



Sri Indu

College of Engineering & Technology

UGC Autonomous Institution

Recognized under 2(f) & 12(B) of UGC Act 1956,
NAAC, Approved by AICTE &
Permanently Affiliated to JNTUH



NAAC
NATIONAL ASSESSMENT AND
ACCREDITATION COUNCIL



HANDOUT

II Year I Semester

DEPARTMENT OF AI&ML

ACADEMIC YEAR 2025-2026



SRI INDU COLLEGE OF ENGINEERING & TECHNOLOGY

D4

(An Autonomous Institution Under UGC, New Delhi)

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Sheriguda(V), Ibrahimpatnam, R.R. Dist, Telangana State - 501510



DEPARTMENT OF AI&ML

HANDOUT-INDEX

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VISION OF THE INSTITUTE

To be a premier institution in engineering & technology and management for competency, values and social consciousness.

MISSION OF THE INSTITUTE

- IM1:** Provide high quality academic programs, training activities and research facilities.
- IM2:** Promote continuous industry-institute interaction aimed at promoting employability, entrepreneurship, leadership and research aptitude among stakeholders.
- IM3:** Contribute to the economic and technological development of the region, state and nation.

DEPARTMENT VISION

To develop competent engineers in the domain of Artificial Intelligence & Machine Learning for noteworthy contributions to the society

DEPARTMENT MISSION

- DM1:** To strengthen academic collaborations for better exposure.
- DM2:** Promote professional environment to imbibe ethical values and entrepreneurial skills
- DM3:** Encourage research & development by emphasizing on innovation
- DM4:** Facilitate Industry-Institute collaboration for mutual benefit

PROGRAM EDUCATIONAL OBJECTIVES(PEOs)

- PEO1:** Generate contributions towards advancements in Artificial Intelligence and Machine Learning.
- PEO2:** Promote design, research and implementation of products through strong communication skills, leadership and entrepreneurial skills.
- PEO3:** Apply basic principles and practices of AIML to successfully complete software related projects to meet customer business objectives and/or productively engage in research.

Program Outcomes(POs)

PO1	Engineering Knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO2	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.
PO3	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.
PO4	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.
PO5	Engineering tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling recognizing their limitations to solve complex engineering problems.(WK2 and WK6).
PO6	The Engineer and The World: Analyze and evaluate societal and environmental aspects while solving complex engineering problems for its impact on sustainability with reference to economy, health, safety, legal framework, cultural and environment. (WK1, WK5 and WK7).
PO7	Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO8	Individual and Collaborative Team Work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO9	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.
PO10	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.
PO11	Life-long 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's)

PSO1	Register mathematical methodology to crack problems using suitable data structures.
PSO2	Competence to design and develop software for web based and mobiles androids under real world environment.
PSO3	Skill to design the algorithms for machine learning, data compression can be used in different applications.

COURSE OUTCOMES (CO's)

Academic Year: 2025-26

Class : II YEAR-I SEM.

Course Name : OPERATING SYSTEMS

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

C215.1	Define the functions, structures and history of operating systems and able to analyze the design issues associated with operating systems. (Remember)
C215.2	Demonstrate various process management concepts, evaluates various CPU scheduling algorithms and illustrate the process synchronization concepts with various examples. (Apply)
C215.3	Evaluate the problems related to deadlocks, classify resources sharing among the users to avoid deadlocks, design the Deadlock detection and Prevention Algorithms. (Evaluate)
C215.4	Describe the concepts of memory management including virtual memory, can compare various page replacement algorithms(Understand)
C215.5	Illustrate File Management, analyses different File Allocation Strategies, develop disk Scheduling Algorithms.(Apply)
C215.6	Using system protection and Revocation of access rights.(Analyze)

COURSE ARTICULATION MATRIX

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3
C223.1	3	2	-	-	-	-	-	-	-	-	2	3	3	-
C223.2	3	3	3	-	-	-	-	-	-	-	-	3	2	-
C223.3	3	2	3	3	-	-	-	-	-	-	2	3	2	-
C223.4	3	2	3	3	-	-	-	-	-	-	2	3	3	-
C223.5	3	-	2	2	3	-	-	-	-	-	2	3	3	-
C223.6	3	-	-	-	3	-	-	-	-	-	-	3	3	-
C223	3	1.5	1.8	1.3	1	-	-	-	-	-	1.3	3	2.7	-

INSTITUTION ACADEMIC CALENDAR



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

D4

ANNEXURE -III

BR-22

Lr.No.SICET/AUTO/DAE/II^o B.Tech Academic Calendar/30/2025

B.TECH II-YEAR I-SEM & II-SEM ACADEMIC CALENDAR **(FOR ACADEMIC YEAR : 2025-26)**

Academic Calendar for B.Tech – IInd Year Students (2024 - 25 Batch), BR-22 Regulation.

I – Semester

S.No.	EVENT	PERIOD	DURATION
1.	Commencement of class work.	01.08.2025 (Monday)	
2.	1 st Spell of Instructions for covering First Two and a half Units.	01.08.2025 – 07.10.2025	9 Weeks
3.	I Mid Term Examinations.	08.10.2025 – 10.10.2025	3 Days
4.	Submission of I Mid Term Examination Marks.	16.10.2025	
5.	2 nd Spell of Instructions for Remaining Two and a half Units.	13.10.2025 – 13.12.2025	9 Weeks
6.	II Mid Term Examinations.	15.12.2025 – 17.12.2025	3 Days
7.	Preparation Holidays and Practical Examinations	18.12.2025 – 27.12.2025	1 Week
8.	Submission of II Mid Term Examination Marks.	23.12.2025	
9.	I Semester End Examinations.	29.12.2025 – 10.01.2026	2 Weeks
Commencement of Class-Work for II B.Tech - II Semester 19.01.2026			

Note: No of Working/instructional days : 92

II – Semester

S.No.	EVENT	PERIOD	DURATION
1.	Commencement of class work.	19.01.2026 (Monday)	
2.	1 st Spell of Instructions for covering First Two and a half Units.	19.01.2026 – 14.03.2026	8 Weeks
3.	I Mid Term Examinations.	16.03.2026 – 18.03.2026	3 Days
4.	Submission of I Mid Term Examination Marks.	24.03.2026	
5.	2 nd Spell of Instructions for Remaining Two and a half Units.	20.03.2026 – 09.05.2026	7 Weeks
6.	Continuation of remaining 2 nd Spell of Instructions	25.05.2026 – 10.06.2026	2 Weeks
7.	II Mid Term Examinations.	11.06.2026 – 13.06.2026	3 Days
8.	Preparation Holidays and Project Evaluation.	15.06.2026 – 20.06.2026	1 Week
9.	Submission of II Mid Term Examination Marks.	18.06.2026	
10.	II Semester End Examinations	22.06.2026 – 04.07.2026	2 Weeks

Note: No of Working/instructional days : 92

ACE

CE

DIRECTOR

PRINCIPAL

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

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

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

Sign:

Dr. M.V.S.S. Giridhar

Prof. of CEA; JNTUH Nominee

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

Sign:

Dr. T. Venu Gopal

Prof. of CSE; JNTUH Nominee

Sign:

Dr. D. Ramesh

Prof. of CSE; JNTUH Nominee



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DEPARTMENT ACADEMIC CALENDAR

SUNDAY					SEPTEMBER					DECEMBER		
MONDAY		JULY		1	IV-IMIDIEXAMS					1	IV-IENDEXAMS	
TUESDAY	1	DEPARTMENT MEETING FOR IV-I&III-12025-2026		2	IV-IMIDIEXAMS		OCTOBER			2	IV-IENDEXAMS	
WEDNESDAY	2			3	IV-IMIDIEXAMS	1	III-ICRTCLASSESS			3	IV-IENDEXAMS	JANUARY
THURSDAY	3		AUGUST	4	IV-ISPELL2CLASSES	2	GANDHIJAYANTI & DASHA RA			4	IV-IENDEXAMS	1
FRIDAY	4		II-ISPELLCLASSESS COMMENCEMENT	5		3	III-ICRTCLASSESS		NOVEMBER	5	IV-IENDEXAMS	2
SATURDAY	5		DEPARTMENT MEETING	6		4	III-ICRTCLASSESS	1	WOKSHOP UNDER AILUB	6	IV-IENDEXAMS	3
SUNDAY	6			7		5		2		7		4
MONDAY	7	IV-ISPELLCLASSES COMMENCEMENT		8		6	III-ICRTCLASSESS	3		8	IV-IENDEXAMS	5
TUESDAY	8			9		7	III-ICRTCLASSESS	4		9	IV-IENDEXAMS	6
WEDNESDAY	9			10	IV-IMIDIEXAMS SUBMISSION	8	III-IMIDIEXAMS & II-IMIDIEXAMS	5		10	IV-IENDEXAMS	7
THURSDAY	10			11		9	III-IMIDIEXAMS & II-IMIDIEXAMS	6		11	IV-IENDEXAMS	8
FRIDAY	11			12	DEPARTMENT MEETING REVIEW ON IV-ISLOW LEARNERS	10	III-IMIDIEXAMS & II-IMIDIEXAMS	7		12	IV-IENDEXAMS	9
SATURDAY	12	AILUB MEETING	WOKSHOP UNDER AILUB	13	AILUB MEETING	11		8		13	IV-IENDEXAMS	10
SUNDAY	13			14		12		9		14		11
MONDAY	14	III-ISPELLCLASSES COMMENCEMENT		15	III-ICRTCLASSESS	13	II-I&III-ISPELL2CLASSES	10		15	II-I&III-IMIDIEXAMS	12
TUESDAY	15			16	III-ICRTCLASSESS	14		11		16	II-I&III-IMIDIEXAMS	13
WEDNESDAY	16			17	III-ICRTCLASSESS	15		12		17	II-I&III-IMIDIEXAMS	14
THURSDAY	17			18	III-ICRTCLASSESS	16	II-I&III-IMIDIE MARKS SUBMISSION	13		18	II-I&III-IMIDIE MARKS SUBMISSION	15
FRIDAY	18		INDEPENDENCE DAY	19	III-ICRTCLASSESS	17	DEPARTMENT MEETING REVIEW ON III-I& II-ISLOW LEARNERS	14		19	II-I & III-IPREPARATION & PRACTICAL EXAMS	16

SATURDAY	19		16		20	III-ICRTCLASSESS	18	AICLUBMEETING	15		20	II-I&III-I PREPARATIO N&PRACTICA LEXAMS	17	
SUNDAY	20		17		21	BATHUKAMMA	19		16		21		18	
MONDAY	21	BONALUHOLIDAY	18		22	III-ICRTCLASSESS	20	DIWALI	17		22	II-I&III-I PREPARATIO N&PRACTICA LEXAMS	19	
TUESDAY	22		19		23	III-ICRTCLASSESS	21		18		23	II-I&III-I IMIDIIMARKSS UBMISSION III- IPREPARATION &PRACTICAL EXAMS	20	
WEDNESDAY	23		20		24	III-ICRTCLASSESS	22		19	IV-IMIDIEXAMS	24	II-I&III-I PREPARATIO N&PRACTICA LEXAMS	21	
THURSDAY	24		21		25	III-ICRTCLASSESS	23		20	IV-IMIDIEXAMS	25	CHRISTMASDAY	22	
FRIDAY	25		22		26	III-ICRTCLASSESS	24		21	IV-IMIDIEXAMS	26	II-I&III-I PREPARATIO N&PRACTICA LEXAMS	23	
SATURDAY	26		23		27	GANESH CHATURTHI	25	DEPARTMENTMEETING	22	AICLUBMEETING	27	II-I&III-I PREPARATIO N&PRACTICA LEXAMS	24	
SUNDAY	27		24		28		26		23		28		25	
MONDAY	28	DEPARTMENTMEETINGFORIIYR 2025-2026	25		29	III-ICRTCLASSESS	27		24	IV- IPREPARATION &PRACTICALE XAMS	29	II-I&III- IENDEX AMS	26	
TUESDAY	29		26		30	III-ICRTCLASSESS	28		25	IV- IPREPARATION &PRACTICALE XAMS	30	II-I&III- IENDEX AMS	27	
WEDNESDAY	30		27				29		26	IV- IPREPARATION &PRACTICALE XAMS	31	II-I&III- IENDEX AMS	28	
THURSDAY	31		28				30		27	IV- IPREPARATION &PRACTICALE XAMS			29	
FRIDAY			29				31		28	IV- IPREPARATION &PRACTICALE XAMS			30	
SATURDAY			30	AICLUBMEETING		WOKSHOPUNDERAILUB			29	IV- IPREPARATION &PRACTICALE XAMS			31	
SUNDAY			31						30					

OPERATING SYSTEMS

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

(R22CSE2213) OPERATING SYSTEMS

Course Objectives:

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

Course Outcomes:

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

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

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

UNIT – II : CPU Scheduling - Scheduling Criteria, Scheduling Algorithms, Multiple -Processor Scheduling. System call interface for process management-fork, exit, wait, waitpid, exec

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

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

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

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

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

TEXT BOOKS:

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

REFERENCE BOOKS:

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



SRI INDU COLLEGE OF ENGINEERING & TECHNOLOGY
LESSON PLAN
(Regulation :R22)
Department of AI&ML

**Prepared
on
2025**

Sub. Code & Title	R22CSE2213 - Operating Systems
Academic Year: 2025-26	Year/Sem./Section II/I
Faculty Name & Designation	Mr. Ch PraveenReddy & Assistant. Professor

Unit/ Item No.	Topic (s)	Book Reference	Page (s)		Teaching Methodology	Proposed No. of Periods	Actual Date of Handled	CO/RBT
			From	To				
UNIT-I8								
1.1	Operating System Introduction	T1	3	6	Black Board	01		CO1,RB1
1.2	OS Structure –Simple Batch	T1	18	19	Black Board	01		CO1,RB2
1.3	Multi programmed, Time shared	T1	19	20	Presentatio n	01		CO1,RB2
1.4	Personal Computer, Parallel System	T1	13	16	Black Board	01		CO1,RB2
1.5	Distributed Systems, Real- Time	T1	30	33	Black Board	01		CO1,RB2
1.6	System Components	T1			Black Board	01		CO1,RB1
1.7	Operating System services	T1	49	52	Black Board	01		CO1,RB2
1.8	System Calls	T1	55	58	Black Board	01		CO1,RB1
	Review	Signature of the HOD/Coordinator						

	SRI INDU COLLEGE OF ENGINEERING & TECHNOLOGY			Prepared on 2025
	LESSON PLAN			
	(Regulation :R22)			
	Department of AI&ML			
Sub. Code & Title	R22CSE2213 - Operating Systems			
Academic Year :2025-26	Year/Sem./Section	II/I		
Faculty Name & Designation	Mr. Ch PraveenReddy & Assistant. Professor			

Unit/ Item No.	Topic (s)	Book Reference	Page (s)		Teaching Methodolog y	Propose d No. of Periods	Actual Date of Handled	CO/RBT
			From	To				
UNIT-II								
2.1	Process and CPU Scheduling - Process concepts	T1	101	104	Black Board	01		CO2,RB2
2.2	Process Scheduling	T1	105	110	Black Board	02		CO2,RB1
2.3	Operation on Processes	T1	110	115	Black Board	01		CO2,RB1
2.4	Cooperating Process	T1	116		Black Board	01		CO2,RB1
2.5	Thread	T1	104	105	Black Board	01		CO2,RB2
2.6	Inter Process Communication	T1	116	122	Presentation	02		CO2,RB2
2.7	Scheduling Criteria	T1	187	188	Black Board	01		CO2,RB2
2.8	Scheduling algorithms	T1	188	198	Black Board	04		CO2,RB5
2.9	Multiple-Processor Scheduling	T1	200	206	Presentation	01		CO2,RB3
2.10	System call Interface for process management- fork,exit,wait,waitpid,exec	T1	812	814	Black Board	02		CO2,RB3
2.11	Deadlocks - System Model	T1	283	284	Black Board	01		CO2,RB2
2.12	Deadlock Characterization	T1	285	289	Presentation	01		CO2,RB1
2.13	Methods for Handling Deadlocks	T1	290	291	Black Board	01		CO2,RB4
2.14	Deadlock Prevention	T1	291	294	Chart	01		CO2,RB3
2.15	Deadlock Avoidance	T1	294	300	Black Board	01		CO2,RB4
2.16	Deadlock Detection and Recovery from Deadlock	T1	301	305	Black Board	01		CO2,RB5

Unit/ Item No.	Topic (s)	Book Referenc e	Page(s)		Teaching Methodolog y	Propos ed No. of Period s	Actua l Date of Hand led	CO/RBT
			From	To				

UNIT III

3.1	Process Synchronization	T1	225	227	Black Board	01		CO3,RB1
3.2	The Critical section Problem	T1	227	229	Black Board	01		CO3,RB3
3.3	Synchronization Hardware	T1	231	234	Black Board	01		CO3,RB2
3.4	Semaphores	T1	234	239	Black Board	01		CO3,RB1
3.5	Classic Problems of Synchronization	T1	239	244	Black Board	02		CO3,RB4
3.6	Critical Region ,Monitors	T1	244	252	Black Board	01		CO3,RB1
3.7	IPC on single Computer	T1	122	127	Presentation	01		CO3,RB2
3.8	IPC Mechanisms using pipes,FIFO	T1	128	139	Black Board	01		CO3,RB3
	Review	Signature of the HOD/Coordinator						

		SRI INDU COLLEGE OF ENGINEERING & TECHNOLOGY						Prepared on 2025	
		LESSON PLAN							
		(Regulation :R22)							
		Department of AI&ML							
Sub. Code & Title			R22cse2213 - Operating Systems						
Academic Year: 2025-26			Year/Sem./Section		II/I				
Faculty Name & Designation			Mr. Ch PraveenReddy & Assistant Professor						
Unit/ Item No.	Topic (s)	Book Reference	Page (s)		Teaching Methodology	Proposed No. of Periods	Actual Date of Handled	CO/RBT	
			From	To					
UNIT-IV									
10									
4.1	Logical & physical Address Space	T1	318	320	Black Board	01		CO4,RB2	
4.2	Swapping	T1	322	324	Black Board	01		CO4,RB1	
4.3	Contiguous Allocation	T1	324	328	Black Board	01		CO4,RB2	
4.4	Paging	T1	328	337	Black Board	02		CO4,RB2	
4.5	Segmentation, Segmentation with Paging	T1	344	345	Black Board	01		CO4,RB4	
4.6	Demand Paging	T1	361	366	Black Board	01		CO4,RB2	
4.7	Page Replacement	T1	369	372	Presentation	01		CO4,RB5	
4.8	Page Replacement Algorithms	T1	373	380	Black Board	02		CO4,RB3	
	Review	Signature of the HOD/Coordinator							



SRI INDU COLLEGE OF ENGINEERING & TECHNOLOGY LESSON PLAN (Regulation :R22) Department of AI&ML		Prepared On 2025
Sub. Code & Title	R22cse2213 - Operating Systems	
Academic Year: 2025-26	Year/Sem./Section	II/I
Faculty Name & Designation	Mr. Ch PraveenReddy & Assistant. Professor	

Unit/ Item No.	Topic (s)	Book Reference	Page (s)		Teaching Methodology	Proposed No. of Periods	Actual Date of Handled	CO/RBT
			From	To				
UNIT-V					10			
5.1	File System Interface and Operation	T1	430	433	Black Board	01		CO5,RB2
5.2	Access methods	T1	434	437	Black Board	01		CO6,RB1
5.3	Directory Structure	T1	438	444	Presentation	01		CO5,RB3
5.4	Protection	T1	451	456	Black Board	02		CO6,RB3
5.5	File System Structure	T1	461	463	Chart	01		CO5,RB3
5.6	Allocation methods	T1	471	478	Black Board	01		CO5,RB4
5.7	Free-space Management	T1	479	482	Black Board	02		CO5,RB2
5.8	Usage of open,read,write,close,lseek, stat,ioc tl system calls	T1	424	425	Black Board	01		CO1,RB3
	Review	Signature of the HOD/Coordinator						

	SRI INDU COLLEGE OF ENGINEERING & TECHNOLOGY			Prepared On 2025
	LESSON PLAN (Regulation :R22) Department of AI&ML			
	Sub. Code & Title	R22cse2213 - Operating Systems		
	Academic Year: 2025-26	Year/Sem./Section	II/I	
Faculty Name & Designation	Mr. Ch PraveenReddy & Assistant. Professor			

LIST OF TEXT BOOKS AND REFERENCE

TEXT BOOKS:

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

REFERENCE BOOKS:

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

Web links

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

SELF STUDY TOPICS			
S.No	Topics	Books & Journals	Course Outcome
1	Memory Management	Operating systems - Internals and Design Principles, W. Stallings, 6th Edition, Pearson.	CO3
2	File Systems	Operating systems - Internals and Design Principles, W. Stallings, 6th Edition, Pearson.	CO5

CONTENT BEYOND THE SYLLABUS

S.No	Topics	Proposed Actions	Date	Resource Person/Module	Pos	PSOs
1	Mobile Operating Systems(like Android, ios)				PO1,PO2,PO3	PSO1,PSO2
2	Distributed Operating System				PO1,PO2,PO3	PSO1,PSO2



SRI INDU COLLEGE OF ENGINEERING & TECHNOLOGY

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DEPARTMENT OF AI&ML

YEAR/SEMESTER: II YEAR/I SEM/ AI&ML

A.Y:2025-26

SUBJECT:(R22CSE2213)

OPERATING SYSTEMS

ASSIGNMENT-I

Batch. No	Assignment Questions	Register Number	Course outcome	BT Level
1.	1.Explain stateIPCparadigmsandimplementations. 2. Brieflyexplainaboutsegmentation? 3. Whatispaging?Explainthebasicmethodforimplementi ng paging 4. Explainthethreeallocationmethodsinfilessystem implementation? Illustrate with proper diagram. 5. Explaini)Filesharingii)Protection.	24D41A6601	CO4	I
		to	CO5	I
		24D41A6605	CO5	
			CO6	I
			C06	I
				I
				I
				I
				I
				I

2.	1. What are the models of IPC? Explain it. 2. Consider the following reference string 7,0,1,2,0,3,0,4,2,3,0,3,2,1,2,0,1,7,0,1. Assume there are three frames. Apply LRU replacement algorithm to the reference string above and find out how many page faults are produced. Illustrate the LRU page replacement algorithm in detail and also two feasible implementations of the LRU algorithm 3. Describe about a) Contiguous memory allocation b) Fragmentation 4. What are the advantages and disadvantages of free space management? 5. Draw the diagram for tree-structured directories and explain it.?	24D41A6606 to 24D41A6610	CO4	I
			CO5	I
				I
				I
			CO5	
			CO6	
			CO6	I
				I
				I
				I
3.	1. What is the use of pipes? Explain with an example? 2. Illustrate about allocation of frames. 3. Explain FIFO page replacement algorithm necessary reference string? Consider the following reference string 7,0,1,2,0,3,0,4,2,3,0,3,2,1,2,0,1,7,0,1. 4. Explain various system calls for file management system?	24D41A6611 to 24D41A6615	CO4	I
			CO5	I
			CO5	I
			CO6	I
				I
				V
				I
				I
	5. What are the advantages and disadvantages of free space management?		CO6	I
4.	1. Explain the concept of Inter-Process Communication Mechanisms with an example? 2. Explain LRU page replacement algorithm with an example. 3. Explain the various page replacement strategies	24D41A6616 to 24D41A6620	CO4	I
			CO5	I
			CO5	
				I
				I

	4. What is a file? List the various file attributes and file operations? 5. Consider the following disk queue with requests for I/O to blocks on cylinders 98,183,37,122,14,124,65,67 in that order, using FCFS algorithm. If the disk head is initially at cylinder 53, find the total head movement in cylinders. Also provide the necessary diagram to show the head movement for the above queue.		CO6 C06	I I V
5.	1. Difference between Message queue and Shared memory? 2. What is demand paging and what are its uses? 3. Write about the techniques for structuring the page table. 4. Explain swap-space management. 5. Explain disk structure and disk scheduling.	24D41A6621 to 24D41A6625	CO4 CO5 CO5 CO6 C06	I I I I I I I I
6.	1. Explain use of message passing & semaphore for inter process communication? 2. Explain about page replacement algorithms? 3. How can the system distinguish between the pages that are in main memory from the pages that are on the disk? 4. Discuss about the access rights and management simultaneous access. 5. Explain disk structure and disk scheduling.	24D41A6626 To 24D41A6630	CO4 CO5 CO5 CO6 C06	I I I I I I I I
7.	1. Explain the concept of IPC between processes on different system? 2. What are the advantages and disadvantages of page replacement algorithms? 3. What are the differences between? a) Logical and physical address? b) Page table and segment table? c) First-fit placement and best-fit placement? 4. Explain in detail the four approaches to free-space management? 5. Consider the following disk queue with requests for I/O to blocks on cylinders 98,183,37,122,14,124,65,67 in that order, using FCFS algorithm. If the disk head is initially at cylinder 53, find the total head movement in cylinders. Also provide the necessary diagram to show the head movement for the above	24D41A6631 to 24D41A6635	CO4 CO5 CO5 CO6 C06	I I I I I I

	queue.			V
8.	1. Explain the concept of IPC between processes on a single system? 2. What is demand paging and what are its uses? 3. Write about the techniques for structuring the page table.	24D41A6636 to 24D41A6640	CO4 CO5 CO5	I I I I
	4. Explain various system calls for file management system? 5. Explain in detail the four approaches to free-space management?		CO6 C06	I I I I
9.	1. Explain use of message passing & semaphore for inter process communication? 2. Explain about page replacement algorithms? 3. How can the system distinguish between the pages that are in main memory from the pages that are on the disk? 4. Explain in detail the four approaches to free-space management? 5. Draw the diagram for tree structured directories and explain it.?	24D41A6641 to 24D41A6645	CO4 CO5 CO5 CO6 C06	I I I I I I I

10.	1. Explain the concept of Inter Process Communication Mechanisms with an example? 2. What are the differences between? a) Logical and physical address? b) Page table and segment table? c) First-fit placement and best-fit placement? 3. What is paging? Explain the basic method for implementing paging. 4. What are the advantages and disadvantages of free space management? 5. Explain about access methods?	24D41A6646 to 24D41A6650	CO4	I
			CO5	I
			CO5	I
			CO6	
			CO6	I
11.	1. What are the models of IPC? Explain it. 2. Consider the following reference string 7,0,1,2,0,3,0,4,2,3,0,3,2,1,2,0,1,7,0,1. Assume there are three frames. Apply LRU replacement algorithm to the reference string above and find out how many page faults are produced. Illustrate the LRU page replacement algorithm in detail and also two feasible implementations of the LRU algorithm. 3. What are the advantages and disadvantages of page replacement algorithms? 4. Explain i) File sharing ii) Protection. 5. Draw the diagram for tree-structured directories and explain it.	24D41A6651 to 24D41A6655	CO4	I
			CO5	I
				I
			CO5	I
			CO6	
12.	1. Difference between Message queue and Shared memory? 2. Write about the techniques for structuring the page table. 3. Difference between segmentation, paging and demand paging with an example? 4. Explain the three allocation methods in file system implementation? Illustrate with proper diagram. 5. What is a file? List the various file attributes and file operations?	24D41A6660 to 24D41A6665	CO4	I
			CO5	I
			CO5	
			CO6	I
			CO6	V
				I

				I
				I
13.	1. What is the use of pipe? Explain with an example? 2. Explain FIFO page replacement algorithm. Necessary reference string? Consider the following reference string 7,0,1,2,0,3,0,4,2,3,0,3,2,1,2,0,1,7,0,1. 3. What are the differences between? a) Logical and physical address? b) Page table and segment table? c) First-fit placement	24D41A6666 to 24D41A6670	CO4 CO5 CO5	I I V I

	and best-fit placement? 4. Illustrate layered-file system implementation? Mention the various file-directory structures. 5. Explain various directory operations in briefly?		CO 6 C06	III II
14.	1. Explain the concept of IPC between processes on different system? 2. What is demand paging and what are its uses? 3. Explain the various page replacement strategies. 4. Explain about sequential and indexed file access methods. 5. Consider the following disk queue with requests for I/O to blocks on cylinders 98, 183, 37, 122, 14, 124, 65, 67 in that order, using FCFS algorithm if the disk head is initially at cylinder 53, find the total head movement in cylinders. Also provide the necessary diagram to show the head movement for the above queue.	23D45A6603 to 23D45A660 6	CO 4 CO 5 CO 5 CO 6 C06	I II II V

FACULTY

HOD

	SRI INDU COLLEGE OF ENGG&TECH QUESTION BANK (Regulation:R22)			(Regulation: R22)
	Department of AIML			
	Sub. Code & Title	R22cse2213 - Operating Systems		
	Academic Year: 2025-26	Year/Sem./Section	II/I-AIML	
	Faculty Name & Designation	Mr. Ch PraveenReddy & Assistant. Professor		

UNIT – I			
OBJECTIVE QUESTIONS			
SL.NO		BT Level	Course Outcome
1C - 1	An Operating system executes the privileged instructions in (A) User mode (B) User and Kernel modes (C) Kernel mode (D) System Mode (E) Restricted mode	I	CO1
1C - 2	Which of the following is inappropriate for operating system in a computer system? (A) Manages the system's resources (B) Solves user computing problems (C) Controls execution of programs (D) Controls Input/output devices (E) Handles interrupts	I	CO1
1C - 3	Which of the following instruction leads to an interrupt? (A) Arithmetic overflow (B) Division by zero (C) illegal machine instruction execution (D) Ctrl+Z (E) All of the above	I	CO1
1C - 4	Device controller is (A) a hardware unit attached to the I/O bus (B) a software unit (C) an interface between a device and the main memory (D) is inbuilt into the CPU (E) interacts with the OS via ROM	I	CO1
1C - 5	Which of the following command to be issued by the process to the DMA controller if the processor wishes to read/write a data (A) read/write operation to be performed	I	CO1

	(B) address of the I/O device involved (C) starting location in the main memory to read data from or write data to (D) number of words to be read or written (E) All of the above		
1C - 6	Which of the following is not true for a multi-processor system? (A) increased throughput (B) increased reliability (C) fault-tolerant (D) each processor shares equal load (E) costly	I	CO1
1C - 7	The kernel is the core of an operating system, and it manages (A) random access memory (B) secondary storage (C) I/O devices (D) Processor (E) All of the above	I	CO1
1C - 8	The fork() system call returns (A) a negative value to the parent process if the creation of the child process is successful (B) zero to the parent process if the parent process gets interrupted during the child process creation (C) a positive value to the parent process if the creation of a child process is unsuccessful (D) the process ID of the child process to the parent process if the child process creation was successful (E) the process ID of the parent process to the child process if the child process creation was successful	II	CO1
1C - 9	Which of the statements is incorrect? (A) Shared memory is a tightly coupled system (B) Shared memory is a loosely coupled system (C) Shared memory is used for inter-process communication (D) Multiple processes can simultaneously access a shared memory (E) Process synchronization is needed when multiple processes access a shared memory	I	CO1
1C - 10	Which of the statements is incorrect? (A) The kernel is a program that constitutes the central core of the OS (B) The kernel provides essential services to all other parts of the OS (C) The kernel can directly interact with the user (D) The kernel can directly interact with the shell program (E) The kernel can directly interact with the hardware	I	CO1
1C - 11	Which of the following is not a system program? (A) Operating system (B) Device driver (C) Boot loader (D) Shell (E) User program	I	CO1
1C - 12	Which of the following is not a UNIX system call? (A) fork() (B) pipe() (C) ioctl()	I	CO1

	(D) Sleep() (E) open()		
1C - 13	Which of the operating system does not support modular structure? (A) UNIX (B) Solaris (C) MS-DOS (D) Linux (E) Window	I	CO1
1C - 14	Which of the following provides the interface for the user to get services from the operating system? (A) System call (B) Library function (C) Debugger (D) Assembler (E) Compiler	I	CO1
1C - 15	In connection with the system call, which of the statements seem to be appropriate? (A) the transition from user mode to kernel mode is done using a system call (B) mode bit is set to 0 when a process is executing in user mode (C) mode bit is set to 1 when a process is executing in kernel mode (D) a trap is a software interrupt generated by the user during system call execution (E) timer is a software that is used to prevent the infinite loop in a user program	I	CO1
FILL IN THE BLANKS			
1F - 1	_____ was designed to keep the processor and I/O devices, including storage devices, simultaneously busy to achieve maximum efficiency.	I	CO1
1F - 2	A process in the _____ state is in main memory and available for execution.	II	CO1
1F - 3	In a _____ multiprocessor all processors can perform the same functions so the failure of a single processor does not halt the machine.	I	CO1
1F - 4	Windows makes use of two types of process-related objects: processes and _____.	III	CO1
1F - 5	The _____ tables provide information about the existence of files, their location on secondary memory, their current status, and other attributes.	I	CO1
1F - 6	There are two broad categories of thread implementation: user-level threads (ULTs) and _____.	I	CO1
1F - 7	The key states for a thread are: Running, _____, and Blocked.	I	CO1
1F - 8	The state transition initiated by the user process itself in an operating system is _____	I	CO1
1F - 9	Operating system is ----- software.	I	CO1
1F - 10	File management is function of _____	I	CO1
1F - 11	Name the function which deals with hardware _____	I	CO1
1F - 12	An operating system acts as a/an _____ between	I	CO1

	hardware and software.		
1F - 13	A Control/Status register that contains the address of the next instruction to be fetched is called the _____.	I	CO1
1F - 14	The _____ is a device for staging the movement of data between main memory and processor registers to improve performance and is not usually visible to the programmer or processor.	I	CO1
1F - 15	A significant point about the _____ is that it contains sufficient information so that it is possible to interrupt a running process and later resume execution as if the interruption had not occurred.	II	CO1
MATCH THE FOLLOWING			
1M - 1	1. Operating System 2. Language Processor 3. Package Administration S/W 4. Utility 5. Customized S/W	a. Compiler b. Windows Vista c. Santi Hospital d. Spreadsheet e. Disk	I CO1
1M - 2	1.Threads 2.Scheduling 3.Process switch process 4.Non preemptive	a. Operating systems b. FCFS c. Light weight d. Mode switch	I CO1
1M - 3	1.Kernel 2.Device Programs 3.Utility Programs Program 4.Supporting multitasking Hardware components 5.Supporting multiprocessing designed to help analyses or maintain a computer	a. Program b. Heart of OS c. Concurrent d. Software control e. System software	I CO1
1M - 4	1.OS 2.CUI 3.GUI 4.Printer 5.Keyboard	a. Windows b. Kernel program c. Input devices d. Output devices e. DOCS	I CO1
1M - 5	1.Executable file 2.Active Entity 3.Process 4.Program execution 5.Kernel	a. Operating Systems b. Processor c. Passive entity d. next execution e. heap	I CO1
5 – MARKS QUESTIONS			
1D - 1	What is meant by operating Systems ? explain the types of OS	I	CO1
1D - 2	Discuss about operating system structure.	VI	CO1
1D - 3	Elaborate about operating system operations.	VI	CO1
1D - 4	What is process? Explain different process states.	I	CO1
1D - 5	Explain about the Types of operating systems in detail	II	CO1
1D - 6	Demonstrate about the co-operating process.	II	CO1
1D - 7	Explain about the Computer System Architecture	II	CO1
1D - 8	Explain about the Operating System Services.	II	CO1

1D - 9	Explain about Process Control Block with suitable Examples	II	CO1
1D - 10	What is System Calls? List out the parameters.	I	CO1
1D - 11	Discuss about the cluster system in details	VI	CO1
1D - 12	Write in detail about storage and memory management	I	CO1
1D - 13	Discuss about Process Scheduling in detail	VI	CO1
1D - 14	Define Context switch and write about operation on process	I	CO1
1D - 15	Define System call. Explain in detail with its types.	I	CO1

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	Department of AI&ML			
	Sub. Code & Title			
	R22cse2213 - Operating Systems			
	Academic Year: 2025-26		Year/Sem./Section	II/I AIML
	Faculty Name & Designation		Mr. Ch PraveenReddy & Assistant. Professor	

UNIT – II

OBJECTIVE QUESTIONS

SL.NO		BT Level	Course Outcome
2C - 1	A Process Control Block (PCB) includes (A) state of the program counter (PC) (B) state of the memory address register (MAR) (C) priority of the process (D) value of the base and limit registers (E) All of the above	I	CO2
2C - 2	A process terminates when (A) it attempts to access a memory location to which access is not permitted. (B) its parent process request to terminate it. (C) it executes an illegal instruction. (D) it exceeds the waiting time for an event to occur for which the process is waiting. (E) All of the above.	I	CO2
2C - 3	Shared-memory intercrosses communication (A) can be done at memory speed. (B) allows multiple processes to exchange information via kernel. (C) does not need process synchronization. (D) Does not need a shared region of memory. (E) supports delete() and receive() operations.	I	CO2
2C - 4	In indirect inter process communication between two processes, which of the following are two valid operations (A) delete() and add(). (B) send() and receive(). (C) delete() and send(). (D) add() and receive() (E) open() and close().	I	CO2
2C - 5	In direct inter process communication between two processes, a communication link is (A) only bidirectional. (B) only unidirectional.	I	CO2

	(C) established only if processes share a common mailbox. (D) may be associated with many processes. (E) is associated with exactly one pair of communicating processes		
2C - 6	A multicore system (A) supports multithreading. (B) multiple threads can execute concurrently. (C) improves system performance through multithreading. (D) sharing resources among threads is easier than shared memory. (E) All of the above.	I	CO2
2C - 7	The Banker's algorithm (A) is used to detect the deadlocks in the system (B) only works for single-process systems (C) is an approach to prevent deadlocks (D) requires knowledge of the current resource allocation of processes (E) is primarily used for memory management in operating systems	I	CO2
2C - 8	A multicore system executes a thread by the following number of core(s). (A) One (B) Two (C) Multiple (D) Depends on the structure of the thread (E) Depends on the structure of the CPU	I	CO2
2C - 9	A multi-threaded process (A) has multiple program counters, one for each thread (B) has multiple identities, one for each thread (C) can manage multiple requests from the same user (D) can be implemented as user-level threads or kernel-level threads (E) All of the above	I	CO2
2C - 10	In a Resource Allocation Graph with a cycle, (A) Deadlock is guaranteed to occur (B) Deadlock is possible but not guaranteed (C) Deadlock cannot occur (D) Deadlock resolution is automatic (E) None of the above.	III	CO2
2C - 11	Message-passing inter process communication allows multiple cooperating processes (A) to exchange information without the kernel. (B) to synchronize their actions without sharing the same address space. (C) to communicate by sharing the same address space. (D) which must be run in the same computer system. (E) using the fork() system call.	I	CO2
2C - 12	Which statement is incorrect in a many-to-one threading model? (A) Multiple user threads are managed in user space. (B) Multiple user threads map to a single kernel thread. (C) There is no overhead of transition from user mode to kernel mode. (D) The process will not be blocked even if any user thread executes a blocking system call.	I	CO2

	(E) None of the above.		
2C - 13	For the following set of processes scheduled using FCFS policy, determine the average waiting time. Process Arrival time Burst time P1 0 11 P2 2 4 P3 3 2 (A) 5.67 (B) 6.00 (C) 7.00 (D) 8.00 (E) 9.54	II	CO2
2C - 14	For the following set of processes scheduled using FCFS policy, determine the average turnaround time. Process Arrival time Burst time P1 0 11 P2 2 4 P3 3 2 (A) 10.66 (B) 11.66 (C) 12.66 (D) 13.68 (E) 14.70	II	CO2
2C - 15	Which statement is true for a preemptive scheduling algorithm? (A) CPU is allocated for the entire burst time to a process (B) Race conditions will never occur if data are shared among multiple processes (C) UNIX OS is not supporting preemptive scheduling (D) Round-Robin is not supporting preemptive scheduling (E) A low-priority process will wait if a high-priority process arrives simultaneously	I	CO2
FILL IN THE BLANKS			
2F - 1	DEL command is used to -----	I	CO2
2F - 2	A _____ computer combines two or more processors on a single piece of silicon.	I	CO2
2F - 3	A situation in which two or more processes are unable to proceed because each is waiting for one of the others to do something is a _____ .	I	CO2
2F - 4	In the case of competing processes three control problems must be faced: mutual exclusion, deadlock, and _____ .	I	CO2
2F - 5	The _____ is a directed graph that depicts a state of the system of resources and processes, with each process and each resource represented by a node.	I	CO2
2F - 6	What is meant by fork() function call?	I	CO2
2F - 7	_____ refers to the ability of an OS to support multiple, concurrent paths of execution within a single process.	I	CO2
2F - 8	The process is said to be operating in a _____ fashion if each process in the queue is given a certain amount of time, in turn, to execute and then returned to the queue, unless blocked.	I	CO2
2F - 9	The strategy of resource allocation denial is referred to as the	I	CO2

	_____.		
2F - 10	Spooling allowed the CPU to choose a particular job for execution leading to the concept called the ____	I	CO2
2F - 11	Operating System allocates ____ in such a manner so as to achieve the maximum best possible result.	I	CO2
2F - 12	To 'boot', the system the computer must have a(n)_____	I	CO2
2F - 13	Scheduling is allowing job to use the _____	I	CO2
2F - 14	Round robin is a _____ policy	I	CO2
2F - 15	In UNIX, name the system call which create(s) the new process_____.	I	CO2

MATCH THE FOLLOWING

2M - 1	1.FCFS 2.SJF 3.SRJF 4.Round Robin 5.Priority	a. high to low b. Quantum c. First come first serve d. shortest job first e. Shortest remaining job first	II	CO2
2M - 2	1. Symmetric 2. Asymmetric 3. Real time scheduling 4. User Mode 5. CPU utilization	a. Master/Slave b. Kernel Mode c. Burst time d. Interrupt e. self-scheduling	I	CO2
2M - 3	1. Bankers algorithm 2. Resources 3. Hold & Wait 4. Mutual exclusion 5. Rollback	a. Process b. Shared resources c. Recovery d. Deadlock e. Avoidance	III	CO2
2M - 4	1.Parent – 2. child 3.Cluster 4.fork() 5.cache	a. exit b. wait c. new creation d. copy e. group	I	CO2
2M - 5	1.Program counter 2.New 3.Run 4.Wait 5.Ready	a. Execute b. address to the next instruction c. Next instruction d. Waiting e. creation	I	CO2

5 – MARKS QUESTIONS

2D - 1	What is meant by Scheduling Criteria ? explain in details	I	CO2
2D - 2	Define Scheduling algorithm and its types.	I	CO2
2D - 3	What is preemptive and non-preemptive scheduling? Evaluate an algorithm for each scheduling type.	I	CO2
2D - 4	Evaluate round robin scheduling algorithm with an example.	V	CO2
2D - 5	Consider the following four processes, with the length of the CPU burst given in milliseconds. Process Arrival Time Burst Time P1 0 8 P2 1 4 P3 2 9	IV	CO2

	P4 3 5 Calculate the average waiting time for Preemptive SJF schedule (ii) non-preemptive SJF scheduling		
2D - 6	For the following example, calculate average waiting time and turnaround time for SJF and priority scheduling algorithms. Process Burst Time Priority P1 10 2 P2 29 3 P3 3 1 P4 7 4 P5 12 2	II	CO2
2D - 7	Discuss about Deadlock Prevention techniques with suitable examples.	I	CO2
2D - 8	What is Deadlock? What are the necessary conditions to occur for deadlock?	I	CO2
2D - 9	Explain deadlock recovery methods in detail.	II	CO2
2D - 10	Discuss about the System call interface for Process management in detail.	I	CO2
2D - 11	What is thread? List out the types of Threads.	I	CO2
2D - 12	Explain about the multithreads in details	II	CO2
2D - 13	Demonstrate Real time and Multiprocessor Scheduling.	VI	CO2
2D - 14	Discuss about Bankers Algorithm with suitable examples.	I	CO2
2D - 15	Explain about FCFS and SRJF algorithm with suitable solution	II	CO2



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Department of AI&ML

Sub. Code & Title

R22cse2213 - Operating Systems

Academic Year: 2025-26

Year/Sem./Section

II/I AIML

Faculty Name & Designation

Mr. Ch PraveenReddy & Assistant. Professor

UNIT – III

OBJECTIVE QUESTIONS

SL.NO		BT Level	Course Outcome
3C - 1	For the producer-consumer problem with unbounded buffer, the process that need not wait for the other process is/are (A) Producer (B) Consumer (C) Neither producer nor the consumer (D) Both produce and consumer (E) None of the other options	I	CO3
3C - 2	Which of the following statement is true for Critical Section Problem? (A) If a process is executing in its critical section, no other processes are allowed to enter into the critical section. (B) Multiple processes share the same data. (C) A bound must exist on the number of times other processes are allowed to enter the critical section. (D) Concurrent access to shared data may result in data inconsistency (E) All of the above	I	CO3
3C - 3	Solution to the critical section problem can be done on (A) Hardware level (B) Software level (C) Both hardware level and software level (D) Network level (E) None of the mentioned	I	CO3
3C - 4	The solution to the critical section problem ensures which of the following(s)?	I	CO3

	(A) Mutual exclusion (B) Progress (C) Bounded waiting (D) Mutual exclusion and Progress (E) Mutual exclusion, Progress, and Bounded waiting		
3C - 5	Which of the following represents the purpose of the “test_and_set” instruction? (A) Checks if a lock is available and acquires it if available (B) Sets a variable to a specified value (C) Checks if a variable is equal to a specified value (D) Atomically reads the value of a variable and sets it to a new value (E) Suspends the execution of a process for a specified duration	I	CO3
3C - 6	A signal (A) is an asynchronous event. (B) is handled by the appropriate signal handler. (C) is delivered to a process by the kernel when an interrupt occurs. (D) can be sent to a process by another process. (E) All of the above.	I	CO3
3C - 7	Which of the following can be used to design a correct solution to the Readers-Writers problem? (A) Semaphore (B) Monitor (C) Semaphore and Monitor (D) Mutex lock (E) Spinlock	I	CO3
3C - 8	Assume that the variable t is initialized to 0. Assuming that test_and_set() instruction performs the atomic operation. What will be the value of t after the execution of the code segment? if (test_and_set(&t) == 0) { /* critical section */ - - - - /* remainder section */ } (A) 0 (B) 1 (C) 2 (D) 3 (E) None of the above	I	CO3
3C - 9	Which of the following two operations are provided by the IPC facility? (A) Write & delete message (B) Delete & receive message (C) Send & delete a message (D) Receive & send message	I	CO4
3C - 10	The segment of code in which the process may change common variables, update tables, write into files is known as _____ (A) program) (B) race condition (C) synchronizing (D) critical section)	I	CO4

3C - 11	Pipe performs _____ communication. A. one-way B. two-way C. three-way D. N-way	I	CO4
3C - 12	Which of the following is an advantage of message passing over shared memory A. Simpler implementation B. Higher performance C. Easier to scale to multiple processors D. Lower overhead	I	CO4
3C - 13	Which of the following is an example of an asynchronous IPC mechanism? A. Shared Memory B. Message Queues C. Semaphores D. Signals	I	CO4
3C - 14	Message passing system allows processes to _____ A) communicate with each other without sharing same address space B) communicate with one another by resorting to shared data C) share data D) name the recipient or sender of the message	I	CO4
3C - 15	The link between two processes P and Q to send and receive messages is called A) communication link B) message-passing link C) synchronization link D) all of the mentioned	I	CO4
FILL IN THE BLANKS			
3F - 1	_____ is a section of code within a process that requires access to shared resources and that must not be executed while another process is in a corresponding section of code.	I	CO3
3F - 2	A situation in which multiple threads or processes read and write a shared data item and the final result depends on the relative timing of their execution is a _____ .	I	CO3
3F - 3	A _____ is a semaphore that takes on only the values of 0 and 1.	I	CO3
3F - 4	In the case of _____ , messages are not sent directly from sender to receiver but rather are sent to a shared data structure consisting of queues that can temporarily hold messages.	III	CO3
3F - 5	_____ is a function or action implemented as a sequence of one or more instructions that appears to be indivisible; no other process can see an intermediate state or interrupt the operations.	I	CO3
3F - 6	_____ is a synchronization mechanism used to solve the critical section problem.	I	CO3
3F - 7	_____ is a key component used in Peterson's algorithm for mutual exclusion in operating systems.	I	CO3

3F - 8	Inter-process communication mechanism provides two operations that are _____.	I	CO3
3F - 9	Inspired by the concept of co-routines, a _____ is a circular buffer allowing two processes to communicate on the producer-consumer model.	II	CO4
3F - 10	A _____ is a variable that controls the access to a common resource by multiple processes.	I	CO4
3F - 11	The _____ is the endpoint for sending or receiving data in a network.	I	CO4
3F - 12	_____ can read and write data to the message queue	I	CO4
3F - 13	_____ Communication between two unrelated processes.	I	CO4
3F - 14	Socket is a type of endpoint for _____ the data in a network.	V	CO4
3F - 15	The pipe is a type of data channel that is _____ in nature	I	CO4

MATCH THE FOLLOWING

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

5 – MARKS QUESTIONS

3D - 1	Define Race condition and Explain the critical section problem.	I	CO3
3D - 2	Discuss about Peterson's Solution problem with programing code.	II	CO3
3D - 3	Explain about Synchronization hardware in detail.	II	CO3

3D - 4	What is Semaphores? List out the atomic operations and explain them clearly	I	CO3
3D - 5	Explain about Semaphore usage, implementation & deadlock and starvation with suitable examples	II	CO3
3D - 6	Explain about Producer and consumer problem in critical section	II	CO3
3D - 7	Discuss about the classic Problems of Synchronization	II	CO3
3D - 8	Elaborate the Dining – Philosophers solution using monitors.	IV	CO3
3D - 9	Explain state IPC paradigms and implementations.	II	CO4
3D - 10	What are the models of IPC? Explain it.	I	CO4
3D - 11	What is the use of pipes explain with an example?	I	CO4
3D - 12	Explain the concept of Inter Process Communication Mechanisms with an example?	II	CO4
3D - 13	Difference between Message queue and Shared memory?	II	CO4
3D - 14	Explain use of message passing & semaphore for inter process communication?	II	CO4
3D - 15	Explain the concept of IPC between processes on different system?	II	CO4

UNIT IV

OBJECTIVE QUESTIONS

SRI INDU COLLEGE OF ENGG & TECH

QUESTION BANK

(Regulation:R22)

Department of AI&ML

(Regulation: R22)

SL.NO		BT Level	Course Outcome
4C - 1	The table contains the base address of each page in physical memory. _____ a) procss b) memory c) page d) frame	II	CO5
4C - 2	The instruction being executed, must be in _____ a) physical memory b) logical memory c) physical & logical memory d) none of the mentioned	II	CO5
4C - 3	The pager concerns with the _____ a) individual page of a process		CO5

	b) entire process c) entire thread d) first page of a process	I	
4C - 4	Swap space exists in _____ a) primary memory b) secondary memory c) cpu d) none of the mentioned	I	CO5
4C - 5	Effective access time is directly proportional to _____ a) page-fault rate b) hit ratio c) memory access time d) none of the mentioned	I	CO5
4C - 6	In FIFO page replacement algorithm, when a page must be replaced a) oldest page is chosen b) newest page is chosen c) random page is chosen d) none of the mentioned	I	CO5
4C - 7	A process is thrashing if _____ a) it is spending more time paging than executing b) it is spending less time paging than executing c) page fault occurs d) swapping cannot take place	I	CO5
4C - 8	Physical memory is broken into fixed-sized blocks called _____ a) frames b) pages c) backing store d) none of the mentioned	II	CO5
4C - 9	Every address generated by the CPU is divided into two parts. a) frame bit & page number b) page number & page offset c) page offset & frame bit d) frame offset & page offset	I	CO5
4C - 10	The size of a page is typically _____ a) varied b) power of 2 c) power of 4 d) none of the mentioned	I	CO5
4C - 11	With paging there is no _____ fragmentation. a) internal b) external c) either type of d) none of the mentioned	I	CO5
4C - 12	Paging increases the _____ time. a) waiting b) execution c) context – switch d) all of the mentioned	I	CO5
4C - 13	The page table registers should be built with _____ a) very low speed logic		CO5

	b) very high speed logic c) a large memory space d) none of the mentioned	II	
4C - 14	Smaller page tables are implemented as a set of _____ a) queues b) stacks c) counters d) registers	II	CO5
4C - 15	Which one of the following is the address generated by CPU? a) physical address b) absolute address c) logical address d) none of the mentioned	I	CO5
FILL IN THE BLANKS			
4F - 1	The _____ shows the frame location for each page of the process.	I	CO5
4F - 2	The basic tools of memory management are paging and _____.	I	CO5
4F - 3	A _____ is an actual location in main memory.	II	CO5
4F - 4	A _____ is a variable length block of data that resides in secondary memory.	II	CO5
4F - 5	A _____ is a fixed length block of main memory.	I	CO5
4F - 6	An address generated by the CPU is known as a _____.	II	CO5
4F - 7	Logical address space also known as a _____.	II	CO5
4F - 8	A Physical address is also known as a _____.	I	CO5
4F - 9	Main memory is divided into small fixed-sized blocks of (physical) memory called _____.	II	CO5
4F - 10	The _____ is mapped to the segment table,	II	CO5
4F - 11	Paging is used to retrieve processes from _____ to primary memory.	I	CO5
4F - 12	The _____ Page Replacement Algorithm removes the Page in the frame	I	CO5
4F - 13	_____ a process temporarily into a secondary memory from the main memory.	I	CO5

4F - 14	The _____ is used as an index into the page table.	II	CO5
4F - 15	If the page to be searched is found among the frames then, this process is known as _____ .	III	CO5
MATCH THE FOLLOWING			
4M - 1	1. Paging 2. Segmentation 3. Logical address 4. Physical address 5. Swapping	a. An address seen by the memory unit b. Fixed size blocks c. Roll-out d. Address generated by CPU e. Variable size blocks	CO5
4M - 2	1. First fit 2. Best fit 3. worst fit 4. Logical address 5. Physical address	a. Frame number + Page offset b. Free hole c. Page number+page offset d. Smallest hole e. Largest hole	CO5
4M - 3	1. Paging 2. Segmentation 3. Demand Paging 4. Page fault 5. Thrashing	a. No internal fragmentation b. Internal fragmentation c. Page hit d. Global page replacement e. External fragmentation	CO5
4M - 4	1. Equal frame allocation 2. Priority frame allocation 3. Optimal page replacement 4. FIFO page replacement 5. LRU page replacement	a. Oldest page b. Divide the no. of frames by process c. New page d. Replacing page e. Quantity of frames	CO5
4M - 5	1. Page hit 2. Page fault 3. Virtual memory 4. Cache memory 5. RAID	a. Page allocation & Resource allocation b. Fault tolerance c. Hit ration d. Process are not found e. Process are found	CO5
5 – MARKS QUESTIONS			
4D - 1	Briefly explain about segmentation?	II	CO5
4D - 2	Explain LRU page replacement algorithm with this example.	II	CO5
4D - 3	Consider the following reference string 7,0,1,2,0,3,0,4,2,3,0,3,2,1,2,0,1,7,0,1 Assume there are three frames.	III	CO5

	Apply LRU replacement algorithm to the reference string above and find out how many page faults are produced. Illustrate the LRU page replacement algorithm in detail and also two feasible implementation of the LRU algorithm		
4D - 4	What is paging? Explain the basic method for implementing paging.	I	C05
4D - 5	Describe about a) Contiguous memory allocation b) Fragmentation.	II	C05
4D - 6	Illustrate about allocation of frames.	III	C05
4D - 7	Explain FIFO page replacement algorithm necessary reference string? Consider the following reference string 7,0,1,2,0,3,0,4,2,3,0,3,2,1,2,0,1,7,0,1.	IV	C05
4D - 8	Explain the various page replacement strategies.	I	C05
4D - 9	What is demand paging and what are its uses?	I	C05
4D - 10	Write about the techniques for structuring the page table.	I	C05
4D - 11	What are the differences between? a) Logical and physical address? b) Page table and segment table? c) First-fit placement and best-fit placement?	I	C05
4D - 12	Explain about page replacement algorithms?	I	C05
4D - 13	Difference between segmentation paging and demand paging with an example?	V	C05
4D - 14	What are the advantages and disadvantages of page replacement algorithms?	I	C05
4D - 15	How can the system distinguish between the pages that are in main memory from the pages that are on the disk?	I	C05

	SRI INDU COLLEGE OF ENGG & TECH QUESTIONBANK (Regulation:R22) Department of AI&ML			(Regulation: R22)
	Sub. Code & Title		R22cse2213 - Operating Systems	
	Academic Year: 2025-26		Year/Sem./Section	II/I AI&ML
	Faculty Name & Designation		Mr. Ch PraveenReddy & Assistant. Professor	

UNIT – V			
OBJECTIVE QUESTIONS			
SL.NO		BT Level	Course Outcome
5C - 1	Data cannot be written to secondary storage unless written within a _____ a) file b) swap space c) directory d) text format	II	CO6
5C - 2	File attributes consist of _____ a) name b) type c) identifier d) all of the mentioned	I	CO6
5C - 3	The information about all files is kept in _____ a) swap space b) operating system c) separate directory structure d) none of the mentioned	I	CO6
5C - 4	Which of the following are the two parts of the file name? a) name & identifier b) identifier & type c) extension & name d) type & extension	II	CO6
5C - 5	What will happen in the single level directory? a) all directories must have unique names	II	

	b) all files must have unique names c) all files must have unique owners d) all of the mentioned		CO6
5C - 6	What is the disadvantage of the two level directory structure? a) it does not solve the name collision problem b) it solves the name collision problem c) it does not isolate users from one another d) it isolates users from one another	II	CO6
5C - 7	What is the main problem with access control lists? a) their maintenance b) their length c) their permissions d) all of the mentioned	II	CO6
5C - 8	All users in a group get _____ access to a file. a) different b) similar c) same d) none of the mentioned	I	CO6
5C - 9	With a requested page and several subsequent pages are read and cached. a) write ahead b) read ahead c) free-behind d) add-front	II	CO6
5C - 10	_____ is an approach to restricting system access to authorized users. a) Role-based access control b) Process-based access control c) Job-based access control d) None of the mentioned	II	CO6
5C - 11	In the sequential access method, information in the file is processed _____ a) one disk after the other, record access doesn't matter b) one record after the other c) one text document after the other d) none of the mentioned	I	CO6
5C - 12	Sequential access method _____ on random access devices. a) works well b) doesn't work well c) maybe works well and doesn't work well	I	CO6

	d) none of the mentioned		
5C - 13	A file control block contains the information about _____ a) file ownership b) file permissions c) location of file contents d) all of the mentioned	I	CO6
5C - 14	What is raw disk? () a) disk without file system b) empty disk c) disk lacking logical file system d) disk having file system	II	CO6
5C - 15	The open file table has a/an _____ associated with each file. a) file content b) file permission c) open count d) close count	II	CO6
FILL IN THE BLANKS			
5F - 1	A file is a/an _____ data type.	I	CO6
5F - 2	The operating system keeps a small table containing information about all open files called _____	I	CO6
5F - 3	The open file table has a/an _____ associated with each file.	II	CO6
5F - 4	The directory can be viewed as a _____ that translates file names into their directory entries.	I	CO6
5F - 5	Protection is only provided at the _____ level.	I	CO6
5F - 6	Disks are segmented into one or more partitions, each containing a file system or _____	II	CO6
5F - 7	In _____ writes, the data is stored in the cache.	I	CO6
5F - 8	The protection domain of a process contains _____	I	CO6
5F - 9	The larger the block size, the _____ the internal fragmentation.	I	CO6
5F - 10	To create a new file application program calls _____	I	CO6

5F - 11	A tree structure _____ the sharing of files and directories.	I	CO6
5F - 12	_____ is a unique tag, usually a number identifies the file within the file system.	I	CO6
5F - 13	FAT stands for _____	I	CO6
5F - 14	The open file table has a/an_____associated with each file.	I	CO6
5F - 15	_____ is a unique tag, usually a number identifies the file within the file system.	II	CO6
MATCH THE FOLLOWING			
5M - 1	1. Bitmap 2.Linked list 3.Grouping 4.Counting 5.File allocation table	a. No of disk blocks b. FAT c. No of free contiguous disk blocks d. Store no of blocks e. 0's & 1's	III CO6
5M - 2	1. Read 2. Write 3.Execute 4.Append 5.Delete	a. Writer or rewriting file b. Deleting the file c. Reading from a file d. Loading the file e. writes the new information to the already existing file	III CO6
5M - 3	1.Iseek 2. Stat 3.Istat 4.Fstat 5.ioctl	a. Input/Output control b. Read/Write file offset c. An open file d. Returns data e. I-node Information	II CO6
5M - 4	1. FCFS 2. SSTF 3. SCAN 4. CSCAN 5. LOOK	a. The disk arm again scan b. The disk moves in a particular direction c. Shortest seek time first d. First come first serve e. Similar to the SCAN disk scheduling	II CO6
5M - 5	1. Application programs 2.Logical file system 3. File organization module 4. I/O control block 5. Devices	a. Divided into various logical blocks b. First request is directed to the logical file system c. CPU monitor d. Module decided which physical the application e. It can access hard disk	II CO6
5 – MARKS QUESTIONS			
5D - 1	Explain about sequential and indexed file access methods.	II	CO6

5D - 2	Illustrate layered-file system implementation? Mention the various file-directory structures.	III	CO6
5D - 3	Explain the three allocation methods in file system implementation? Illustrate with proper diagram.	II	CO6
5D - 4	Explain i) File sharing ii) Protection.	II	CO6
5D - 5	Explain about access methods?	II	CO6
5D - 6	Explain in detail the four approaches to free –space management?	II	CO6
5D - 7	Discuss about the access rights and management simultaneous access.	II	CO6
5D - 8	Explain disk structure a disk scheduling.	II	CO6
5D - 9	Explain swap-space management.	II	CO6
5D - 10	Consider the following disk queue with requests for I/O to blocks on cylinders 98,183,37,122,14,124,65,67 in that order, using FCFS algorithm of the disk head is initially at cylinder 53 find the total head movement in cylinders. Also provide the necessary diagram to show the head movement for the above queue.	V	CO6
5D - 11	Explain various directory operations in briefly?	II	CO6
5D - 12	What is a file? List the various file attributes and file operations?	I	CO6
5D - 13	Draw the diagram for tree structured directories and explain it.?	II	CO6
5D - 14	What are the advantages and disadvantages of free space management?	I	CO6
5D - 15	Explain various system calls for file management system?	II	CO6

Model papers

BR-22

D4

SRI INDU COLLEGE OF ENGINEERING & TECHNOLOGY
II B.Tech - II Semester - I Mid Term Examinations, MARCH - 2025
(R22CSE2213) OPERATING SYSTEMS
(For CSE, IT, DS, CS & CSIT)

Duration: 2 Hrs

Dt: 25-03-2025, Day-2 (FN)

Max Marks: 30M

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

Course Outcomes: CO

Part - A (10 Marks)**SECTION A1: Answer all multiple choice questions.**

Marks: 10Qx1/2M = 5M
 CO1

- | | | | | |
|--|--|--|--|-----|
| 1. What is an operating system? | | | | |
| A) interface between the hardware and application programs | | | | |
| B) collection of programs that manages hardware resources | | | | |
| C) system service provider to the application programs | | | | |
| D) all of the mentioned | | | | |
| 2. In real time operating system _____ | | | | CO1 |
| A) process scheduling can be done only once | | | | |
| B) all processes have the same priority | | | | |
| C) kernel is not required | | | | |
| D) a task must be serviced by its deadline period | | | | |
| 3. Whenever a process needs I/O to or from a disk it issues a _____ | | | | CO1 |
| A) system call to the operating system | | | | |
| B) a special procedure | | | | |
| C) system call to the CPU | | | | |
| D) all of the mentioned | | | | |
| 4. Which of the following is not a system program? | | | | CO1 |
| A) Operating systems | | | | |
| B) Device driver | | | | |
| C) Boot loader | | | | |
| D) User program | | | | |
| 5. In Operating Systems, which of the following is/are CPU scheduling algorithms? | | | | CO2 |
| A) Priority | | | | |
| B) Round Robin | | | | |
| C) Shortest Job First | | | | |
| D) All of the mentioned | | | | |
| 6. CPU scheduling is the basis of _____ | | | | CO2 |
| A) multiprogramming operating systems | | | | |
| B) larger memory sized systems | | | | |
| C) multiprocessor systems | | | | |
| D) none of the mentioned | | | | |
| 7. A deadlock avoidance algorithm dynamically examines the _____ to ensure that a circular wait condition can never exist. | | | | CO2 |
| A) operating system | | | | |
| B) resources | | | | |
| C) system storage state | | | | |
| D) resource allocation state | | | | |
| 8. Which one of the following is a synchronization tool? | | | | CO3 |
| A) thread | | | | |
| B) pipe | | | | |
| C) semaphore | | | | |
| D) socket | | | | |
| 9. Which of the following conditions must be satisfied to solve the critical section problem? | | | | CO3 |
| A) Mutual Exclusion | | | | |
| B) Progress | | | | |
| C) Bounded Waiting | | | | |
| D) All of the mentioned | | | | |
| 10. A minimum of _____ variable(s) is/are required to be shared between processes to solve the critical section problem. | | | | CO3 |
| A) one | | | | |
| B) two | | | | |
| C) three | | | | |
| D) four | | | | |

P.T.O

SECTION A2: Answer All fill in the blank questions.

Marks: 6Qx1/2M = 3M

- | | | |
|---|-----|-----|
| 11. _____ was designed to keep the processor and I/O devices, including storage devices, simultaneously busy to achieve maximum efficiency. | I | CO1 |
| 12. A process in the _____ state is in main memory and available for execution. | II | CO1 |
| 13. There are two broad categories of thread implementation: user-level threads (ULTs) and | I | CO1 |
| 14. DEL command is used to _____ | I | CO2 |
| 15. A _____ computer combines two or more processors on a single piece of silicon. | I | CO2 |
| 16. _____ is a section of code within a process that requires access to shared resources and that must not be executed while another process is in a corresponding section of code. | III | CO3 |

SECTION A3: Answer All Match the following questions

Marks: 2Qx1M = 2M

- | | | | | | | | | | | | | | |
|-------------------------------|--|---------------------|----------------|-----------------------|------------------|-------------------------------|---------------------------|----------------|-----------------------|-------------------|---------------------------------|----|-----|
| 17. | <table border="1"> <tr><td>1. Operating System</td><td>A. Compiler</td></tr> <tr><td>2. Language Processor</td><td>B. Windows Vista</td></tr> <tr><td>3. Package Administration S/W</td><td>C. Santi Hospital</td></tr> <tr><td>4. Utility</td><td>D. Spreadsheet</td></tr> <tr><td>5. Customized S/W</td><td>E. Disk</td></tr> </table> | 1. Operating System | A. Compiler | 2. Language Processor | B. Windows Vista | 3. Package Administration S/W | C. Santi Hospital | 4. Utility | D. Spreadsheet | 5. Customized S/W | E. Disk | I | CO1 |
| 1. Operating System | A. Compiler | | | | | | | | | | | | |
| 2. Language Processor | B. Windows Vista | | | | | | | | | | | | |
| 3. Package Administration S/W | C. Santi Hospital | | | | | | | | | | | | |
| 4. Utility | D. Spreadsheet | | | | | | | | | | | | |
| 5. Customized S/W | E. Disk | | | | | | | | | | | | |
| 18. | <table border="1"> <tr><td>1. FCFS</td><td>A. High to low</td></tr> <tr><td>2. SJF</td><td>B. Quantum</td></tr> <tr><td>3. SRJF</td><td>C. First come first serve</td></tr> <tr><td>4. Round Robin</td><td>D. Shortest job first</td></tr> <tr><td>5. Priority</td><td>E. Shortest remaining job first</td></tr> </table> | 1. FCFS | A. High to low | 2. SJF | B. Quantum | 3. SRJF | C. First come first serve | 4. Round Robin | D. Shortest job first | 5. Priority | E. Shortest remaining job first | II | CO2 |
| 1. FCFS | A. High to low | | | | | | | | | | | | |
| 2. SJF | B. Quantum | | | | | | | | | | | | |
| 3. SRJF | C. First come first serve | | | | | | | | | | | | |
| 4. Round Robin | D. Shortest job first | | | | | | | | | | | | |
| 5. Priority | E. Shortest remaining job first | | | | | | | | | | | | |

Part – B (20 Marks)

Answer any FOUR questions.

Marks: 4Qx5M = 20M

- | | | |
|--|-----|-----|
| 19. List and explain any five Operating system types in detail. | IV | CO2 |
| 20. Define Process? Explain about Process State Diagram. | III | CO1 |
| 21. Evaluate round robin scheduling algorithm with an example. | V | CO2 |
| 22. Consider the following four processes, with the length of the CPU burst given in milliseconds. | IV | CO3 |

Process ID	Arrival Time	Burst Time
1	0	6
2	1	4
3	2	1
4	3	3
5	4	7

Calculate the average waiting time for Non-preemptive SJF scheduling.

- | | | |
|---|-----|-----|
| 23. Demonstrate Multiple -Processor Scheduling in OS. | III | CO2 |
| 24. Explain in detail about the critical section problem. | V | CO3 |

SRI INDU COLLEGE OF ENGINEERING & TECHNOLOGY
II B.Tech - II Semester - II Mid Term Examinations, JUNE - 2025
(R22CSE2213) OPERATING SYSTEMS

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

Duration: 2 Hrs

Dt: 13-06-2025, Day-2 (FN)

Max Marks: 30M

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

Course Outcomes: CO

Part - A (10 Marks)

SECTION A1: Answer All multiple choice questions.

Marks: 10Qx1/2M = 5M

- | | | | |
|---|-----|-----|-----|
| 1. Which one of the following is a synchronization tool? | [] | I | CO3 |
| A) thread B) pipe C) semaphore D) socket | | | |
| 2. Process synchronization can be done on _____ | [] | I | CO3 |
| A) hardware level B) software level | | | |
| C) both hardware and software level D) none of the mentioned | | | |
| 3. Every address generated by the CPU is divided into two parts. They are _____ | [] | I | CO5 |
| A) frame bit & page number | | | |
| B) page number & page offset | | | |
| C) page offset & frame bit | | | |
| D) frame offset & page offset | | | |
| 4. Which of the following page replacement algorithms suffers from Belady's Anomaly? | [] | II | CO5 |
| A) Optimal replacement B) LRU | | | |
| C) FIFO D) Both optimal replacement and FIFO | | | |
| 5. A process refers to 5 pages, A, B, C, D, E in the order: A, B, C, D, A, B, E, A, B, C, D, E. If the page replacement algorithm is FIFO, the number of page transfers with an empty internal store of 3 frames is _____ | [] | III | CO5 |
| A) 8 B) 10 C) 9 D) 7 | | | |
| 6. A memory page containing a heavily used variable that was initialized very early and is in constant use is removed, then the page replacement algorithm used is _____ | [] | III | CO5 |
| A) LRU B) LFU C) FIFO D) None of the mentioned | | | |
| 7. Reliability of files can be increased by _____ | [] | V | CO6 |
| A) keeping the files safely in the memory | | | |
| B) making a different partition for the files | | | |
| C) by keeping them in external storage | | | |
| D) by keeping duplicate copies of the file | | | |
| 8. By Preallocating the inodes and spreading them across the volume, we _____ the system performance. | [] | VI | CO6 |
| A) improve B) decrease C) maintain D) do not affect | | | |
| 9. To create a new file application program calls _____ | [] | II | CO6 |
| A) basic file system B) logical file system | | | |
| C) file-organisation module D) none of the mentioned | | | |
| 10. In a tree structure, when deleting a directory that is not empty? _____ | [] | III | CO6 |
| A) The contents of the directory are safe | | | |
| B) The contents of the directory are also deleted | | | |
| C) contents of the directory are not deleted | | | |
| D) none of the mentioned | | | |

P.T.O

SECTION A2: Answer All fill in the blank questions.

Marks: 6Qx1/2M = 3M

11. A _____ is a variable that controls the access to a common resource by multiple processes. I CO4
12. Bounded capacity and Unbounded capacity queues are referred to as _____. I CO4
13. In paged memory systems, if the page size is increased, then the internal fragmentation generally _____. II CO5
14. Working set model for page replacement is based on the assumption of _____. III CO5
15. Disks are segmented into one or more partitions, each containing a file system or _____. I CO6
16. When keeping a list of all the links/references to a file, and the list is empty, implies that _____. II CO6

SECTION A3: Answer All Match the following questions

Marks: 2Qx1M = 2M

17. Match the pairs in the following question. V CO5

List – I		List – II	
1.	Virtual Memory	A.	Temporal locality
2.	Shared memory	B.	Spatial Locality
3.	Look-ahead buffer	C.	Address Translation
4.	Look-aside buffer	D.	Mutual exclusion

18.

1.	Bitmap	A.	No of disk blocks
2.	Linked list	B.	No of free contiguous disk blocks
3.	Grouping	C.	Store no of blocks
4.	Counting	D.	0's and 1's

 III CO6

Part – B (20 Marks)

Answer any FOUR questions.

Marks: 4Qx5M = 20M

19. What are the models of IPC? Explain in detail. I CO4
20. Explain the concept of Inter Process Communication Mechanisms with an example. II CO4
21. Explain about page replacement algorithms. I CO5
22. Describe about i) Contiguous memory allocation and ii) Fragmentation II CO5
23. What is a file? List the various file attributes and file operations. I CO6
24. Explain various system calls for file management system. III CO6

BR-22

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SRI INDU COLLEGE OF ENGINEERING & TECHNOLOGY

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

II B.Tech. II Semester (REG & SUPPL) End Examinations – JUNE 2025

(R22CSE2213) OPERATING SYSTEMS

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

Day-3(FN)

28/06/2025

Duration: 3 Hrs

Maximum Marks: 60M

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

Course Outcomes : CO

PART – A

Answer ALL the following questions.

(10Qx1M=10M)

1. a) What is meant by Multiprogramming?
- b) List the differences between process and thread in OS.
- c) What are the algorithms available for deadlock avoidance.
- d) Mention the function of fork () system call.
- e) Define Race condition.
- f) What is pipe and how does it works?
- g) List out page replacement algorithms.
- h) What is the demand paging?
- i) Write down the principles of file protection.
- j) List out the allocation methods.

I CO1
I CO1
II CO2
II CO2
II CO3
III CO3
I CO4
II CO4
III CO5
III CO5

PART – B

Answer FIVE questions choosing at least one from each unit.

(5Qx10M=50M)

UNIT-I

- 2a. Discuss in detail about the following
 - i) System calls
 - ii) Distributed systems.

III CO1

(OR)

- 2b. Define Process. Describe different types of process schedulers.

II CO1

UNIT-II

- 3a. i) What is Deadlock? What are necessary conditions for Deadlock to occur?
ii) Give possible algorithm for Deadlock Detection.

III CO2

(OR)

- 3b. Explain Round Robin (RR) and SJF scheduling algorithm with an example.

IV CO2

UNIT-III

- 4a. i) Illustrate the Semaphore functions with an example.
ii) Discuss in detail about the Dining-Philosophers solution using monitors.

III CO3

(OR)

- 4b. What is the motivation for establishing inter process communication? Explain different methods of IPC.

II CO3

UNIT-IV

- 5a. i) What is the need of demand paging? Explain briefly in detail.
ii) Explain contiguous memory management techniques.

III CO4

(OR)

- 5b. Perform LRU and FIFO optimal page replacement algorithm on the following reference string. 1,2,3,4,2,1,5,6,2,1,2,3,7,6,3,2,1,2,3,6 with 4 page frame. Find the number of page faults.

IV CO4

UNIT-V

- 6a. Define Directory. Explain in detail structure of directory in OS.

II CO5

(OR)

- 6b. Describe about the following system calls.

II CO5

i) lseek()

ii) ioctl()

iii) stat()
