, July 2021, Mar 2021, Oct 21	2	CO3
8	Explain external sorting model for external sorting? Oct 2020	2	CO3
9	Discuss about merge sort technique with suitable example? Nov 2019	2	CO3
10	a) Distinguish between heap sort and merge sort? b) What are applications of heap sort and merge sort?	4	CO3



**SRI INDU COLLEGE OF ENGG & TECH
QUESTIONBANK**

(Regulation :R20)

Department of Computer Science and Engineering(CS)

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Rev1:

Sub. Code & Title

R20CSE2101 Data Structures

Academic Year: 2021-22

Year/Sem./Section

II-I

Faculty Name & Designation

A.SRUTHI Asst.professor

UNIT V

PART A

1 MARK QUESTIONS

		BT LEVEL	COURSE OUTCOME
1	Define Trie? Mar 2019	1	CO1,CO6
2.	What are the different types of Pattern Matching Algorithms?	1	CO6
3.	Define String and Alphabet? DEC 2015	1	CO6
4.	Describe Prefix and Suffix with example.? Oct 2020	2	CO6
5.	What is Substring? Write down the substrings of the String "DATASTRUCTURES". DEC 2017	1	CO6
6.	What is the average-case and worst-case running time of KMP algorithm?	1	CO6
7.	What is the running time of Brute-force algorithm? DEC 2016	1	CO6
8	What are the applications of pattern matching?	1	CO1,CO6
9	Write about CompressedTrie?	3	CO6
10	Write about Suffix Trie? OCT 2020	3	CO6

PART B

10 MARKS QUESTIONS

1	Discuss about various types of tries.	2	CO1
2	Write and explain Boyer Moore pattern matching algorithm? Nov 2019	6	CO6
3	Write and explain Knuth-Morris-pratt pattern matching algorithm? OCT 2020 Mar 2021 Nov 2019	6	CO1,CO6
4	What are the advantages of trie? Compare trie with Hash table?	4	CO6
5	Explain about the compressed triewith an example. Mar 2020	2	CO6
6	Calculate the failure function (or) prefix table in a search string "ABACAABADCABACABAABB". DEC 2016	6	CO6
7	Differentiate standard tries and compressed tries?	4	CO6
8	Explain the Brute-force algorithm with an example OCT 2020	2	CO1,CO6
9	Explain about the Suffix tries with an example. Nov 2018	2	CO6
10	Draw the Standard Trie and Compressed Trie for the following String {area, array, aim, acid, act, rest, rate, ratio} Dec 2018	6	CO6

PREVIOUS YEAR QUESTION PAPER

BR-18

HallTicket No.: _____

D4

Subject Code: R18CSE2101

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 - November - 2019

DATA STRUCTURES

(Common to CSE, IT)

Duration: 3 Hrs

06.11.2019

Max Marks: 70M

Section - A

Answer All the following questions
20M

Marks: 5Qx4M =

1. Evaluate the following postfix expression $632-*+1\$7+$.
2. Compare AVL tree and Red black tree.
3. Write the pseudocode to find the height of AVL tree.
4. Describe external sorting with example.
5. Write the standard trie for the set of strings $S = \{ \text{bear, bell, bid, bull, buy, sell, stock, stop} \}$.

Section - B

Answer any FIVE questions choosing at least one from each Unit

Marks: 5Qx10M =

50M

UNIT : I

6. Write a C program to implement stack using linked list representation.
- (OR)
7. Write a c Program to convert given infix expression to postfix form using stack.

UNIT : II

8. Explain Searching an element in Skip list with an example and also write Pseudo code for the same.

(OR)

9. Explain with an suitable example of Extendible Hashing.

UNIT : III

10. Write a C program to construct binary search tree from the given data 4,6,8,2,5,1,7,3.

(OR)

11. Describe AVL Tree? Illustrate different rotations in AVL tree for balancing with appropriate example.

UNIT : IV

12. Construct a binary search tree from the given data 7,5,3,6,2,1,8,4,9 and perform in-order, pre-order and post-order traversal.

(OR)

13. Explain the working of merge sort with pseudocode. Sort the given elements 5,3,9,1,2,8,4,6 using merge sort technique.

UNIT : V

14. Explain working of Boyer Moore Algorithm with an suitable example.

(OR)

15. Explain Knuth-Morris-pratt pattern matching algorithm with an example.

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 –End Examinations (Suppl.) October-2020**R18CSE2101 – DATA STRUCTURES**

(Common to CSE & IT)

Duration:2 Hrs**14.10.2020 (FN)****Max Marks:70M****Section – A****Answer Any Three of the following questions.****Marks: 3Qx6M =18M**

1. Write the postfix form of given infix expression $a^b+(c*d-e+(f/g+h)/i)^j/k^l$.
2. Discuss splay trees with an example.
3. List the different methods for collision resolution
4. Explain external sorting with example.
5. Mention the applications of suffix trie.

Section – B**Answer FOUR questions from the following****Marks: 4Qx13M = 52M****UNIT – I**

6. Write a C program to implement basic operation of queue using linked list representation .

(OR)

7. Write a C Program to evaluate given postfix expression using stack .

UNIT - II

8. Explain deleting an element in Skip list representation .Also write Pseudo code for the same

(OR)

9. Explain the separate chaining in detail. Use the hash function 'key mod 7', to insert the following sequence of keys in the hash table 50, 700, 76, 85, 92, 73,101.Use separate chaining technique for collision resolution.

UNIT - III

10. Explain in detail deletion of an element in BST in different cases.

(OR)

11. Illustrate red black trees with an example . Mention its advantages. Compare it with AVL trees

UNIT - IV

12. Construct a binary search tree from the given data 8,9,3,6,2,1,7,4,5 and perform in-order ,pre-order and post -order traversal .

(OR)

13. Explain the working of heap sort .Sort the given elements 5,3,9,1,2,8,4,7,6 using heap sort technique

UNIT-V

14. Explain the Brute-force pattern matching algorithm with an example.

(OR)

15. Explain Knuth-Morris-pratt pattern matching algorithm with an example.



SRI INDU COLLEGE OF ENGINEERING & TECHNOLOGY

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1956

II B.Tech I Semester (Reg./Suppl.) End Examinations March - 2021

DATA STRUCTURES

10 /03/2021

(Common to CSE and IT)

Day- 2

Duration: 3 Hrs

Marks: 5Qx14M =

70M

Answer **FIVE** questions (Treat Q.No.11 as a single question).

UNIT-I

1. Write a program in C to create two queues using linked list and identify which queue is having more number of elements and search a given element is present in both queues.

(OR)

2. Given an array arr[] of n elements, write a function to search a given element x in arr[].

Input : arr[] = {10, 20, 80, 30, 60, 50, 110, 100, 130, 170}

X=130

Output : ?

Implement the above concepts using C Program.

UNIT-II

3. Using the hash function 'key mod 7', insert the following sequence of keys in the hash table-

50, 700, 76, 85, 92, 73 and 101

Use separate chaining technique for collision resolution.

(OR)

4. Assuming the table size as the smallest prime number greater than the input size, hash the

following keys: [52, 66, 35, 04, 68, 34, 26, 19, 29]. To handle collision, use

a) Linear probing and

b) Quadratic probing. Which of the two methods has less number of total Probes?

UNIT-III

5. Write a procedure (no code required) to delete a node from a AVL tree with suitable examples and neat figures.

(OR)

6. a) Construct a Binary Search Tree for the following order of input (step by step construction is

expected) [40, 29, 12, 34, 78, 54, 90, 57, 77, 44, 23, 11, 8, 19] [7].

b) Traverse the above BST through Inorder, Postorder and Preorder.

UNIT-IV

7. With Example explain the following:

a) Breadth first Traversal.

b) Depth first Traversal.

(OR)

8. Sort the following data using (MAX) heapsort: [20, 12, 35, 15, 10, 80, 30] and illustrate with appropriate figures for each iteration.

UNIT-V

9. How to build a Suffix Tree for a given text? Also explain how to search a pattern in the built suffix tree.

"AndroidOS\0".

(OR)

10. Explain how Knuth Morris Pratt string Search Algorithm are performed with the example String pattern.

P.T.O.

11. Answer any **THREE** questions from the following.

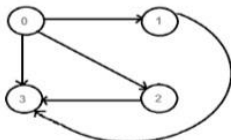
(5M+5M+4M)

a) Write down the algorithm for inserting the value at the beginning of the queue?

b) What do you mean by collision resolution in hashing technique?

c) Mention how Zig-Zig and Zag-Zag rotations are performed in the splay tree.

d) Find the number of paths of length K in a directed graph for the following.



- e) Define how brute force approach is used to search the value. Specify its best and worst case time complexities.

BR-18
D4

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, August - 2019
(R18CSE2101) DATA STRUCTURES - (Common to CSE & IT)

Duration: 90Mins
25M

Dt: 26.08.2019 AN

Max Marks:

Section – A

Answer All the questions

Marks:

5Qx1M = 5M

1. Explain the advantages and disadvantages of linked list.
2. Explain the applications of Linked list.
3. Define double hashing?
4. Define collision.
5. List the operations in Binary Search Tree.

Section – B

Answer any FOUR questions

Marks:

4Qx5M = 20M

6. Discuss about implementation of single linked list.
7. Explain the following data structures operations a) Stack operations b) Queue operations.
8. Write about Queue representation using array and linked list.
9. What are the two methods of representing Linear list? Explain with example.
10. Write about Hash table and Hash function.
11. Write a procedure to perform insertion deletion and searching in Binary search tree.

BR-18
D4

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 - II Mid Term Examinations
(R18CSE2101) DATA STRUCTURES - (Common to CSE & IT)

Duration: 90Mins
25M

Dt: 30.10.2019 AN

Max Marks:

Section – A

Answer All the questions

Marks:

5Qx1M = 5M

1. List the rules of Red-Black Tree?
2. Define complete graph and weighted graph.
3. Describe external sorting.
4. What are the different types of Pattern Matching Algorithms?
5. What are the applications of pattern matching?

Section – B

Answer any FOUR questions

Marks:

4Qx5M = 20M

6. Illustrate Red-Black tree with example?
7. Illustrate Splay-tree with example.
8. Explain Depth first search traversal with example.
9. Discuss about merge sort technique with suitable example.
10. Explain about the compressed trie with an example.
11. Explain the Brute-force algorithm with an example.

MATHEMATICAL AND STATISTICAL FOUNDATION

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

B.Tech. - II Year – I Semester

L	T	P	C
3	1	0	4

(R20MTH2104) Mathematical and Statistical Foundations

Prerequisites: Mathematics courses of first year of study.

Course Objectives:

1. The Number Theory basic concepts useful for cryptography etc
2. The theory of Probability, and probability distributions of single and multiple random variables
3. The sampling theory and testing of hypothesis and making inferences
4. Stochastic process and Markov chains.

Course Outcomes: After learning the contents of this course, the student must be able to

5. Apply the number theory concepts to cryptography domain
6. Apply the concepts of probability and distributions to some case studies
7. Correlate the material of one unit to the material in other units
8. Resolve the potential misconceptions and hazards in each topic of study.

UNIT - I

Greatest Common Divisors and Prime Factorization: Greatest common divisors, The Euclidean algorithm, The fundamental theorem of arithmetic, Factorization of integers and the Fermat numbers

Congruences: Introduction to congruences, Linear congruences, The Chinese remainder theorem, Systems of linear congruences

UNIT - II

Simple Linear Regression and Correlation: Introduction to Linear Regression, The Simple Linear Regression Model, Least Squares and the Fitted Model, Properties of the Least Squares Estimators, Inferences Concerning the Regression Coefficients, Prediction, Simple Linear Regression Case Study Random Variables and Probability Distributions: Concept of a Random Variable, Discrete Probability Distributions, Continuous Probability Distributions, Statistical Independence.

Discrete Probability Distributions: Binomial Distribution, Poisson distribution.

UNIT - III

Continuous Probability Distributions: Normal Distribution, Areas under the Normal Curve, Applications of the Normal Distribution, Normal Approximation to the Binomial

Fundamental Sampling Distributions: Random Sampling, Sampling Distributions, Sampling Distribution of Means and the Central Limit Theorem, Sampling Distribution of S^2 , t-Distribution, F- Distribution.

UNIT - IV

Estimation & Tests of Hypotheses: Introduction, Statistical Inference, Classical Methods of Estimation. Estimating the Mean, Standard Error of a Point Estimate, Prediction Intervals, Tolerance Limits, Estimating the Variance, Estimating a Proportion for single mean , Difference between Two Means, between Two Proportions for Two Samples and Maximum

COMPUTER SCIENCE & ENGINEERING (CYBER SECURITY)

Likelihood Estimation.

UNIT - V

Stochastic Processes and Markov Chains: Introduction to Stochastic processes- Markov process. Transition Probability, Transition Probability Matrix, First order and Higher order Markov process, nstep transition probabilities, Markov chain, Steady state condition, Markov analysis.

TEXT BOOKS:

1. Kenneth H. Rosen, Elementary number theory & its applications, sixth edition, Addison- Wesley, ISBN 978 0-321-50031-1
2. Ronald E. Walpole, Raymond H. Myers, Sharon L. Myers, Keying Ye, Probability & Statistics for Engineers & Scientists, 9th Ed. Pearson Publishers.
3. S C Gupta and V K Kapoor, Fundamentals of Mathematical statistics, Khanna publications
4. T.T. Soong, Fundamentals of Probability And Statistics For Engineers, John Wiley & Sons Ltd, 2004.

REFERENCE BOOK:

1. Sheldon M Ross, Probability and statistics for Engineers and scientists, Academic Press.



SRI INDU COLLEGE OF ENGG & TECH

LESSON PLAN

(Regulation :R20)

Department of Computer Science and Engineering(CS)

Prepared on:29.9.21

Rev1:

Sub. Code & Title (R20MTH2104) Mathematical and Statistical Foundations

Academic Year: 2021-22 **Year/Sem./Section** **II-I**

Faculty Name & Designation M.LEELA , ASST.PROFESSOR

Unit/ Item No.	Topic (s)	Book Reference	Page (s)		Teaching Methodology	Proposed No. of Periods	Actual Date of Handled	CO/RBT
			Fro m	To				
UNIT – I								
I	Greatest Common Divisors and Prime Factorization:					11		
1.1	Greatest common divisors	T1	53	55	Black board	01		CO-1,L5
1.2	The Euclidean algorithm	T1	55	59	Black board	01		CO-1,L3
1.3	The fundamental theorem of arithmetic	T1	60	62	Black board	01		CO-1,L3
1.5	Factorization of integers	T1	65	70	Black board	01		CO-1, L5
1.6	The Fermat numbers	T1	82	85	Black board	01		CO-1,L1
1.7	Introduction to congruences	T1	91	96	Black board	01		CO-1,L2
1.8	Linear congruences	T1	97	101	Black board	01		CO-1,L1
1.9	The Chinese remainder theorem,	T1	102	103	Presentation	01		CO-1,L4
1.10	Systems of linear congruences	W1			Presentation	01		CO1,L3
1.11	Problems on congruence	W2			Presentation	01		CO1,L5
	Review	Signature of the HOD/Coordinator						
Unit/ Item No.		Book Reference	Page (s)		Teaching Methodology	Proposed No. of Periods	Actual Date of Handled	CO/RBT
UNIT-II								
II	Simple Linear Regression and Correlation					15		
2.1	Introduction to Linear Regression	T2	357	357	Black board	01		CO2,L2
2.2	The Simple Linear Regression Model	T2	358	358	Black board	01		CO2,L1
2.3	Least Squares and the Fitted Model	T2	358	359	Black board	01		CO2,L5
2.4	Properties of the Least Squares Estimators	T2	360	361	Demonstration	01		CO2,L4
2.5	Inferences Concerning the Regression Coefficients	T2	362	367	Black board	01		CO2,L1
2.6	Random Variables	T3	1	3	Black board	01		CO2,L1
2.7	Probability Distributions	T3	10	15	Demonstration	01		CO2,L2
2.8	Concept of a Random Variable	T3	16	22	Black board	01		CO2,L2
2.9	Discrete Probability Distributions	T3	24	26	Black board	01		CO2,L5
2.10	Problems on discrete probability distributions	T3	28	35	Black board	01		CO2,L5
2.11	Continuous Probability Distributions	T3	36	37	Black board	01		CO2,L4



SRI INDU COLLEGE OF ENGG & TECH

LESSON PLAN

(Regulation :R20)

Department of Computer Science and Engineering(CS)

Prepared on:29.9.21
Rev1:

Sub. Code & Title (R20MTH2104) **Mathematical and Statistical Foundations**

Academic Year: 2021-22 **Year/Sem./Section** **II-I**

Faculty Name & Designation **M.LEELA , ASST.PROFESSOR**

Unit/ Item No.	Topic (s)	Book Reference	Page (s)		Teaching Methodology	Proposed No. of Periods	Actual Date of Handled	CO/RBT	
			From	To					
2.12	Problems on Continuous Probability Distributions	T3	38	50	Black board	01		CO2,L5	
2.13	Statistical Independence	T1	36	36	Black board	01		CO2,L1	
2.14	Binomial Distribution	T3	121	140	Black board	01		CO2,L1	
2.15	Poisson distribution.	T3	141	165	Black board	01		CO2,L1	
	Review	Signature of the HOD/Coordinator							
UNIT-III									
III	Continuous Probability Distributions:					11			
3.1	Normal Distribution,	T3	166	167	Presentation	01		CO3,L2	
3.2	Areas under the Normal Curve	T3	168	168	Presentation	01		CO3,L3	
3.3	Applications of the Normal Distribution,	W4	170	174	Black board	01		CO3,L3	
3.4	Problems on the Normal Distribution,	T1	50	65	Black board	01		CO3,L5	
3.5	Normal Approximation to the Binomial	T1	65	75	Black board	01		CO3,L4	
3.6	Fundamental Sampling Distributions	T1	89	90	Black board	01		CO4,L4	
3.7	Random Sampling,	T1	91	95	Black board	01		CO4,L2	
3.8	Sampling Distribution of Means and the Central Limit Theorem	T1	100	126	Black board	01		CO4,L5	
3.9	Sampling Distribution of chi-square test	T2	4.5	4.25	Black board	01		CO4,L3	
3.10	Sampling Distribution of t- test	T2	4.26	4.30	Black board	01		CO4,L4	
3.11	Sampling Distribution of f-test	T2	4.45	4.50	Black board	01		CO4,L3	
	Review	Signature of the HOD/Coordinator							
UNIT-IV									
IV	Estimation & Tests of Hypotheses:					11			
4.1	Introduction Estimation & Tests of Hypotheses:	T1	250	251	Presentation	01		CO5,L3	
4.2	Classical Methods of Estimation.	T1	253	253	Presentation	01		CO5,L4	
4.3	Estimating the Mean	T	254	255	Black board	01		CO5,L1	
4.4	Standard Error of a Point Estimate	T1	260	269	Black board	01		CO5,L4	
4.5	Prediction Intervals,	R1	4.61	4.72	Presentation	01		CO5,L5	
4.7	Estimating the Variance,	R1	4.73	4.80	Presentation	01		CO5,L5	
4.8	Estimating a Proportion for single mean	T1	280	290	Black board	01		CO5,L4	
4.9	Estimating Difference between Two Means	T1	300	304	Black board	01		CO5,L4	

4.10	Estimating Difference between Two proportion	T3	5.4	5.14	Black board	01		CO5,L4	
4.11	Maximum Likelihood Estimation.	T3	5.24	5.40	Black board	01		CO5,L1	
		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 –V									
V	Stochastic Processes and Markov Chains					08			
5.1	Introduction to Stochastic processes- Markov process	R1	8.1	8.2	Black board	01		CO6,L1	
5.2	Transition Probability	R1	8.2	8.7	Black board	01		CO6,L2	
5.3	Transition Probability Matrix,	R1	8.7	8.36	Black board	01		CO6,L5	
5.4	First order and Higher order Markov process	R1	8.2	8.36	Black board	01		CO6,L4	
5.5	n-step transition probabilities	R1	8.25	8.27	Black board	01		CO6,L4	
5.6	Markov chain,	R1	8.01	8.22	Black board	01		CO6,L3	
5.7	Steady state condition,	R1	8.31	8.38	Black board	01		CO6,L1	
5.8	Markov analysis	R1	8.39	8.46	Black board	01		CO6,L4	
	Review	Signature of the HOD/Coordinator							

LIST OF TEXT BOOKS AND REFERENCES

TEXT BOOKS:

T1: Kenneth H. Rosen, Elementary number theory & its applications, sixth edition, Addison- Wesley, ISBN 9780-321-50031-1

T2: Ronald E. Walpole, Raymond H. Myers, Sharon L. Myers, Keying Ye, Probability & Statistics for Engineers & Scientists, 9th Ed. Pearson Publishers.

T3: S C Gupta and V K Kapoor, Fundamentals of Mathematical statistics, Khanna publications

T4: T.T. Soong, Fundamentals of Probability And Statistics For Engineers, John Wiley & Sons Ltd, 2004

REFERENCE BOOK:

R1: Sheldon M Ross, Probability and statistics for Engineers and scientists, Academic Press.

WEB LINKS

W1 https://www.efunda.com/math/math_home/math.cfm

W2 <https://www.ocw.mit.edu/resources/#Mathematics>


W3 <https://www.sosmath.com/>

W4 <https://www.mathworld.wolfram.com/>

W5 <https://www.mathworld.wolfram.com/>

W6 <https://onlinecourses.nptel.ac.in/>

W7 <https://www.e-booksdirectory.com/details.php?ebook=10166>

	SRI INDU COLLEGE OF ENGG & TECH LESSON PLAN (Regulation :R20) Department of Computer Science and Engineering(CS)			Prepared on:29.9.21 Rev1:	
	Sub. Code & Title		(R20MTH2104) Mathematical and Statistical Foundations		
	Academic Year: 2021-22		Year/Sem./Section	II-I	
	Faculty Name & Designation		M.LEELA , ASST.PROFESSOR		

CONTENT BEYOND THE SYLLABUS

S. No	Topics	Proposed Actions	Date	Resource Person/Mode	POs	PSOs
1	Bernoulli's and exponential distributions	To get knowledge		Mrs. Leela/PPT	PO1	PSO1,PSO2
2	Classification of samples	To get knowledge		Mrs. Leela/PPT	PO1	PSO1,PSO2

ASSIGNMENT I & II

S.No.	Assignment Questions	Course Outcome	Books To be Referred	Date of Announcement	Date of submission
1	How many incongruent solutions does each of the following systems of congruences have i) $2x + y + z \equiv 1 \pmod{5}$ ii) $x + 2y + z \equiv 1 \pmod{5}$ iii) $x + y + 2z \equiv 1 \pmod{5}$	CO1	T1	11.12.21	13.12.21
2.	If c and d are integers and $c = dq + r$ then $(c, d) = (d, r)$.	CO1	T1	11.12.21	13.12.21
3.	In the following table S is weight of potassium bromide which will dissolve in 100 grms. of water V^0 c. Estimate α and β for the linear regression curve $\mu_{Y/X} = \alpha + \beta x$ ii) find the point estimate of $\mu_{Y/30}$	CO2	T1	11.12.21	13.12.21
4.	Box A contains 5 red and 3 white marbles and box B contains 2 red and 6 white marbles. If a marble is drawn from each box, what is the probability that they are both of same color?	CO2	T1	11.12.21	13.12.21
5.	In a Normal distribution 7% of the items are under 35 and 89% are under 63. Determine the mean and variance of the distribution.	CO3	T1	11.12.21	13.12.21
6.	In a sample of 1000 cases, the mean of a certain test is 14 and standard deviation is 2.5, Assuming the distribution to be normal, find a. How many students score between 12 and 15? b. How many score above 18 c. How many score below 18	CO3	T1	10.02.22	12.2.22
7.	Consider all the samples of size 2 are taken from population 3,6,9,15,27 with replacement. Then find I. The populations mean. II. The population standard deviation. III. The mean of the sampling distribution of means. IV. The standard deviation of the sampling distribution of means.	CO4	T1	10.02.22	12.2.22
8.	A random sample of 100 teachers in a large metropolitan area revealed a mean weekly salary of Rs,487 with a standard deviation Rs.48. With what degree of confidence can we assert that the average weekly salary of all teachers in the metropolitan area is between 472 to 502 ?	CO5	T1	10.02.22	12.2.22
9.	Explain the procedure of testing of hypothesis.	CO5	T1	10.02.22	12.2.22



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LESSON PLAN

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10.	<p>The transition probability matrix (t p m) of a markov chain $\{ X_n \}$ 1,2,3,..... having three states 1,2, and 3 is P</p> $= \begin{pmatrix} 0.3 & 0.7 & 0 \\ 0.1 & 0.4 & 0.5 \\ 0 & 0.2 & 0.8 \end{pmatrix}$ <p>And the initial distribution is, $P^0 = [0.7, 0.2, 0.1]$</p> <p>Find (i) $P\{ X_2=3 \}$ (ii) $P\{ X_3=2 , X_2=3 , X_1=3 , X_0=2 \}$</p>	CO6	T1	10.02.22	12.2.22
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SELF STUDY TOPICS

S.No.	Topics	Books & Journals	Course Outcomes
1	LEAST COMMON MULTIPLE, Prime	Elementary Number theory& its Applications, sixth edition, by Kenneth H Rosen	CO1
2	Introduction on probability	Probability and Statistics by Sheldon M Ross	CO2
3	Binomial distribution	Probability and Statistics by Sheldon Ross	C02



SRI INDU COLLEGE OF ENGG & TECH
QUESTION BANK

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QUESTION BANK WITH BLOOMS TAXONOMY LEVEL (BTL)

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

UNIT I				
PART A				
1 MARK QUESTIONS			BT LEVEL	COURSE OUTCOME
1	Define Greatest Common Divisor.		1	CO1
2.	Find the greatest common factor of 15 and 35.		5	CO1
3.	Find the greatest common divisor for the set of integers 5, 25, 75.		5	CO1
4.	State Fundamental Theorem of Arithmetic.		1	CO1
5.	Find the prime factorization of 515.		5	CO1
6.	Express in terms of divisibility $a \equiv b \pmod{m}$.		2	CO1
7.	Find the least nonnegative residue modulo 13 of -100 .		5	CO1
8	Find an inverse modulo 17 of 5.		5	CO1
9	State Chinese Remainder Theorem.		1	CO1
10	Find an inverse modulo 5 for the matrix $\begin{bmatrix} 2 & 2 \\ 1 & 2 \end{bmatrix}$		5	CO1
PART B				
10 MARKS QUESTIONS				
1	Show that the greatest common divisor of the integers a and b that are not both zero, is the least positive integer that is a linear combination of a and b.		4	CO1
2	State and Prove Fundamental Theorem of Arithmetic.		1	CO1
3	If c and d are integers and $c = dq + r$ then $(c, d) = (d, r)$.		3	CO1
4	Show that if p is a prime and a is an integer with $p \mid a^2$, then $p \mid a$.		4	CO1
5	Show that all the powers in the prime-factor factorization of an integer n are even if and if n is a perfect square		4	CO1
6	Prove that the relation “Congruence mod m” is an equivalence relation.		2	CO1
7	Solve the linear congruence of a) $17x \equiv 14 \pmod{21}$ b) $128x \equiv 833 \pmod{1001}$		3	CO1



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8	Solve the following system of congruences $x \equiv 2 \pmod{9}$ $x \equiv 8 \pmod{15}$ $x \equiv 10 \pmod{25}$.	3	CO1
9	Find the solutions of the following systems of linear congruences $2x + 3y \equiv 5 \pmod{7}$ $x + 5y \equiv 6 \pmod{7}$	5	CO1
10	How many incongruent solutions does each of the following systems of congruences have $2x + y + z \equiv 1 \pmod{5}$ $x + 2y + z \equiv 1 \pmod{5}$ $x + y + 2z \equiv 1 \pmod{5}$	5	CO1

UNIT II

PART A

1 MARK QUESTIONS

		BT LEVEL	COURSE OUTCOME
1.	What is the formula for An unbiased estimate of s^2 ?	1	CO2
2.	Write any two properties of least squares estimators.	2	CO2
3.	what are the normal equations for straight line ?	1	CO2
4.	Define the probability.	1	CO2
5.	what are the axioms of probability ?	2	CO2
6.	Find the probability of getting a sum of 10 if we throw two dies.	5	CO2
7.	What is the probability that a card is drawn at random from the pack of cards may be either king or queen.?(P&S BR-16,March 2021)	5	CO2
8.	Write the mean, variance and standard deviation of a discrete probability distribution.	5	CO2
9.	Define Binomial distribution and mean of binomial distribution.	1	CO2
10.	Write the recurrence relation of Poisson distribution.	1	CO2
11.	A fair coin is tossed until a head or five tails occurs. Find the expected number of tosses of the coin. (BR18-october-2020)	5	CO2

PART B

10 MARKS QUESTIONS

1	From a sample of 200 pairs of observation the following quantities were calculated $\sum X=11.34, \sum Y=20.78, \sum X^2=12.16, \sum Y^2=84.96, \sum XY=22.13$ from the above data compute the regression coefficients of the equation $Y = \alpha + \beta X$	5	CO2																				
2.	The grade of class of 9 students on a midterm report (x) and on the final examination(y) are as follows <table border="1" style="margin-left: 20px;"> <tr> <td>X</td> <td>77</td> <td>50</td> <td>71</td> <td>72</td> <td>81</td> <td>94</td> <td>96</td> <td>99</td> <td>67</td> </tr> <tr> <td>Y</td> <td>82</td> <td>66</td> <td>78</td> <td>34</td> <td>47</td> <td>85</td> <td>99</td> <td>99</td> <td>68</td> </tr> </table> i) estimate the linear regression line ii) estimate the final examination grade of a student who received a grade of 85 on the midterm report	X	77	50	71	72	81	94	96	99	67	Y	82	66	78	34	47	85	99	99	68	5	CO2
X	77	50	71	72	81	94	96	99	67														
Y	82	66	78	34	47	85	99	99	68														



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3.	In the following table S is weight of potassium bromide which will dissolve in 100 grms. of water V^0 c. Estimate α and β for the linear regression curve $\mu_{Y/X} = \alpha + \beta x$ ii) find the point estimate of $\mu_{Y/30}$	5	CO2																		
4.	Box A contains 5 red and 3 white marbles and box B contains 2 red and 6 white marbles. If a marble is drawn from each box, what is the probability that they are both of same color?	1	CO2																		
5.	In a bolt factory machines A, B, C manufacture 29% , 30% and 50% of the total of their output and 6%,3% and 2% are defective. A bolt is drawn at random and found to be	1	CO2																		
6.	A random variable X has the following probability function : <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>$X = x$</td> <td>0</td> <td>1</td> <td>2</td> <td>3</td> <td>4</td> <td>5</td> <td>6</td> <td>7</td> </tr> <tr> <td>$P(X = x)$</td> <td>0</td> <td>K</td> <td>K</td> <td>K</td> <td>K</td> <td>K^2</td> <td>$2K^2$</td> <td>$7K^2 + K$</td> </tr> </table> <p>(i) Determine the value of K (ii) Evaluate $P(X < 6)$, $P(X \geq 6)$ and $P(0 < x < 5)$ If $P(X \leq K) > \frac{1}{2}$, find the minimum value of K. (BR18-october-2020)</p>	$X = x$	0	1	2	3	4	5	6	7	$P(X = x)$	0	K	K	K	K	K^2	$2K^2$	$7K^2 + K$	5	CO2
$X = x$	0	1	2	3	4	5	6	7													
$P(X = x)$	0	K	K	K	K	K^2	$2K^2$	$7K^2 + K$													
7.	If the probability density of a random variable is given by $f(x) = K(1 - x^2)$; $0 < x < 1$ and $f(x) = 0$ otherwise Find the value of 'K' and the probabilities that a random variable will take on a value i) between 0.1 and 0.2 ii) greater than 0.5	5	CO2																		
8	The mean and variance of a binomial variable X with parameters n and p are 16 and 8. Then find $P(X \geq 1)$ and $P(X > 2)$.	5	CO2																		
9	If X is Poisson variate such that, $3P(x=4) = 0.5 P(x=2) + P(x=0)$ then find the men of X and $P(x \leq 2)$.	1	CO2																		
10	If 2% of light bulbs are defective, Find (i) At least one is defective (ii) Exactly 7 are defective (iii) $P(1 < x < 8)$ in a sample of 100.	5	CO2																		
11	A,B,C are aiming to shoot a balloon. A will succeed 4 times out of 5 attempts. The chance of B to shoot the balloon is 3 out of 4 and that of C is 2 out of 3. If the three aim the balloon simultaneously, then find the probability that at least two of them hit the balloon. Two digits are selected at random from the digits 1 through 9. i) If the sum is odd, what is probability that 2 is one of the numbers selected? ii) If 2 is one of the digits selected, what is the probability that the sum is odd? (BR-18,sept 2021)																				

UNIT III

PART A

1 MARK QUESTIONS

		BT LEVEL	COURSE OUTCOME
1.	Define normal distribution.	1	CO3
2.	Write any three characteristics of the normal distribution?	1	CO3
3	What is the standard error of the statistic sample mean?	1	CO3
4.	Find the equation of normal distribution if the $\mu=5$ S.D=2.	5	CO3
5	The marks of 5 students in one subject are 45,47,49,61,48 and mean of the population is 52.then t value ?	5	CO3
6.	What is sampling.?	1	CO4



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7	If 36 size of sample mean and standard deviation are 157, 15 and population mean is 155 then z is?	5	CO4
8.	What the central limit theorem.	1	CO4
9.	How many different samples of size two can be chosen, from a finite population of size 25?	2	CO4
10.	What is finite population correction factor if $n=5$ and $N=200$.	1	CO4
11.	A population consists of five numbers 2,3,6,8 and 11. Consider all possible samples of size which can be drawn without replacement from this population. Find the standard deviation of sampling distribution of means.(BR-16-December-2018)	4	CO3

PART B

10 MARKS QUESTIONS

1	Give the Applications of normal distribution.	2	CO3
2.	In a Normal distribution 7% of the items are under 35 and 89% are under 63. Determine the mean and variance of the distribution.	1	CO3
3.	The marks obtained in mathematics by 1000 students is normally distributed with mean 78% and standard deviation 11%.Determine (i) How many students got marks above 90% (ii) What is the highest mark obtained by the lowest 10 % of the students Within what limits did the middle of 90 % of the students lie. (BR-18,October-2020)		
4.	In a sample of 1000 cases, the mean of a certain test is 14 and standard deviation is 2.5, Assuming the distribution to be normal, find a) How many students score between 12 and 15? b) How many score above 18 c) How many score below 18	1	CO3
5	If X is a normal variate, find the area A I. to the left of $z = -1.78$ II. to the right of $z = -1.45$ III. Corresponding to $-0.8 \leq z \leq 1.53$ IV. to the left of $z = -2.52$ and to the right of $z = 1.83$	1	CO3
6.	A random sample of size 100 is taken from an infinite population having the mean $\mu=76$ and variance 256. What is the probability that x will be between 75 and 78.	1	CO3
7	A population consists of six numbers 4,8,12,16,20,24. Consider all samples of size two which can be drawn without replacement from this population. Find a. The populations mean. b. The population standard deviation. c. The mean of the sampling distribution of means. d. The standard deviation of the sampling distribution of means. (BR-18,October-2020)	1	CO4
8.	Find the probability that out of 100 patients between 84 and 95 inclusive will survive a heart-operation given that the chances of survival is 0.9.	5	CO4
9.	Explain briefly chi- square distribution.	2	CO4
10.	Explain briefly t-distribution.	2	CO4
11.	Explain briefly F – distribution.	2	CO4

UNIT IV

PART A

1 MARK QUESTIONS

		BT LEVEL	COURSE OUTCOME
1.	Define an unbiased estimator.	1	CO5
2.	Define point estimation and interval estimation.	1	CO5
3.	What is the formula for sample size for estimating population mean?	1	CO5
4.	What is the formula to calculate maximum error of estimate E?	1	CO5
5.	What is the formula for Bayesian interval for μ	1	CO5
6.	Define maximum likelihood estimation function.	1	CO5
7.	Write the test statistic for single mean.	5	CO5
8.	Write the test statistic for difference of two means.	5	CO5
9.	Write the test statistic for single proportion.	5	CO5
10.	Write the test statistic for difference of two proportions.	5	CO5

PART B

10 MARKS QUESTIONS

1.	<p>. To compare two kinds of bumper guards, 6 of each kind were mounted on a car and then the car was run into a concrete well. The following are the costs of repair.</p> <table border="1" style="margin-left: 20px;"> <tr> <td>Guard I</td> <td>107</td> <td>148</td> <td>123</td> <td>165</td> <td>102</td> <td>119</td> </tr> <tr> <td>Guard II</td> <td>134</td> <td>115</td> <td>112</td> <td>151</td> <td>133</td> <td>129</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table> <p>Use 0.01 level of significance to test whether the difference between two sample means (BR-18,March-2021)</p>	Guard I	107	148	123	165	102	119	Guard II	134	115	112	151	133	129								5	CO5
Guard I	107	148	123	165	102	119																		
Guard II	134	115	112	151	133	129																		
2.	What is the size of the smallest sample required to estimate an unknown proportion to within a maximum error of 0.06 with at least 95% confidence.	2	CO5																					
3.	Find 95% confidence limits for the mean of a normally distributed population from which the following sample was taken 15,17,10,18,16,9,7,11,13,14.	5	CO5																					
4.	A random sample of 100 teachers in a large metropolitan area revealed a mean weekly salary of Rs,487 with a standard deviation Rs.48. With what degree of confidence can we assert that the average weekly salary of all teachers in the metropolitan area is between 472 to 502 ?	1	CO5																					
5.	Explain the procedure of testing of hypothesis.	2	CO5																					
6.	A sample of 900 members has a mean of 3.4cms and S.D 2.61cm. Is this sample has been taken from a large population with mean 3.25cm If the population is normal and its mean is unknown, test the hypothesis and also find the 95% confidence limits of true mean.	4	CO5																					
7.	A researcher wants to know the intelligence of students in a school. He selected two groups of students. In the first group there are 150 students having the mean IQ of 75 with a S.D of 15, in the second group there are 250 students having the mean IQ of 70 with S.D of 20.	4	CO5																					
8.	<p>The samples of students were drawn from two universities and from their weights in kilograms, means and standard deviations are calculated below. Make a large sample test to test the significance of the difference between the means.</p> <table border="1" style="margin-left: 20px;"> <thead> <tr> <th></th> <th>Size of sample</th> <th>Means</th> <th>S.D's</th> </tr> </thead> <tbody> <tr> <td>University A</td> <td>400</td> <td>55</td> <td>10</td> </tr> <tr> <td>University B</td> <td>100</td> <td>57</td> <td>15</td> </tr> </tbody> </table>		Size of sample	Means	S.D's	University A	400	55	10	University B	100	57	15	5	CO5									
	Size of sample	Means	S.D's																					
University A	400	55	10																					
University B	100	57	15																					
9.	In a sample of 1000 people in Karnataka 540 are rice eaters and the rest are wheat eaters. Can we assume that the both rice and wheat are equally popular in this state at 1% level of significance?	4	CO5																					
10.	In two large populations, there are 30% and 25% respectively of fair haired people. Is this difference likely to be hidden in samples of 1200 and 900 respectively from two populations?	4	CO5																					

UNIT V

PART A

1 MARK QUESTIONS

		BT	COURSE
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		LEVEL	OUTCOME
1.	Define State space and parameter space.	1	CO6
2.	Define stochastic process.	1	CO6
3.	What are the formulae for the measure of Gambler's ruin in biased and unbiased cases?	1	CO6
4.	Define the Markov process.	1	CO6
5.	Define the Stochastic matrix.	1	CO6
6.	What are the properties of stochastic matrix?	1	CO6
7.	What is the condition for the regular and non-regular matrices?	1	CO6
8.	Classify the stochastic process.	2	CO6
9.	What is the formula for expected duration of the game?	1	CO6
10	Define the ergodicity?	1	CO6

PART B

10 MARKS QUESTIONS

1	Find expected duration of the game (d_z) if $p=\frac{1}{3}$, $q=\frac{1}{2}$, $z=1$ and $a=1000$.	5	CO6
2	Ashok bought a share of stock for \$10, and it is believed that the stock price moves (day by day) as a simple random walk with $p = 0.55$. a) What is the probability that Ashok's stock reaches the high value of \$15 before the low value of \$5? b) What is the probability that Ashok will become infinitely rich? (BR-18,March-2021)	2	CO6
3.	Which of the following are regular matrices? i) $\begin{pmatrix} 0 & 0 & 1 \\ \frac{1}{2} & 0 & \frac{1}{2} \\ 0 & 1 & 0 \end{pmatrix}$ ii) $\begin{pmatrix} \frac{1}{2} & \frac{1}{4} & \frac{1}{4} \\ 0 & 1 & 0 \\ \frac{1}{2} & 0 & \frac{1}{2} \end{pmatrix}$ iii) $\begin{pmatrix} \frac{1}{2} & \frac{1}{2} & 0 \\ \frac{1}{2} & \frac{1}{2} & 0 \\ \frac{1}{4} & \frac{1}{4} & 0 \end{pmatrix}$	1	CO6
4.	A fair die is tossed repeatedly. If X_n denotes the maximum of the numbers occurring in the first n tosses, Find the transition probability matrix P of the markov chain $\{X_n\}$. Find also P^2 and $P(X_2 = 6)$ (BR-18-March2021)	3	CO6
5.	Which of the following are stochastic matrices? i) $\begin{pmatrix} 1 & 0 \\ \frac{1}{2} & \frac{1}{2} \end{pmatrix}$ ii) $\begin{pmatrix} \frac{1}{2} & -\frac{1}{2} \\ \frac{1}{4} & \frac{3}{4} \end{pmatrix}$ iii) $\begin{pmatrix} \frac{1}{3} & \frac{2}{3} & \frac{4}{3} \\ \frac{1}{2} & 1 & \frac{1}{2} \end{pmatrix}$	3	CO6
6.	The transition probability matrix (t p m) is given as follows. is the matrix irreducible? $\begin{pmatrix} 0.3 & 0.7 & 0 \\ 0.1 & 0.4 & 0.5 \\ 0 & 0.2 & 0.8 \end{pmatrix}$		CO6
7.	A training process considered as a two state Markov chain. If it rains, it is considered to be in state '0' and it does not rains is in the state of '1'. The transition probability of the Markov chain is defined by $\mathbf{P} = \begin{pmatrix} 0.6 & 0.4 \\ 0.2 & 0.8 \end{pmatrix}$ Find the probability that it will rain for 3 days from today assuming that it is raining today. .(BR-16-December-2018)	5	CO6
8.	Three boys A, B and C are throwing a ball to each other. A always throw the ball to B and B always throws the ball to C: but C is just as likely to throw the ball to B as to A. Show that the process is the Markov chain. Find the transition matrix and classify the states.	5	CO6



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9.	<p>The transition probability matrix (t p m) of a markov chain{ X_n }1,2,3,..... having three states 1,2, and 3 is $P = \begin{pmatrix} 0.3 & 0.7 & 0 \\ 0.1 & 0.4 & 0.5 \\ 0 & 0.2 & 0.8 \end{pmatrix}$ And the initial distribution is, $P^0 = [0.7, 0.2, 0.1]$</p> <p>Find (i) $P\{ X_2=3 \}$ (ii) $P\{ X_3=2 , X_2=3 , X_1=3 , X_0=2 \}$</p>	1	CO6
10	<p>Explain briefly about the stochastic matrix and the Markov process.</p>	2	CO6

MID-1 MODEL PAPER

BR-20

D4

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)

(R20MTH2104) MATHEMATICAL AND STATISTICAL FOUNDATION
(COMMON TO AIML,CS&DS)

Duration: 90Mins

Max Marks: 25M

Section – A

Answer All the questions

5Qx1M = 5M

1. Find the greatest common factor of 15 and 35.
2. State Chinese Remainder Theorem.
3. What are the normal equations for straight line ?
4. Write the recurrence relation of Poisson distribution.
5. What is the standard error of the statistic sample mean?

Section – B

Answer any FOUR questions

4Qx5M = 20M

1. Show that if a, b and c are integers with $(a, b) = (a, c) = 1$ then $(a, bc) = 1$.
2. Prove that if $(a, m) = 1$ then the linear congruence $ax \equiv b \pmod{m}$ has a unique solution
3. From a sample of 200 pairs of observation the following quantities were calculated $\sum X = 11.34$, $\sum Y = 20.78$, $\sum X^2 = 12.16$, $\sum Y^2 = 84.96$, $\sum XY = 22.13$ from the above data compute the regression coefficients of the equation $Y = \alpha + \beta X$.
4. If X is Poisson variate such that, $3P(x=4) = 0.5 P(x=2) + P(x=0)$ then find the mean of X and $P(x \leq 2)$.
5. Box A contains 5 red and 3 white marbles and box B contains 2 red and 6 white marbles. If a marble is drawn from each box, what is the probability that they are both of same colour.
6. In a Normal distribution 7% of the items are under 35 and 89% are under 63. Determine the mean and variance of the distribution

MID-II MODEL PAPER

BR-20

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 - II Mid Term Examinations (Model paper)
(R20MTH2104) MATHEMATICAL AND STATISTICAL FOUNDATIONS
(COMMON TO AIML,CS&DS)

D4

Duration: 90Mins

Max Marks: 25M

Section – A

Answer All the questions

5Qx1M = 5M

1. What the central limit theorem
2. Define point estimation and interval estimation.
3. Write the test statistic for difference of two proportions
4. Define the Markov process.
5. Define the ergodicity?

Section – B

Answer any FOUR questions

4Qx5M = 20M

1. Find the probability that out of 100 patients between 84 and 95 inclusive will survive a heart-operation given that the chances of survival is 0.9
2. A random sample of 100 teachers in a large metropolitan area revealed a mean weekly salary of Rs,487 with a standard deviation Rs.48. With what degree of confidence can we assert that the average weekly salary of all teachers in the metropolitan area is between 472 to 502 ?
3. Explain the procedure of testing of hypothesis.
4. In two large populations, there are 30% and 25% respectively of fair haired people. Is this difference likely to be hidden in samples of 1200 and 900 respectively from two populations?
5. Three boys A, B and C are throwing a ball to each other. A always throw the ball to B and B always throws the ball to C: but C is just as likely to throw the ball to B as to A. Show that the process is the Markov chain. Find the transition matrix and classify the states.
6. Explain briefly about the stochastic matrix and the Markov process.

II B.Tech - I Semester –End Examinations (Model paper)
(R20MTH2104) MATHEMATICAL AND STATISTICAL FOUNDATIONS
(COMMON TO AIML,CS&DS)

Duration: 3 Hrs**Max Marks: 70M****Answer All the following questions****Marks: 5Qx4M = 20M**

- Show that if a, b and c are integers with $(a, b) = (a, c) = 1$ then $(a, bc) = 1$.
- If X is Poisson variate such that, $3P(x=4) = 0.5 P(x=2) + P(x=0)$ then find the mean of X and $P(x \leq 2)$.
- Explain briefly t-distribution
- Explain about Null hypothesis & Alternative hypothesis.
- Which of the following are regular matrices?

$$i) \begin{pmatrix} 1 & 1 & 1 \\ \frac{1}{2} & \frac{1}{4} & \frac{1}{4} \\ 0 & 1 & 0 \\ \frac{1}{2} & 0 & \frac{1}{2} \end{pmatrix} \quad ii) \begin{pmatrix} 1 & 1 & 0 \\ \frac{1}{2} & \frac{1}{2} & 0 \\ \frac{1}{2} & \frac{1}{2} & 0 \\ \frac{1}{4} & \frac{1}{4} & 0 \end{pmatrix}$$

Answer All the following questions**Marks: 5Qx10M = 50M**

- How many incongruent solutions does each of the following systems of congruence have
 - $2x + y + z \equiv 1 \pmod{5}$
 - $x + 2y + z \equiv 1 \pmod{5}$
 - $x + y + 2z \equiv 1 \pmod{5}$

(or)
- Show that the greatest common divisor of the integers a and b that are not both zero, is the least positive integer that is a linear combination of a and b .**
- If the probability density of a random variable is given by

$$f(x) = \begin{cases} K(1 - x^2); & 0 < x < 1 \\ 0 & \text{otherwise} \end{cases}$$
 Find the value of 'K' and the probabilities that a random variable will take on a value i) between 0.1 and 0.2 ii) greater than 0.5

(or)
- In a bolt factory machines A, B, C manufacture 29% , 30% and 50% of the total of their output and 6%, 3% and 2% are defective. A bolt is drawn at random and found to be defective. Find the probabilities that it is manufactured from (i) Machine A (ii) Machine B (iii) Machine C.
- If X is a normal variant, find the area A
 - to the left of $z = -1.78$
 - to the right of $z = -1.45$
 - Corresponding to $-0.8 \leq z \leq 1.53$
 - to the left of $z = -2.52$ and to the right of $z = 1.83$

(or)
- Consider all the samples of size 2 are taken from population 3, 6, 9, 15, 27 with replacement. Then find
 - The populations mean.
 - The population standard deviation.
 - The mean of the sampling distribution of means.
 - The standard deviation of the sampling distribution of means.

12. In a sample of 1000 people in Karnataka 540 are rice eaters and the rest are wheat eaters. Can we assume that the both rice and wheat are equally popular in this state at 1% level of significance?

(or)

13. A sample of 900 members has a mean of 3.4cms and S.D 2.61cm. Is this sample has been taken from a large population with mean 3.25cm If the population is normal and its mean is unknown, test the hypothesis and also find the 95% confidence limits of true mean.
14. A training process considered as a two state Markov chain. If it rains, it is considered to be in state '0' and it does not rains is in the state of '1'. The transition probability of the Markov chain is defined by $\mathbf{P} = \begin{pmatrix} 0.6 & 0.4 \\ 0.2 & 0.8 \end{pmatrix}$ Find the probability that it will rain for 3 days from today assuming that it is raining today.

(or)

15. The transition probability matrix (t p m) of a markov chain $\{ X_n \}$ 1,2,3,..... having three states 1,2, and 3 is $\mathbf{P} = \begin{pmatrix} 0.3 & 0.7 & 0 \\ 0.1 & 0.4 & 0.5 \\ 0 & 0.2 & 0.8 \end{pmatrix}$ And the initial distribution is, $\mathbf{P}^0 = [0.7, 0.2, 0.1]$ Find (i) $P\{ X_2=3 \}$ (ii) $P\{ X_3=2, X_2=3, X_1=3, X_0=2 \}$

COMPUTER ORGANIZATION AND ARCHITECTURE

SRI INDU COLLEGE OF ENGINEERING & TECHNOLOGY

(An Autonomous Institution under UGC, New Delhi)

B.Tech. - II Year – I Semester

L	T	P	C
3	0	0	3

(R20CSE2102) Computer Organization & Architecture

Co-requisite: A Course on “Digital Logic Design and Microprocessors”.

Course Objectives:

- The purpose of the course is to introduce principles of computer organization and the basic architectural concepts.
- It begins with basic organization, design, and programming of a simple digital computer and introduces simple register transfer language to specify various computer operations.
- Topics include computer arithmetic, instruction set design, microprogrammed control unit, pipelining and vector processing, memory organization and I/O systems, and multiprocessors

Course Outcomes:

- Understand the basics of instructions sets and their impact on processor design.
- Demonstrate an understanding of the design of the functional units of a digital computer system.
- Evaluate cost performance and design trade-offs in designing and constructing a computer processor including memory.
- Design a pipeline for consistent execution of instructions with minimum hazards.
- Recognize and manipulate representations of numbers stored in digital computers

UNIT - I

Digital Computers: Introduction, Block diagram of Digital Computer, Definition of Computer Organization, Computer Design and Computer Architecture.

Register Transfer Language and Micro operations: Register Transfer language, Register Transfer, Bus and memory transfers, Arithmetic Micro operations, logic micro operations, shift micro operations, Arithmetic logic shift unit.

Basic Computer Organization and Design: Instruction codes, Computer Registers Computer instructions, Timing and Control, Instruction cycle, Memory Reference Instructions, Input – Output and Interrupt.

UNIT - II

Microprogrammed Control: Control memory, Address sequencing, micro program example, design of control unit.

Central Processing Unit: General Register Organization, Instruction Formats, Addressing modes, Data Transfer and Manipulation, Program Control.

UNIT - III

Data Representation: Data types, Complements, Fixed Point Representation, Floating Point Representation.

Computer Arithmetic: Addition and subtraction, multiplication Algorithms, Division Algorithms, Floating – point Arithmetic operations. Decimal Arithmetic unit, Decimal Arithmetic operations.

COMPUTER SCIENCE & ENGINEERING (CYBER SECURITY)

UNIT - IV

Input-Output Organization: Input-Output Interface, Asynchronous data transfer, Modes of Transfer, Priority Interrupt Direct memory Access.

Memory Organization: Memory Hierarchy, Main Memory, Auxiliary memory, Associate Memory, Cache Memory.

UNIT - V

Reduced Instruction Set Computer: CISC Characteristics, RISC Characteristics.

Pipeline and Vector Processing: Parallel Processing, Pipelining, Arithmetic Pipeline, Instruction Pipeline, RISC Pipeline, Vector Processing, Array Processor.

Multi Processors: Characteristics of Multiprocessors, Interconnection Structures, Interprocessor arbitration, Interprocessor communication and synchronization, Cache Coherence.

TEXT BOOK:

1. Computer System Architecture – M. Moris Mano, Third Edition, Pearson/PHI.

REFERENCE BOOKS:

1. Computer Organization – Car Hamacher, Zvonks Vranesic, Safaa Zaky, Vth Edition, McGraw Hill.
2. Computer Organization and Architecture – William Stallings Sixth Edition, Pearson/PHI.
3. Structured Computer Organization – Andrew S. Tanenbaum, 4th Edition, PHI/Pearson.



SRI INDU COLLEGE OF ENGG & TECHNOLOGY

**LESSON PLAN
(Regulation :R20)**

Department of CSE (Cyber Security)


Prepared on oct-12-2021

Sub. Code & Title **R20CSE2102 Computer Organization and Architecture**

Academic Year: 2021-22 **Year/Sem./Section** **II-I-CS**


Faculty Name & Designation **K.SHWETHA, ASST.PROFESSOR**

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								
I	INTRODUCTION –DIGITAL COMPUTERS					16		
1.1	Digital Computers: Introduction	T1	1	11	Black board	02		CO1,L2
1.2	Block diagram of Digital Computer	T1	15	16	PPT	01		CO1,L6
1.3	Definition of Computer Organization, Computer Design and Computer Architecture.	T1	3	4	Black board	01		CO1,L1
1.4	Register Transfer Language and Micro operations: Register Transfer language.	T1	111	112	Black board	01		CO1,L2
1.5	Register Transfer	T1	112	115	Black board	01		CO1,L2
1.6	Bus and memory transfers	T1	115	119	Black board	01		CO1,L1
1.7	logic micro operations	T1	125	130	Black board	01		CO1,L3
1.8	shift micro operations	T1	130	133	Black board	01		CO1,L3
1.9	Arithmetic logic shift unit.	T1	133	135	Black board	01		CO2,L3
1.10	Basic Computer Organization and Design:	T1	141	144	Black board	01		CO2,L2
1.11	Computer Registers	T1	144	149	Seminar	01		CO1,L1
1.12	Computer instructions	T1	149	153	Black board	01		CO1,L2
1.13	Timing and Control	T1	153	156	Black board	01		CO1,L1
1.14	Instruction cycle	T1	156	161	PPT	01		CO1,L4
1.15	Memory Reference Instructions, Input – Output and Interrupt.	T1	162	172	Black board	01		CO3,L4
	Review	Signature of the HOD/Coordinator						

	SRI INDU COLLEGE OF ENGG & TECHNOLOGY LESSON PLAN (Regulation :R20) Department of CSE (Cyber Security)		Prepared on oct-12-2021		
	Sub. Code & Title	R20CSE2102 Computer Organization and Architecture			
	Academic Year: 2021-22		Year/Sem./Section	II-I-CS	
	Faculty Name & Designation		K.SHWETHA, ASST.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-II								
I	Micro programmed Control, Central Processing unit					12		
2.1	Micro programmed Control: Control memory	T1	235	238	Black board	01		CO3,L1
2.2	Address sequencing	T1	238	241	PPT	01		CO2,L2
2.3	Micro program example	T1	242	252	Black board	01		CO2,L1
2.4	Design of control unit.	T1	253	257	Black board	02		CO2,L2
2.5	Central Processing Unit: General Register Organization,	T1	265	270	Black board	01		CO2,L1
2.6	Stack Organization	T1	271	277	PPT	01		CO2,L2
2.7	Instruction Formats: Three Address Instructions, Two Address Instructions	T1	278	283	Black board	01		CO2,L3
2.8	Addressing modes	T1	283	289	Black board	01		CO2,L4
2.9	Data Transfer and Manipulation	T1	289	295	Black board	02		CO5,L1
2.10	Program Control.	T1	295	304	Black board	01		CO2,L1
	Review	Signature of the HOD/Coordinator						

it/ Item No.	Topic (s)	Book Reference	Page (s)		Teaching Methodology	Proposed No. of Periods	Actual Date of Handled	CO/RBT
			From	To				
UNIT-III								
I	Data Representation, Computer Arithmetic					11		
3.1	Data Representation: Data types	T1	81	87	Black board	02		CO3,L2
3.2	Complements (r-1)'s Complement and (r's Complement)	T1	89	90	Black board	01		CO3,L3
3.3	Fixed Point Representation,	T1	91	95	Black board	01		CO5,L1

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3.4	Floating Point Representation.	T1	97	97	Black board	02		CO5,L1
3.5	Computer Arithmetic: Addition and subtraction	T1	365	370	PPT	02		CO3,L3
3.6	Multiplication Algorithms	T1	372	377	Black board	01		CO3,L3
3.7	Floating – point Arithmetic operations.	T1	385	393	Black board	01		CO3,L3
3.8	Decimal Arithmetic unit	T1	395	398	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-IV								
IV	Input Output Organization, Memory Organization					14		
4.1	Input-Output Organization: Input-Output Interface	T1	413	421	Black board	02		CO4,L2
4.2	Asynchronous data transfer	T1	422	431	Black board	01		CO4,L1
4.3	Modes of Transfer	T1	433	437	Seminar	02		CO4,L2
4.4	Priority Interrupt	T1	437	445	Black board	02		CO4,L1
4.5	Direct memory Access.	T1	446	448	Black board	01		CO3,L6
4.6	Discuss Memory Hierarchy, Main Memory	T1	479	490	Black board	01		CO3,L2
4.7	Auxiliary memory	T1	493	495	Black board	01		CO3,L1
4.8	Associate Memory	T1	495	500	Black board	02		CO3,L1
4.9	Cache Memory	T1	500	508	PPT	02		CO3,L1
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-V								
V	Reduced Instruction Set Computer, Pipeline and Vector Processing ,Multiprocessors					16		
5.1	Reduced Instruction Set Computer:	T1	304	305	Black board	01		CO5,L2

	CISC Characteristics,							
5.2	RISC Characteristics.	T1	306	312	Black Board	01		CO5,L2
5.3	Pipeline & Vector Processing	T1	323	328	Black board	01		CO4,L1
5.4	Parallel Processing,	T1	323	328	Black board	02		CO4,L1
5.5	Pipelining, Arithmetic Pipeline,	T1	329	336	Black board	01		CO4,L1
5.6	Instruction Pipeline,	T1	337	343	Black board	01		CO4,L1
5.7	RISC Pipeline,	T1	343	348	Black board	02		CO4,L1
5.8	Vector Processing,	T1	348	354	PPT	01		CO5,L1
5.9	Array Processor	T1	354	356	Black board	01		CO5,L2
5.10	Multi Processors: Characteristics of Multiprocessors,	T1	529	531	Black board	01		CO6,L2
5.11	Interconnection Structures,	T1	531	539	Black board	01		CO6,L5

5.12	Inter - Processor arbitration,	T1	539	544	Black board	01		CO6,L1
5.13	Inter - Processor communication and synchronization,	T1	545	548	PPT	01		CO6,L1
5.14	Cache Coherence.	T1	550	553	Black board	01		CO6,L2
	Review	Signature of the HOD/Coordinator						



**SRI INDU COLLEGE OF ENGG &
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**Prepared on
oct-12-2021**

Sub. Code & Title	R20CSE2102 Computer Organization and Architecture		
Academic Year: 2021-22	Year/Sem./Section	II-I-CS	
Faculty Name & Designation	K.SHWETHA, ASST.PROFESSOR		

LIST OF TEXT BOOKS AND REFERENCES

TEXT BOOKS:

T1. Computer System Architecture – M. Moris Mano, Third Edition, Pearson/PHI.

REFERENCE BOOKS:

R1. Computer Organization – Car Hamacher, Zvonks Vranesic, Safea Zaky, Vth Edition, McGraw Hill

R2. Computer Organization and Architecture – William Stallings Sixth Edition, Pearson/PHI.

R3. Structured Computer Organization – Andrew S. Tanenbaum, 4th Edition, PHI/Pearson.

WEB LINKS:

W1. <https://www.mooc-list.com/tags/computer-architecture>

W2. https://onlinecourses.nptel.ac.in/noc21_cs61/preview

W3. <https://www.edx.org/course/computer-architecture>



**SRI INDU COLLEGE OF ENGG &
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ASSIGNMENT QUESTIONS

S.No.	Assignment Questions	Course Outcome	Books To be Referred	Date of Announcement	Date of submission
1	How to do address sequencing with diagram	CO1	T1	Dec-10-21	Dec-13-21
2.	What is instruction format? Explain the different instruction formats in detail.	CO1	T1	Dec-10-21	Dec-13-21
3.	Draw and explain typical hardware control unit .	CO2	T1	Dec-10-21	Dec-13-21
4.	Determine the input-output configuration	CO2	T1	Dec-10-21	Dec-13-21
5.	Draw and explain the one stage decimal arithmetic unit.	CO3	T1	Dec-10-21	Dec-13-21
6.	Explain the booth's multiplication algorithm with neat sketch of hardware design	CO3	T1	Feb-7-22	Feb-9-22
7.	What is IOP? Explain the communication between IOP and CPU.	CO4	T1	Feb-7-22	Feb-9-22
8.	Explain in detail about Cache memory mechanisms.	CO4	T1	Feb-7-22	Feb-9-22
9.	Explain the different types of Pipeline techniques.	CO5	T1	Feb-7-22	Feb-9-22
10.	Explain in detail about the Instruction Pipeline .	CO5	T1	Feb-7-22	Feb-9-22

SELF STUDY TOPICS

S.No.	Topics	Books & Journals	Course Outcomes
1	Von Neumann Architecture	Computer System Architecture – M. Moris Mano, Third Edition, Pearson/PHI.	CO1
2	The five generations of computers	Computer System Architecture – M. Moris Mano, Third Edition, Pearson/PHI.	CO1



SRI INDU COLLEGE OF ENGG & TECHNOLOGY
QUESTION BANK
(Regulation :R20)
Department of CSE (CS)

Prepared on:29.9.21
Rev1:

Sub. Code & Title | **R20CSE2102 Computer Organization and Architecture**

Academic Year: 2021-22 | **Year/Sem./Section** | **II-I-CS**

Faculty Name & Designation | **K.SHWETHA , ASST.PROFESSOR**

QUESTION BANK WITH BLOOMS TAXONOMY LEVEL (BTL)

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

UNIT-I: Digital Computers, Basic Computer Organization and Design

<u>1 MARK Questions</u>			
		BT LEVEL	COURSE OUTCOME
1	Define Computer Architecture?	1	CO1
2	Define a Digital Computer? Draw block diagram of Computer?	1	CO1
3	What is the need of Register? Explain the different types of Registers?	1	CO1
4	What is control memory? Oct-2020	1	CO3
5	Define a Micro Program & Micro Instruction?	1	CO1
6	Define CO,CA and CD.?	1	CO1
7	Define Instruction Cycle?	1	CO1
8	List Computer Registers?	1	CO1
9	Discuss Timing And Control?	2	CO1
10	Explain About ALU?	2	CO1
10 MARKS			
1	How to do address sequencing with diagram?	5	CO1
2	What is instruction format? Explain the different instruction formats in detail?	5	CO1
3	Explain the different phases of Instruction Cycle?	2	CO1
4	Explain the Micro Program Control with Diagram & Examples?	2	CO1
5	List out any 5 Registers with explains in detail?	5	CO1
6	Demonstrate the Three – State Bus Buffer with neat diagram?	3	CO1
7	List and Explain in detail about the memory reference Instructions?	1	CO1
8	Draw the flowchart for interrupt cycle and experiment with it with explanation? Oct-2020	3	CO1
9	Determine the input-output configuration?	3	CO1
10	Explain the stored program organization with neat diagram?	2	CO1
11	Explain the bus system for four registers using multiplexer with neat diagram?	2	CO1



SRI INDU COLLEGE OF ENGG & TECHNOLOGY
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**Unit -II : Micro programmed Control,
 Central Processing Unit**

<u>1 MARK Questions</u>		BT LEVEL	COURSE OUTCOME
1	Define Data path.?	1	CO2
2	Define Latency and throughput?	1	CO2
3	Discuss the principle operation of micro programmed control unit?	2	CO2
4	What is control store?	2	CO2
5	Define Processor clock?	1	CO2
6	Write example micro programs?	2	CO2
7	Define control unit.?	1	CO2
8	Define Program Control?	1	CO2
9	Explain data representation?	2	CO5
10	What is Floating Point Representation?	2	CO5
<u>10 MARK Questions</u>			
1	Draw and explain typical hardware control unit?	2	CO2
2.	Draw and explain about micro program control unit?	2	CO2
3.	Write short notes on (i) Micro instruction format (ii) Symbolic micro instruction.	2	CO2
4.	Explain multiple bus organization in detail?	2	CO2
5.	Explain in detail about address sequencing?	2	CO2
6.	Explain in detail about conditional branching with neat diagram?	2	CO2
7.	Explain general register organization in detail with neat diagrams ?	2	CO2
8	Explain Stack organization in detail with neat diagrams?	2	CO2
9.	Evaluate the following program using three address Instruction format $X = (A+B) * (C+D)$ Nov-2019	3	CO2
10.	Evaluate the following program using two address Instruction format $X = (A+B) * (C+D)$ Nov-2019	3	CO2
11.	Evaluate the following program using one address Instruction format $X = (A+B) * (C+D)$ Nov-2019	3	CO2
12.	Classify addressing modes and explain each type with example? Oct-2020	1	CO2



SRI INDU COLLEGE OF ENGG & TECHNOLOGY
QUESTION BANK
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Academic Year: 2021-22 **Year/Sem./Section** **II-I-CS**

Faculty Name & Designation **K.SHWETHA , ASST.PROFESSOR**

Unit -III : Data Representation,Computer Arithmetic

<u>1 MARK Questions</u>		BT LEVEL	COURSE OUTCOME
1.	Convert the following decimal number to the base indicated 7562 to octal 1938 to hexadecimal?	1	CO3
2.	Find the 1's and 2's complement of the following eight digit binary number a. 10101110 b. 10000001?	1	CO3
3	List the steps of Booth's Multiplication algorithm? Dec-2019	1	CO3
4	Convert the following decimal number to the base indicated 17562 to octal 11938 to hexadecimal?	2	CO3
5	Briefly explain r's complement with example?	2	CO3
6	List out computer arithmetic operations?	1	CO3
7	Design division algorithm? Nov-2018	6	CO2
8	Explain floating point arithmetic?	2	CO3
9	Explain about different Data types?	2	CO3
10	Explain about Fixed point Representation?	2	CO3
10 MARKS			
1.	Draw and explain the hardware for signed – magnitude addition and subtraction?	2	CO3
2	Explain the booth's multiplication algorithm with neat sketch of hardware design?	2	CO3
3.	Perform division of 1000 and 0011 using restoring division algorithm?	3	CO3
4	Multiply 7 and 3 using Booth's algorithm?	2	CO3
5.	Draw a flowchart for adding and subtracting two fixed point binary numbers where negative numbers are signed 1's complement presentation?	2	CO3
6	Multiply each of the following pairs of signed 2's compliment numbers using the Booth multiplication and n- bit multipliers. In each case assume that A is multiplicand and B is multiplier. (i) A=010111 and B=110110. (ii) A=110011 and B=101100 ?	3	CO3
7.	Discuss about the IEEE standard for binary floating point arithmetic?	2	CO3
8.	Draw the flowchart for divide operation and explain?	2	CO3
9.	Draw and explain the one stage decimal arithmetic unit?	2	CO3
10.	Explain in detail about the derivation of BCD adder? Nov-2018	2	CO3



SRI INDU COLLEGE OF ENGG & TECHNOLOGY
QUESTION BANK
(Regulation :R20)
Department of CSE (CS)

Prepared on:29.9.21
 Rev1:

Sub. Code & Title | **R20CSE2102 Computer Organization and Architecture**

Academic Year: 2021-22 | **Year/Sem./Section** | **II-I-CS**

Faculty Name & Designation | **K.SHWETHA , ASST.PROFESSOR**

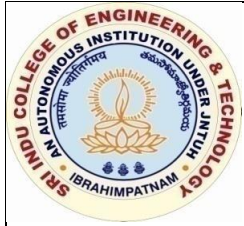
Unit-IV : Input Output Organization, Memory Organization

1 MARK QUESTIONS

1.	What is DMA? Oct-2020	2	CO4
2.	What is the need of I/O Interface? Oct-2020	1	CO4
3.	Define Priority Interrupt?	1	CO4
4.	List out any 5 IO Devices?	1	CO4
5.	What are peripheral devices? Give a note on video monitors?	2	CO4
6.	Discuss Asynchronous Data?	2	CO4
7.	Explain Main Memory ?	2	CO3
8.	Define Cache Memory, Auxiliary Memory, Associate Memory? Nov-2019	1	CO3
9.	Explain Modes of transfer ?	2	CO4
10.	Define IOI?	1	CO4

10 MARKS QUESTIONS

1.	What is asynchronous data transfer? Explain the different types of Asynchronous data transfer techniques?	2	CO4
2.	Explain in detail floating point arithmetic operations with examples?	2	CO4
3.	What is IOP? Explain the communication between IOP and CPU?	2	CO4
4.	Explain the following data transfer modes/techniques? a)Program Controlled IO b)Interrupt Initiated IO	2	CO4
5.	Write a note on memory hierarchy with the neat diagram? Nov-2019	2	CO3
6.	Consider a cache consisting of 256 blocks of 8 words each, for a total of 2048 words, and assume that the main memory is addressable by a 16-bit address. The main memory has 64K words which are divided into 8192 blocks of 8 words each. Find the number of bits in Tag, Block and Word Field of the main memory address for direct mapping scheme?	1	CO4
7.	Explain in detail about DMA operation with neat diagram ? Nov-2019	2	CO4
8.	Describe in brief the different modes by which data transfer can take place between a Computer unit and its I/O devices. What is the difference between synchronous and asynchronous data transfer? Nov-2018	2	CO4
9.	Explain in detail about Cache memory mechanisms? Oct-2020	2	CO3
10.	Explain in detail about Associative memory mechanisms?	2	CO3



SRI INDU COLLEGE OF ENGG & TECHNOLOGY
QUESTION BANK
 (Regulation :R20)
 Department of CSE (CS)

Prepared on:29.9.21
 Rev1:

Sub. Code & Title | **R20CSE2102 Computer Organization and Architecture**

Academic Year: 2021-22 | **Year/Sem./Section** | **II-I-CS**

Faculty Name & Designation | **K.SHWETHA , ASST.PROFESSOR**

Unit-V: Reduced Instruction Set Computer, Pipeline & Vector Processing , Multiprocessors

1 MARK QUESTIONS

1.	List out the memory hierarchy?	1	CO3
2.	What is associative memory?	1	CO3
3.	What is the need of Cache Memory?	1	CO3
4.	Define a Pipeline? Give an example?	2	CO4
5.	What is inter process arbitration?	2	CO6
6.	Define Vector Processing?	2	CO6
7.	Define RISC & CISC?	1	CO6
8.	Define IPC And Synchronization?	1	CO6
9.	List out pipelining types?	1	CO4
10.	Discuss the difference between RISC & CISC? (Dec 2019)	2	CO6

10 MARKS QUESTIONS

1.	Explain the different types of Pipeline techniques? Nov-2019	2	CO4
2.	What is mean by IPC. Explain the Concurrency & Synchronization with IPC?	2	CO6
3.	What is Multiprocessors? Explain in detail ?	1	CO6
4.	List out Cache mapping techniques and Explain all the mapping techniques?	2	CO6
5.	Define Auxiliary memory ? Explain with neat diagram?	2	CO6
6.	Explain in detail about the RISC Characteristics? Oct-2020	2	CO6
7.	Explain in detail about the CISC Characteristics?	2	CO6
8.	Explain in detail about the Instruction Pipeline?	2	CO4
9.	List the Characteristics of Multiprocessors. Explain in detail about the Interconnection structures of Multiprocessor?	2	CO6
10.	Explain in detail about the Inter processor arbitration ?	2	CO6

END EXAMINATION- MODEL PAPER

BR-20

D4

Subject Code: R20CSE2102

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 –End Examinations (Model paper)

COMPUTER ORGANIZATION & ARCHITECTURE

Duration: 3 Hrs

Max Marks: 70M

Section – A

Answer All the following questions
= 20M

Marks: 5Qx4M

1. Define Computer Architecture?
2. What is Floating Point Representation?
3. Find the 1's and 2's complement of the following eight digit binary number?
 - a. 10101110
 - b. 10000001
4. Explain Modes of transfer?
5. Differentiate between the RISC & CISC?

Section – B

Answer any FIVE questions choosing at least one from each Unit

Marks:

5Qx10M = 50M

UNIT - I

6. Explain the stored program organization with neat diagram?
(OR)
7. Draw the flowchart for interrupt cycle and experiment with it with explanation?

UNIT - II

8. Evaluate the following program using one address Instruction format
 $X = (A+B) * (C+D)$?

(OR)

9. Draw and explain typical hardware control unit?

UNIT - III

10. Perform division of 1000 and 0011 using restoring division algorithm?

(OR)

11. Explain floating point arithmetic?

UNIT - IV

12. Describe in brief the different modes by which data transfer can take place between a computer unit and its I/O devices. What is the difference between synchronous and asynchronous data transfer?

(OR)

13. Write a note on memory hierarchy with the neat diagram?

UNIT - V

14. Write the Characteristics of Multiprocessors. Explain in detail about the Interconnection structures of Multiprocessor?

(OR)

15. Explain the different types of Pipeline techniques?

MID I MODEL PAPER

BR-20 SRI INDU COLLEGE OF ENGINEERING & TECHNOLOGY D4
(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)
(R20CSE2102) COMPUTER ORGANIZATION & ARCHITECTURE
Duration: 90Mins Max Marks: 25M

Section – A

Answer All the questions

5Qx1M = 5M

1. Define Computer Architecture?
2. Explain data representation?
3. What is control memory?
4. Define control unit?
5. Find the 1's and 2's complement of the following eight digit binary number.
 - a. 10101110
 - b. 10000001

Section – B

Answer any FOUR questions

4Qx5M = 20M

6. Explain about Von Neumann architecture?
7. Draw the flowchart for interrupt cycle and experiment with explanation?
8. Evaluate the following program using three address Instruction format
 $X = (A+B) * (C+D) ?$
9. Explain multiple bus organization in detail?
10. Explain the booth's algorithm with neat sketch of hardware design ?
11. Explain the different phases of instruction cycle?

MID-2 MODEL PAPER

BR-20 SRI INDU COLLEGE OF ENGINEERING & TECHNOLOGY D4
(An Autonomous Institution Under 2(f) and 12(B) of UGC Act 1956, New Delhi)
II B.Tech - I Semester - II Mid Term Examinations (Model paper)
(R20CSE2102) COMPUTER ORGANIZATION & ARCHITECTURE
Duration: 90Mins Max Marks: 25M

Section – A

Answer All the questions

5Qx1M = 5M

1. List out the steps of Booth's algorithm?
2. Define Priority Interrupt?
3. Define Cache Memory, Auxiliary Memory, Associate Memory?
4. Differentiate between the RISC & CISC?
5. Explain Vector Processing?

Section – B

Answer any FOUR questions

4Qx5M = 20M

6. Explain about Von Neumann architecture?
7. Evaluate the following program using one address Instruction format
 $X = (A+B) * (C+D) ?$
8. Describe in brief the different modes by which data transfer can take place between a computer unit and its I/O devices. What is the difference between synchronous and asynchronous data transfer?
9. Explain the different types of Pipeline techniques?
10. Write the Characteristics of Multiprocessors. Explain in detail about the Interconnection structures of Multiprocessor?
11. . Explain in detail about the Instruction Pipeline?

PYTHON ROGRAMMING

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

B.Tech. - II Year – I Semester

L	T	P	C
2	0	0	2

(R20CSE2104) Python Programming

Prerequisites: A course on “Programming for Problem Solving using C”.

Course Objectives:

- Learn Syntax and Semantics and create Functions in Python.
- Handle Strings and Files in Python.
- Understand Lists, Dictionaries and Regular expressions in Python.
- Implement Object Oriented Programming concepts in Python.
- Build Web Services and introduction to Network and Database Programming in Python.

Course Outcomes:

- Examine Python syntax and semantics and be fluent in the use of Python flow control and functions.
- Demonstrate proficiency in handling Strings and File Systems.
- Create, run and manipulate Python Programs using core data structures like Lists, Dictionaries and use Regular Expressions.
- Interpret the concepts of Object-Oriented Programming as used in Python.
- Implement exemplary applications related to Network Programming, Web Services and Databases in Python.

UNIT - I

Python Basics, Objects- Python Objects, Standard Types, Other Built-in Types, Internal Types, Standard Type Operators, Standard Type Built-in Functions, Categorizing the Standard Types, Unsupported Types

Numbers - Introduction to Numbers, Integers, Floating Point Real Numbers, Complex Numbers, Operators, Built-in Functions, Related Modules

Sequences - Strings, Lists, and Tuples, Mapping and Set Types

UNIT - II

FILES: File Objects, File Built-in Function [open()], File Built-in Methods, File Built-in Attributes, Standard Files, Command-line Arguments, File System, File Execution, Persistent Storage Modules, Related Modules

Exceptions: Exceptions in Python, Detecting and Handling Exceptions, Context Management, *Exceptions as Strings, Raising Exceptions, Assertions, Standard Exceptions, *Creating Exceptions, Why Exceptions (Now)?, Why Exceptions at All?, Exceptions and the sys Module, Related Modules
Modules: Modules and Files, Namespaces, Importing Modules, Importing Module Attributes, Module Built-in Functions, Packages, Other Features of Modules

UNIT - III

Regular Expressions: Introduction, Special Symbols and Characters, Res and Python

COMPUTER SCIENCE & ENGINEERING (CYBER SECURITY)

Multithreaded Programming: Introduction, Threads and Processes, Python, Threads, and the Global Interpreter Lock, Thread Module, Threading Module, Related Modules

UNIT - IV

GUI Programming: Introduction, Tkinter and Python Programming, Brief Tour of Other GUIs, Related Modules and Other GUIs

WEB Programming: Introduction, Web Surfing with Python, Creating Simple Web Clients, Advanced Web Clients, CGI-Helping Servers Process Client Data, Building CGI Application
Advanced CGI, Web (HTTP) Servers

UNIT - V

Database Programming: Introduction, Python Database Application Programmer's Interface (DB-API), Object Relational Managers (ORMs), Related Modules

TEXT BOOK:

1. Core Python Programming, Wesley J. Chun, Second Edition, Pearson.

REFERENCE BOOKS:

1. Think Python, Allen Downey, Green Tea Press
2. Introduction to Python, Kenneth A. Lambert, Cengage
3. Python Programming: A Modern Approach, Vamsi Kurama, Pearson
4. Learning Python, Mark Lutz, O'Really



SRI INDU COLLEGE OF ENGG & TECHNOLOGY

**LESSON PLAN
(Regulation :R20)**

(Regulation :R20)
Prepared on : 3.10.21

Department of CSE (CS)

Sub. Code & Title R20CSE2104- Python Programming

Academic Year: 2021-22 Year/Sem./Section II-I-CS

Faculty Name & Designation Ms. K.ANUSHA, ASST . 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	Introduction					18			
1.1	Python Basics	T1	1	6	Black board	03		CO1, L2	
1.2	Objects- Python Objects,	T1	8	10	Black board	01		CO1, L2	
1.3	Standard Types, Other Built-in Types,	T1	11	15	Power point presentation	02		CO1, L2	
1.5	Internal Types, Standard Type Operators,	T1	16	20	Black board	01		CO1, L2	
1.6	Standard Type Built-in Functions, Categorizing the Standard Types	T1	21	25	Black board	02		CO2, L4	
1.7	Unsupported Types Numbers - Introduction to Numbers	T1	26	35	Black board	01		CO2, L4	
1.8	Integers, Floating Point Real Numbers, Complex Numbers,	T1	36	40	Black board	01		CO2, L4	
1.9	Operators, Built-in Functions, Related Modules	T1	47	49	Black board	03		CO2, L4	
1.10	Sequences - Strings, Lists, and	T1	54	63	Black board	02		CO2, L4	
1.11	Tuples, Mapping and Set Types	T1	63	79	Black board	02		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	FILES:					22			
2.1	File Objects, File Built-in Function [open()],	R4	79	89	Black board Presentation	01		CO3, L3	



SRI INDU COLLEGE OF ENGG & TECHNOLOGY

LESSON PLAN

(Regulation :R20)

Department of CSE (CS)

(Regulation :R20)

Prepared on : 3.10.21

Sub. Code & Title **R20CSE2104- Python Programming**

Academic Year: 2021-22 **Year/Sem./Section** **II-I-CS**

Faculty Name & Designation **Ms. K.ANUSHA, ASST . PROFESSOR**

Unit/ Item No.	Topic (s)	Book Reference	Page (s)		Teaching Methodology	Proposed No. of Periods	Actual Date of Handle d	CO/RBT	
			From	To					
2.2	File Built-in Methods, File Built-in Attributes Standard Files, Command-line Arguments	T1	91	96	Black board	01		CO 3, L3	
2.3	File System, File Execution Persistent Storage Modules,	T1	114	119	Power point Presentation	04		CO 3, L3	
2.2	Related Modules Exceptions: Exceptions in Python	T1	246	256	Power point Presentation	02		CO 3, L3	
2.3	Detecting and Handling Exceptions, Context Management	T1	379	398	Black board	02		CO 3, L3	
2.4	*Exceptions as Strings, Raising Exceptions, Assertions, Standard Exceptions, * Namespaces	T1	269	278	Black board	02		CO 3, L3	
2.5	, Importing Modules, Importing Module Attributes, Module	T1	112	116	Black board	01		CO 3, L3	
2.6	Creating Exceptions, Why Exceptions (Now)?, Why Exceptions at All?,	T1	116	119	Black board	01		CO 3, L3	
2.7	Exceptions and the sys Module, Related Modules Modules: Modules and Files,	T1	89	90	Black board	03		CO 3, L3	
2.8	Built-in Functions, Packages, Other Features of Modules	T1	56	59	Seminar	05		CO 3, L3	
	Review	Signature of the HOD/Coordinator							

**UNIT-
III**

III	Regular Expressions					10		
3.1	Introduction, Special Symbols and Characters	T1	136	148	Black board	02		CO4, L6
3.2	Res and Python	T1	132	139	Black board	01		CO4, L6
3.3	Multithreaded Programming	T1	88-89	94	Black board	01		CO4, L6
3.4	Introduction, Threads and Processes	T1	143	153	Power point Presentation	02		CO4, L6
3.5	Python, Threads,	T1	96	98	Black board	02		CO4, L6

3.6	Global Interpreter Lock, Thread Module,	T1	99	106	Black board	01		CO4, L6	
3.7	Threading Module, Related Modules	T1	108	104	Black board	01		CO4, L6	
UNIT-IV									
IV	GUI Programming					16			
4.1	Introduction	T1	205	206	Black board	01		CO5, L6	
4.2	Tkinter and Python Programming	T1	22	231	Black board	02		CO5, L6	
4.3	Brief Tour of Other GUIs	T1	56	59	Black board	02		CO5, L6	
4.4	Related Modules and Other GUIs	T1	98	141	Black board	01		CO5, L6	
4.5	WEB Programming: Introduction	T1	222	226	Power point Presentation	02		CO5, L6	
4.7	Wed Surfing with Python	T1	458	489	Black board	01		CO5, L6	
4.8	Creating Simple Web Clients	T1	333	336	Black board	01		CO5, L6	
4.9	Advanced Web Clients,	T1	232	238	Black board	02		CO5, L6	
4.10	CGI-Helping Servers Process Client Data	T1	119	244	Black board	02		CO5, L6	
4.11	Building CGI Application	T1	258	310	Black board	01		CO5, L6	
4.12	Advanced CGI, Web (HTTP) Servers	T1	94	98	Black board	01		CO5, L6	
	Review	Signature of the HOD/Coordinator							
UNIT-V									
V	Database Programming,					14			
5.1	Introduction		R4	171	178	Black board	03	CO6, L6	
5.2	Python Database Application Programmer's		R4	190	201	Power point Presentation	03	CO6, L6	
5.3	Interface (DB-API),	T1	185	189	Power point Presentation	04		CO6, L6	
5.4	Object Relational Managers (ORMs)	T1	439	449	Black board	03		CO6, L6	
5.5	Related Modules	T1	178	179	Black board	01		CO6, L6	
	Review	Signature of the HOD/Coordinator							



SRI INDU COLLEGE OF ENGG & TECHNOLOGY (Regulation :R20) Department of CSE (CS)		(Regulation :R20)
Sub. Code & Title	R20CSE2104- Python Programming	
Academic Year: 2021-22	Year/Sem./Section	II-I-CS
Faculty Name & Designation	Ms. K.ANUSHA, ASST . PROFESSOR	

LIST OF TEXT BOOKS AND REFERENCES

TEXT BOOKS:

T1. Core Python Programming, Wesley J. Chun, Second Edition, Pearson.

REFERENCE BOOKS:

R1. Think Python, Allen Downey, Green Tea Press


R2. Introduction to Python, Kenneth A. Lambert, Cengage

R3. Python Programming: A Modern Approach, Vamsi Kurama, Pearson

R4. Learning Python, Mark Lutz, O'Really

LIST OF WEBLINKS

S.No.	Name Of The Topic	Website	MOOCs
1	Python Programming Essentials	Coursera	https://www.coursera.org/learn/python-programming
2	Python Data Base and Data Science	EdX	https://www.edx.org/professional-certificate/python-data-science
3	Web Programming with Python and Javascript	EdX	https://www.edx.org/course/cs50s-web-programming-with-python-and-javascript
4	Python RegX	NPTL	https://nptel.ac.in
5	Introduction to Python 3	NPTL	NOC:Python for Data Science - NPTEL https://nptel.ac.in
6	CGI programming in Python	Geeks for Geeks	https://www.geeksforgeeks.org/cgi-programming-python/
7	Beginners Python Tips	Real Python	https://realpython.com/python-beginner-tips/
8	Latest versions of Python	Python	https://www.python.org/

	SRI INDU COLLEGE OF ENGG & TECHNOLOGY (Regulation :R20) Department of CSE (CS)			(Regulation :R20)
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CONTENT BEYOND THE SYLLABUS

S.No	Topics	Proposed Actions	Date	Resource Person/Mode	POs	PSOs
1.	OOPs concepts(In Python)	To get knowledge		Dr. SR Mugunthan	PO5, PO6	PSO1,PSO2
2.	Python Programming with Data Science	To get knowledge		Mrs.A.Sruthi	PO6,PO10	PSO1,PSO2

ASSIGNMENT I&II

S.No.	Assignment Questions	Course Outcome	Books To be Referred	Date Of Announcement	Date Of Submission
1.	a)Explain the Importance of Tuple and show How the Tuple Immutable with different Examples b)Use dictionary to store antonyms of Words [eg: right,left,up,down] Ask the user to enter a words and display antonym of it	CO1	T1,T3,R4	25-10-2021	29-10-2021
2.	a)Illustrate Arithmetic, bitwise, Relational operations in Python with Example Programs b)Write a Python Program to Describe different Ways of Deleting an Element	CO1, CO4	T1,R4	25-10-2021	29-10-2021
3.	a)Create Tuple in Python And Implement Index and Count methods by taking List of Integers in Tuple b)Construct a Python Program to Calculate Area of Triangle and Circle and Print the Result .Take Input from User	CO4	T1	02-11-2021	04-11-2021
4.	a)State the Persistent Storage with its need b)Write a Python Program to define a Module to find Fibonacci Numbers and Import the Module to another Program	CO4	T1, R4	08-11-2021	10-11-2021
5.	Explain the list modules in Multi-Threading b)Write a Python Program that creates two a daemon	CO5	R4	15-11-2021	17-11-2021

	threads and two non-daemon threads main thread should wait for all other threads to finish				
6.	Write a Python Program to Match a String that contains only upper and lower case letters number and underscore using Regular Expressions	CO4	T2, R4	22-11-2021	24-11-2021
7.	Give an overview and demostartion of building Web Application using python CGI module.	CO5	R3, R4	04-01-2022	05-01-2022
8.	Write a python program that creates a GUI with a text Box, ok Button and Quit Button On clicked OK, the text entered in textbox is to be Printed in python shell on clicking Quit the program should terminate	CO6	R4	11-01-2022	13-01-2022
9.	How to use ORM in Web Application. b) Explain about GET and POST method in python.	CO5	R3, R4, T2	02-02-2022	04-02-2022
10	Describe in Detail about Python SQL Alchemy ORM with a Case Study of Employee Role Database.	CO6	R4	04-02-2022	05-02-2022



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QUESTION BANK WITH BLOOMS TAXONOMY LEVEL (BTL)

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

UNIT-1			
1 MARK QUESTIONS		BT Level	Course Outcome
1.	Discuss the features and Applications of Python	1	CO1
2.	Differentiate existing Programming and Python programming	1	CO1
3.	List some Standard data Types in Python with Examples	1	CO1
4.	Explain and Differentiate Tuple and list with its Operations.	1	CO1
5.	Write a Program to Demonstrate basic data type in Python	1	CO1
6.	What is use of dir(), function? Give some features of dictionaries	4	CO2
7.	Explain the use of join() and Spilt() string methods with Examples	1	CO2
8	Write a Python Program to multiply all items in a list?	1	CO2
9	Explain briefly about Identity and Membership Operator in Python	1	CO2
10	Demonstrate Mapping and Set Types in Python	2	CO3
11	Difference between Mutable and Immutable constraints and explain Frozen Set	1	CO1
12	Write a Python Program to Print all prime numbers less than 25	2	CO2
10 MARKS QUESTIONS			
1.	a) Define Python. List the Standard Data Types in Python b) Create a List of students and Output top three members in the list based on the marks	5	CO1
2.	a) Explain the Importance of Tuple and show How the Tuple Immutable with different Examples b) Use dictionary to store antonyms of Words [eg: right, left, up, down] Ask the user to enter a words and display antonym of it	2,5	CO1, CO2



SRI INDU COLLEGE OF ENGG & TECHNOLOGY
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3	a)Illustrate Arithmetic, bitwise, Relational operations in Python with Example Programs b)Write a Python Program to Describe different Ways of Deleting an Element from the given List	2	CO1
4.	a) Define Set and Write Example for each Method of a Set b)Write a Python Program that Interchanges The First and Last Characters of a Given String	2	CO1
5.	a)Explain about String Formatting operator with Examples b)Write a Program to Read A Word and Print the number of Letters, Vowels Percentage of vowels in the word using Dictionaries	2,5	CO1,CO2
6.	a) Write a Program to Perform different Athematic operations on Number b) What are the different Operators that can be Performed on List. Explain with Examples	3	CO1
7.	a)Create Tuple in Python And Implement Index and Count methods by taking List of Integers in Tuple b)Construct a Python Program to Calculate Area of Triangle and Circle and Print the Result .Take Input from User	1	CO2
8	a) Write a Program to Demonstrate list and Tuple in Python b) What are the 4 Built in Numeric Data Types in Python Explain	2,1	CO1,CO2
9	a)Write a Python Program to Reverse of given Number using user defined Function b)How to Work with Variables(rules and conventions for declaring a variable)and Operators in Python	4	CO2
10	a)Explain about String in Python and Write a Program Create Concatenation and Print a String and Accessing Substring from a Given String b)Explain about Keywords used in Python	2,2	CO1,CO2
11	a)Explain the List Accessing Methods and List Comprehension. b)Using Bitwise Operators a)Check given number is Even b) Check if the number is Power of 2	1,5	CO1,CO2



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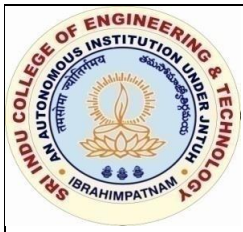
UNIT II

1 MARK QUESTIONS

1	Discuss about File Built in Functions in Python	1	CO3
2	What are the Functions to use file input and file Output	3	CO3
3	What is Exception and Explain	1	CO3
4	How to import a Module in Python explain with an Example	1	CO3
5	How are Arguments passed by value or by reference	3	CO3
6	What are the Uses of File Objects	6	CO3
7	Write a Sample Program to Raise an Exception	2	CO3
8	What is Pickling and unpickling	1	CO3
9	Explain the concept of Namespace and Scoping with an Example		
10	What is Module, built in Modules and Package in Python Given Some Examples	1	CO3
11	Mention what are the rules for local and Global variables in Python	6	CO3
12	Explain the significance of Pickle Module In Python		
13	What the few Python built in Exceptions		

10 MARKS QUESTIONS

1	a) Explain briefly Raise in Exception with Example Program b) Write a Python Script to Create a File and Open the File in Read mode and Count the Number of Words in the Given File	2	CO3
2.	a) Briefly discuss about Python Packages b) Explain about “sys” module and Assert Statement in python	2	CO3
3.	a) What are the Modules used in Python Program explain with an Example b) Write a python Program to define a Module and Import a Specific Function in that Module to another Program	6,2	CO3
4.	a) Explain about Command Line Arguments with Example b) Write a Script named copyfile.py. This script should Prompt the user for the names of two test files. The contents of the first file should be input and written to the second file	3	CO3
5.	a) Discuss about Import Statement in Detail b) Write a Program that inputs a text file. The Program should print all of the unique words in the file in Alphabetical Order	6,4	CO3



SRI INDU COLLEGE OF ENGG & TECHNOLOGY
QUESTION BANK
(Regulation :R20)
Department of CSE (CS)

(Regulation :R20)
 Prepared on 3.10.21

Sub. Code & Title **R20CSE2104- Python Programming**

Academic Year: 2021-22 **Year/Sem./Section** **II-I-CS**

Faculty Name & Designation **Ms. K.ANUSHA, ASST . PROFESSOR**

6.	a)State the Persistent Storage with its need b)Write a Python Program to define a Module to find Fibonacci Numbers and Import the Module to another Program	2	CO3
7.	a)What is Module and How to Structure a Program b)How to Import Modules from 2 Different Packages	2	CO3
8	a)Give a Brief description of Several Built in Attributes Related to File Objects b)Explain How Package are Utilized in Python Explain With suitable Program	5	CO3
9	Elaborate the Concept of Exception and Explain 6 types of Exception with suitable Example Program	2	CO3
10	a)How to Handle Exception Using Try , Except block Explain with the help of Program	6	CO3

Unit -III :

1 MARK QUESTIONS

1.	Explain about Special symbols and characters in a regular expression in python	1	CO4
2.	Illustrate Differentiate between Process and Threads.	1	CO4
3	Write short notes on Global Interpreter Lock	1	CO4

4	Discuss about Thread, Multi-Threading and its modules.	2	CO4
5	Describe about multithreaded programming in python and Explain 2 Modules supported for Multithreading	1	CO4
6	Brief about “Re” Module and MetaCharacters	1	CO4
7	Differentiate matching and searching in python regular Expression	2	CO4
8	Explain How Regular Expressions are Compiled in Python Programming Language	1	CO4
9	How to Use ThreadPoolExecutor In Python	2	CO4
10	Give Some Regular Expression Methods[match, search , findall , spilt,sub]	1	CO4

10 MARKS QUESTIONS

1.	What are Regular Expression ?How to find whether an Email Id entered by user is valid or not using Python module	2	CO4
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2	a)Explain briefly about Thread and Threading Module in Python with Example b) What are DAEMON Threads	5,5	CO4
3.	a)Explain Synchronizing of Thread b)Explain Impact of GIL on Multi Thread Programming	3	CO4
4	What is Multi-Threading and Discuss about Starting a new Thread	2	CO4
5.	a)Write a Python Program for Phone Number Verification Using Regular Expressions b)List some advantages and Disadvantages of Multi-Threading Programming in Python	2,6	CO4
6	a)Explain The Characteristics of Process b)Write a Python Program that creates two a daemon threads and two non-daemon threads main thread should wait for all other threads to finish	3	CO4
7.	Write a Program to Split a String where there is a Match and Return a List of String when there is a Split	2	CO4
8.	Write a Python Program to Match a String that contains only upper and lower case letters number and underscore using Regular Expressions	2	CO4
9.	Write a Program to Print Thread name and Corresponding Process for each task	4	CO4
10.	Write a Program to Demonstrate race Condition Between Thread in Python	2	CO4


Unit-IV :

1 MARK QUESTIONS

1	Explain in detail Web Surfing with Python	1	CO5
2	Write a Program by using the Tkinter Module	1	CO5
3	What is Tkinter, Mention atleast three Widgets Supported in Tkinter	1	CO5
4	Explain about label ,list Box and Menu button Widget in Python	1	CO5
5	How does GUI Programming Work in Python	1	CO5
6	How to Create Simple Web Client and Explain in Python	1	CO5
7	Name the Radio Buttons and Check Button functions in python	2	CO5
8	Explain how a CGI application is created in Python	1	CO5
9.	How does CGI helps in handling and Processing the data	2	CO6
10	What is HTTP?Write a Simple Program to list all CGI variables	1	C06
11	Write a Simple Program for making GET,POST request	2	C05
12	How to Setup cookies in Browser		

10 MARKS QUESTIONS

	10 MARKS QUESTIONS		
1	Write a python program that creates a GUI with a text Box, ok Button and Quit Button On clicked OK, the text entered in textbox is to be Printed in python shell on clicking Quit the program should terminate	1	CO6
2	How to create Label Widget in python. b)What Is CGI explain in detail	2	CO6
3	Consider a python GUI program that produces a window with the following widgets using python code. A button to retrieve the next value in that list(if there is one) this button is displayed if there is no next value in the list	4	CO6
4	Consider a python GUI program that produces a window with the following widgets using python code A label to display the number of items being displayed and the total number items	4	CO6
5	Give an overview and demonstration of building Web Application using python CGI module.	1	CO6
6	Write a program for basic Web Browser using tkinter which should have a text widget wher the user can enter a URL and a canvas to display the contents pf the page	1	CO6
7	Explain about Radio button widget in TKinter .how to create Two radiobutton sets(one for gender and another for Indian or not)on the same canvas.	3	CO6
8	Generate simple registration form using python	6	CO6
9	Explain Web Surfing with Python. b)Explain pack ()and place() method of TKinter.	1	CO6
10	Explain TKinter Geometry. b)Explain the steps to Create Widgets in python.	1	CO6
	Unit-V :		
	1 MARK QUESTIONS	1	CO6
1	Explain about Python Databases and how they are created.	4	CO6
2	List out the various Python database API.	2	CO6
3	How database connectivity is established in Python.	6	CO6
4	Describe the creation of an employee database in python.	1	CO6
5	What are the different operations that are performed on a database using python.	2	CO6
6	Discuss the various syntax errors generated in databases in Python.	1	CO6
7	Explain about DB-API in Python.	3	CO6
8	Summarize about object relational mangers in Python.	2	CO6
9	Explain cursor objects in python	3	CO6
10	Explain error and Exception handling in DBAPI.	3	CO6

	SRI INDU COLLEGE OF ENGG & TECHNOLOGY QUESTION BANK (Regulation :R20) Department of CSE (CS)		(Regulation :R20) Prepared on 3.10.21
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10 MARKS QUESTIONS

1	Explain SQL Alchemy and Database Operations in python.	3	CO3
2	Demonstrate Python with MySQL using a program.	1	CO3
3	Explain Error and Exception Handling in DBAPI.	3	CO3
4	Develop Simple Database Application Programmers Interface	6	CO3
5	Create an Employee Table and find out all Employee names whose Salary is more than 1000.	6	CO3
6	Differentiate between Operation error and Programming error in DBAPI.	2	CO5
7	Implement Python Django's ORM.	3	CO5
8	How to use ORM in Web Application. b) Explain about GET and POST method in python.	1,3	CO5
9	Explain various Method and Attributes of Cursor Object.	3	CO5
10	Describe in Detail about Python SQL Alchemy ORM with a Case Study of Employee Role Database.	2	CO5

END EXAMINATION- MODEL PAPER

BR-20

D4

Subject Code: R20CSE2104

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 –End Examinations (Model paper)

Python Programming

Duration: 3 Hrs

Max Marks: 70M

SECTION – A

Answer ALL the following questions

(Marks

5*4=20M)

1. State any four applications where python is more popular.
2. List out the main differences between lists and tuples.
3. What are the uses of File object?
4. Give a brief description of several Built-in attributes related to File objects.
5. Summarize the purpose of pipe and dot symbols used for pattern matching.

SECTION – B

Answer any FIVE questions choosing at least one from each Unit

(5*10=50 Marks)

UNIT 1

- 6.a) How to declare and call functions in Python programs? Illustrate with an example script.
- b) List and explain few most commonly used built-in types in python.

OR

7. Summarize various operators, built-in functions and standard library modules that deals with Python's numeric type.

UNIT II

8. Explain the following file built-in functions and method with clear syntax, description and illustration:
a) open() b) file() c) seek() d) tell() e) read()

OR

- 9.a) How does try-except statement work? Demonstrate with an example python code.
- b) Illustrate the concept of importing module attributes in python scripts.

UNIT III

10. Examine how python supports regular expressions through the 're' module with brief introduction and various built-in methods related to it.

OR

- 11.a) What is the motivation behind parallelism and state how python achieves parallelism?
- b) Explain briefly about thread and threading module objects in Python.

UNIT IV

12. Consider a Python GUI program that produces a window with the following widgets using python code:

- a) A button to retrieve the next value in that list(if there is one). This button is displayed if there is no next value in the list
- b) A label to display the number of the items being displayed and the total number of items

OR

13. Give an overview and demonstration of building web applications using python's cgi module.

UNIT V

- 14.a) What is a cursor object? Explain various methods and attributes of cursor object.
- b) What do you mean by a constructor? List and describe various constructors used for converting to different data types.

OR

15. Describe in detail about Python SQLAlchemy ORM with a case study of Employee role database.

MID I MODEL PAPER
SRI INDU COLLEGE OF ENGINEERING & TECHNOLOGY
(An Autonomous Institution Under UGCAct 1956,New Delhi)
II B.Tech -I Semester –I Mid Term Examinations
(R20CSE2104)- Python Programming

Department of CSE(AI&ML)

Duration: 90Mins

Max Marks:25M

Section-A

Marks:5*1=5

Answer All the questions

1. Discuss the features and Applications of Python.
2. How to open a new file in python and how the write method works on a file?
3. What is Regular Expression?
4. What is GUI Programming and Explain the uses of GUI in python?
5. List out the various Python database API.

Section-B

Answer any FOUR Questions

Marks:4*5=20M

- 6.a. Define python ?List the standard data type of python?
b. Create a list of students and output top three members in the list based on marks
- 7a . Explain about handling an exception?
b. What is module and how to structure a program?
8. write python program for phone number verification using regular expressions?
- 9 .What is Tkinter module in python and explain its need?
- 10 .Explain SQL Alchemy and Database Operations in python.
11. Implement Python Django's ORM.

MID II MPODEL PAPER

SRI INDU COLLEGE OF ENGINEERING & TECHNOLOGY
(An Autonomous Institution Under UGCAct 1956,New Delhi)
II B.Tech -I Semester –II Mid Term Examinations
(R20CSE2104)- Python Programming
Department of CSE(AI&ML)

Duration: 90Mins

MaxMarks:25M

Section-A

Marks:5*1=5

Answer All the questions

1. Discuss the features and Applications of Python.
2. How to open a new file in python and how the write method works on a file?
3. What is Regular Expression?
4. What is GUI Programming and explain the uses of GUI in python?
5. List out the various Python database API.

Section-B

Answer any FOUR Questions

Marks:4*5=20M

- 6 a) Define python? List the standard data type of python?
b) Create a list of students and output top three members in the list based on marks
- 7 a) Explain about handling an exception?
b) What is module and how to structure a program?
8. Write python program for phone number verification using regular expressions?
9. What is Tkinter module in python and explain its need?
10. Explain SQL Alchemy and Database Operations in python.
11. Explain Error and Exception Handling in DBAPI.