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
Estd.2001

NAAC
NATIONAL ASSESSMENT AND ACCREDITATION COUNCIL

HANDOUT

II Year I Semester

DEPARTMENT OF AI-DS

ACADEMIC YEAR 2023-2024

SRI INDU COLLEGE OF ENGINEERING & TECHNOLOGY

(An Autonomous Institution under UGC, New Delhi)

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

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PARTMENT OF AI-DS

HANDOUT- INDEX

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iv)	End Examination Questions (Model Paper)
v)	Mid-1 & Mid-2 Questions (Model Paper)

SRI INDU COLLEGE OF ENGINEERING & TECHNOLOGY
B. TECH –INFORMATION TECHNOLOGY

INSTITUTION VISION

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

INSTITUTION MISSION

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

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

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

DEPARTMENT VISION

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

DEPARTMENT MISSION

The Department has following Missions:

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

DM2 To provide a conducive environment towards innovation and skills.

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

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

PROGRAM EDUCATIONAL OBJECTIVES (PEOs)

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

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

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

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

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 engineeringsciences.
PO 3	**Design / development of Solutions:** Design solutions for complex engineering problems and design systemcomponents 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 includingdesign 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 ITtools 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 theengineering practice
PO 9	**Individual and team work:** Function effectively as an individual, and as a member or leader in diverseteams, 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 designdocumentation, 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 projectsand in multidisciplinary environments.
PO 12	**Life-longlearning:**Recognizetheneedfor,andhavethepreparationandabilitytoengageinindependent and life-long learning in the broadest context of technological Change.
Program Specific Outcomes	
PSO 1	**Software Development:** To apply the knowledge of Software Engineering, Data Communication, Web Technology and Operating Systems for building IOT and Cloud Computing applications.
PSO 2	**Industrial Skills Ability:** Design, develop and test software systems for world-wide network of computers toprovide solutions to real world problems.
PSO 3	**Project implementation:** Analyze and recommend the appropriate IT Infrastructure required for the implementationof a project.

COURSE OUTCOMES (CO's)

Academic Year: 2023-24

Class : II YEAR-I SEM.

Course Name : OPERATING SYSTEM (R22CSE2213)

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

C213.1	Understand Operating System structures and Process concepts. (Remember) .
C213.2	Gain knowledge in scheduling algorithms and Deadlocks. (Apply) .
C213.3	Demonstrate process management and synchronization. (Evaluate)
C213.4	Understand IPC between processes on single and different systems (Understand)
C213.5	Implement Memory and Virtual Memory Management techniques. .(Apply)
C213.6	Explain how a simple file system organizes data in the hard disk. (Analyze)

COURSE ARTICULATION MATRIX

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C213.1	1	2	3	3	1	-	-	-	-	-	-	1	1	2	2
C213.2	1	2	2	2	3	1	-	-	-	-	-	-	1	2	2
C213.3	-	1	2	3	-	-	-	-	-	-	-	-	1	2	1
C213.4	1	2	2	2	2	1	-	-	-	1	-	-	-	1	1
C213.5	-	1	2	1	1	-	-	-	-	-	-	-	-	1	1
C213.6	-	1	2	3	1	-	-	-	-	-	-	-	1	2	1
C213	**1**	**1.5**	**216**	**2.33**	**1.6**	**1**	**1**	**1**	**1**	**1**	**-**	**1**	**1**	**1.6**	**1.33**

OPERATING SYSTEMS

SYLLABUS

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 incomputing.
- Ability to recognize and resolve user problems with standard operating environments.
- Gain practical knowledge of how programming languages, operating systems, andarchitectures 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, SynchronizationHardware, 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.

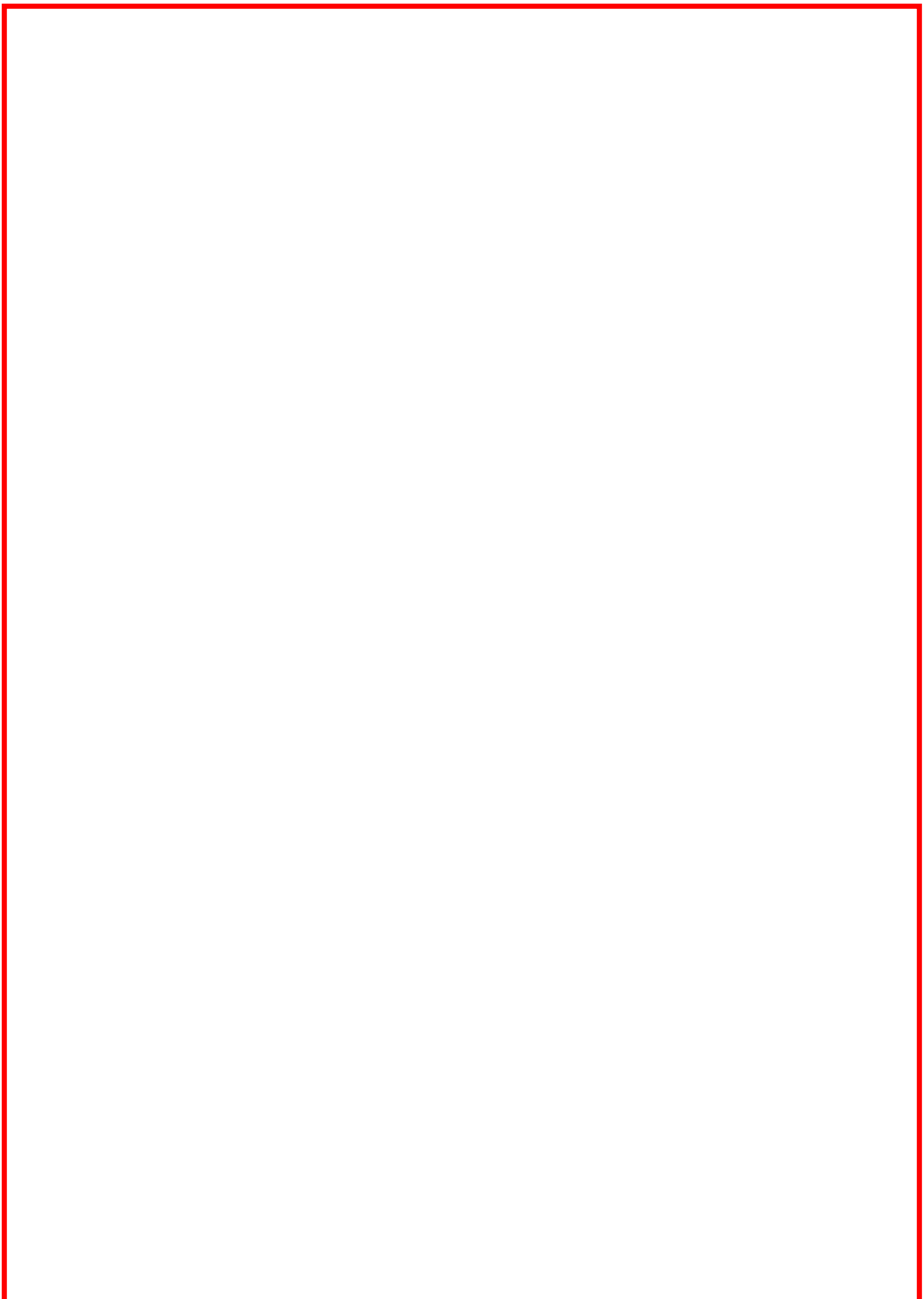
TEXT BOOKS:

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.

BR22 – B.TECH. –ARTIFICIAL INTELLIGENCE & DATA SCIENCE

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-DS**	**Prepared on Feb' 2025**
	Sub. Code & Title | **R22CSE2213 - Operating System**	
	Academic Year: 2025-26 | **Year/Sem.** | **II/I**	
	Faculty Name & Designation | **Mr.R.MADHAVA REDDY Assistant Professor**	

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

	SRI INDU COLLEGE OF ENGINEERING & TECHNOLOGY **LESSON PLAN** **(Regulation :R22)** **DEPARTMENT OF AI-DS**	**Prepared on Feb' 2025**
	Sub. Code & Title | **R22CSE2213 - Operating System**	
	Academic Year: 2025-26 | **Year/Sem.** | **II/I**	
	Faculty Name & Designation | **Mr.R.MADHAVA REDDY, Assistant Professor**	

Unit/ Item No.	Topic (s)	Book Reference	Page (s) From	Page (s) To	Teaching Methodology	Proposed No. of Periods	Actual Date of Handled	CO/RBT
UNIT-II (CPU SCHEDULING)							**16**	
2.1	Scheduling Criteria	T1	187	188	Black Board	01		CO2,RB2
2.2	Scheduling algorithms	T1	188	198	Black Board	04		CO2,RB5
2.3	Multiple-Processor Scheduling	T1	200	206	Black Board	01		CO2,RB3
2.4	System call Interface for process management-fork,exit,wait,waitpid,exec	T1	812	814	Black Board	02		CO1,RB3
2.5	**Deadlocks** - System Model	T1	283	284	Black Board	01		CO3,RB2
2.6	Deadlock Characterization	T1	285	289	Black Board	01		CO3,RB1
2.7	Methods for Handling Deadlocks	T1	290	291	Black Board	01		CO3,RB4
2.8	Deadlock Prevention	T1	291	294	Black Board	01		CO3,RB3
2.9	Deadlock Avoidance	T1	294	300	Black Board	01		CO3,RB4
2.10	Deadlock Detection and Recovery from Deadlock	T1	301	305	Black Board	01		CO3,RB5
	Review	**Signature of the HOD/Coordinator**						

	SRI INDU COLLEGE OF ENGINEERING & TECHNOLOGY **LESSON PLAN** **(Regulation :R22)** **DEPARTMENT OF AI-DS**	**Prepared on Feb' 2025**
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	Academic Year: 2025-26 | **Year/Sem.** | **II/I**	
	Faculty Name & Designation | **Mr.R.MADHAVA REDDY , 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-III (PROCESS MANAGEMENT AND SYNCHRONIZATION)								**15**
3.1	Process Synchronization	T1	225	227	Black Board	01		CO3,RB1
3.2	The Critical section Problem	T1	227	229	Black Board	01		CO3,RB3
3.3	Synchronization Hardware	T1	231	234	Black Board	01		CO3,RB2
3.4	Semaphores	T1	234	239	Black Board	01		CO3,RB1
3.5	Classic Problems of Synchronization	T1	239	244	Black Board	02		CO3,RB4
3.6	Critical Region ,Monitors	T1	244	252	Black Board	01		CO3,RB1
3.7	Inter Process Communication	T1	116	122	Black Board	02		CO2,RB2
3.8	IPC on single Computer	T1	122	127	Black Board	01		CO3,RB2
3.9	IPC Mechanisms using pipes,FIFO, message queues, shared memory	T1	128	139	Black Board	01		CO3,RB3
	Review							

Signature of the HOD/Coordinator

	SRI INDU COLLEGE OF ENGINEERING & TECHNOLOGY **LESSON PLAN** **(Regulation :R22)** **DEPARTMENT OF AI-DS**	**Prepared on Feb' 2025**

Sub. Code & Title	**R22CSE2213 - Operating System**		
Academic Year: 2025-26	**Year/Sem.**	**II/I**	
Faculty Name & Designation	**Mr.R.MADHAVA REDDY , Assistant Professor**		

Unit/ Item No.	Topic (s)	Book Reference	Page (s) From	Page (s) To	Teaching Methodology	Proposed No. of Periods	Actual Date of Handled	CO/RBT
UNIT-IV (MEMORY MANAGEMENT AND VIRTUAL MEMORY)							**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	Black Board	01		CO4,RB5
4.8	Page Replacement Algorithms	T1	373	380	Black Board	02		CO4,RB3
	Review							

Signature of the HOD/Coordinator

	SRI INDU COLLEGE OF ENGINEERING & TECHNOLOGY **LESSON PLAN** **(Regulation :R22)** **DEPARTMENT OF AI-DS**	**Prepared on Feb' 2025**
	Sub. Code & Title | **R22CSE2213 - Operating System**	
	Academic Year: 2025-26 | **Year/Sem.** | **II/I**	
	Faculty Name & Designation | **Mr.R.MADHAVA REDDY , Assistant Professor**	

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

LIST OF TEXT BOOKS AND REFERENCES

TEXT BOOKS:

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

REFERENCE BOOKS:

1. Modern Operating Systems, Andrew S Tanenbaum 3rd Edition PHI.
2. Operating Systems A concept - based Approach, 2nd Edition, D. M. Dhamdhere, 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

	SRI INDU COLLEGE OF ENGINEERING & TECHNOLOGY **LESSON PLAN** **(Regulation :R22)** **DEPARTMENT OF AI-DS**	**Prepared on Feb' 2025**
	Sub. Code & Title | **R22CSE2213 - Operating System**	
	Academic Year: 2025-26 | **Year/Sem.** | **II/I**	
	Faculty Name & Designation | **Mr.R.MADHAVA REDDY , Assistant Professor**	

S.No.	Assignment Questions	Course Outcome	Books To be Referred	Date of Announcement	Date of Submission
1	Compare and Contrast the different types of OS which used in Systems.	CO-1	T-1		
2	Write about System calls with examples.	CO-1	T-1		

3	For the following example, calculate average waiting time and turnaround time for SJF and priority scheduling algorithms (Applying) Process Burst Time Priority P1 10 2 P2 29 3 P3 3 1 P4 7 4 P5 12 2	CO-2	R-1		
4	Examine the methods for handling Deadlock and its recovery.	CO3-4	T-1		
5	Draw the diagram of structure of page table?(Understanding)	CO-4	T-1		
6	Explain about sequential and indexed file access methods.(Understanding)	CO-5	T-1		
7	Explain LRU page replacement algorithm with this example.(Applying) 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	CO-4	T-1		
8	What are the different types of disk scheduling? (Remembering)	CO-5	T-1		
9	Examine Readers/Writers problem? (Analyzing)	CO-6	T-1		
10	Examine dining philosopher's problem and develop a solution using monitors? (Analyzing)	CO-6	T-1		

SELF STUDY TOPICS			
S.No.	**Topics**	**Books & Journals**	**Course Outcomes**

1	UNIX & LINUX	UNIX AND LINUX System Administration handbook by Evi Nemeth,Garth Snyder,Trent R.Hein	CO-6
2	Process Scheduling Algorithm	R1. Modern Operating Systems, Andrew S Tanenbaum 3rd Edition PHI.	CO-5

PREVIOUS YEAR QUESTION PAPER

MID-1 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)

(R20CSE2202) OPERATING SYSTEMS

Duration: 90Mins **Max Marks: 25M**

Section – A	
Answer *All* the questions	**5Qx1M = 5M**
1. Define operating systems.	
2. Explain different types of operating system services.	
3. What is distributed systems? What are the different types of distributed systems?	
4. What is meant by Real-Time system?	

5. What are the main objectives of operating system?
Section – B
Answer any *FOUR* questions **4Qx5M = 20M**
6. Discuss various components of operating system structure.
7. Define system calls and explain its types.
8. Explain in detail about OS services**.**

SRI INDU COLLEGE OF ENGINEERING& TECHNOLOGY

(An Autonomous Institution under UGC, New Delhi)
Recognizedunder2(f)and12(B)of UGCAct 1956

II B.Tech-I Semester–End Examinations (Model paper)
OPERATING SYSTEM
(COMMON TO AIDS,CSE(AI&ML),CSE(CS))

Duration: 3 Hrs **Max Marks: 70M**

Section – A

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

Section – B

Answerany *FIVE* questions choosing at least one from each Unit Marks: 5Qx10M = 50M			
	Marks	**Course Outcome**	**BT Level**
UNIT-I 6. Elaborate about operating system operations. **(OR)** 7. Define the following types of operating systems structure: i) Batch ii) Interactive iii) Time sharing iv) Real time v) Parallel vi) Distributed vii) Handheld.	10	CO1	4,1
UNIT-II 8. Consider the following four processes, with the length of the CPU burst given in milliseconds. Process Arrival Time Burst Time P1 0 8 P2 1 4 P3 2 9 P4 3 5 Calculate the average waiting time for (i) Pre-emptive SJF schedule (ii) non-pre-emptive SJF schedule. **(OR)** 9. List the attributes of the process. Describe the typical elements of process control block.	10	CO2	3,2
UNIT – III 10. a) Explain the steps involved in banker's algorithm. b) Explain about resource request algorithm. **(OR)** 11. How the deadlocks can be avoided? Explain it with the help of necessary algorithms.	10	CO3	5,1
UNIT – IV 12. Explain LRU page replacement algorithm with this example. Consider the following reference string 7,0,1,2,0,3,0,4,2,3,0,3,2,1,2,0,1,7,0,1 **(OR)** 13. What is paging? Explain the basic method for implementing paging?	10	CO4	3,1

UNIT – V 14. Illustrate layered-file system implementation? Mention the various file-directory structures. **(OR)** 15.Explain disk structure an disk scheduling	10	CO5	2

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

Subject code:**R20CSE2202**

SRIINDUCOLLEGE OF ENGINEERING& TECHNOLOGY

(An Autonomous Institution under UGC, New Delhi)
Recognizedunder2(f)and12(B)of UGCAct 1956

II B.Tech-I Semester–EndExaminations (Model paper)
OPERATING SYSTEM
(COMMON TO AI-DS,CSE(AI&ML),CSE(CS))

Duration: 3 Hrs **Max Marks: 70M**

Section – A

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

Section – B

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

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

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

	SRI INDU COLLEGE OF ENGG & TECH **QUESTION BANK** **(Regulation :R22)** **Department of AI-DS**	**(Regulation:R22)** **Prepared on : FEB' 2025**

Sub. Code & Title	**R22CSE2213 & OPERATING SYSTEMS**	
Academic Year : 202 - 26	**Year/Sem.**	**II/I**
Faculty Name & Designation		**R.MADHAVA REDDY& Asst.Prof**

QUESTION BANK WITH BLOOMS TAXONOMY LEVEL(BTL)
(1. REMEMBERING 2. UNDERSTANDING 3. APPLYING 4. ANALYSING 5. EVALUATING 6. CREATING)

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 (B) address of the I/O device involved (C) starting location in the main memory to read data from or write data to (D) number of words to be read or written (E) All of the above	I	CO1
1C - 6	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() (D) Sleep() (E) open()	I	CO1
1C - 13	Which of the operating system does not support modular structure? (A) UNIX (B) Solaris (C) MS-DOS (D) Linux (E) Window	I	CO1
1C - 14	Which of the following provides the interface for the user to get 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?	I	CO1

	(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		
	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 hardware and software.	I	CO1
1F - 13	A Control/Status register that contains the address of the next instruction to be fetched is called the _____.	I	CO1
1F - 14	The _____ is a device for staging the movement of data between main memory and processor registers to improve performance and is not usually visible to the programmer or processor.	I	CO1
1F - 15	A significant point about the _____ is that it contains sufficient information so that it is possible to interrupt a running process and later resume execution as if the interruption had not occurred.	II	CO1
	MATCH THE FOLLOWING		
1M - 1	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
1M - 2	1.Threads — a. Operating systems 2.Scheduling — b. FCFS 3.Process switch — c. Light weight process 4.Non preemptive — d. Mode switch	I	CO1
1M - 3	1.Kernel — a. Program 2.Device Programs — b. Heart of OS 3.Utility Programs — c. Concurrent Program 4.Supporting multitasking components — d. Software control Hardware 5.Supporting multiprocessing — e. System software designed to help	I	CO1

	analyses or maintain a computer			
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 Threads in operating system?		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 Process 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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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. (C) established only if processes share a common mailbox. (D)may be associated with many processes. (E) is associated with exactly one pair of communicating processes	I	CO2
2C - 6	A multicore system (A)supports multithreading. (B) multiple threads can execute concurrently. (C) improves system performance through multithreading. (D)sharing resources among threads is easier than shared memory. (E) All of the above.	I	CO2
2C - 7	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).	I	CO2

	(A) One (B) Two (C) Multiple (D) Depends on the structure of the thread (E) Depends on the structure of the CPU		
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. (E) None of the above.	I	CO2
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	I	CO2

	(E) A low-priority process will wait if a high-priority process arrives simultaneously		
	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 P4 3 5 Calculate the average waiting time for (i) Preemptive SJF schedule (ii) (ii) non-preemptive SJF scheduling	IV	CO2
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	Evaluate Resource –Request algorithm with suitable solution?.	V	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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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)? (A) Mutual exclusion (B) Progress (C) Bounded waiting (D) Mutual exclusion and Progress (E) Mutual exclusion, Progress, and Bounded waiting	I	CO3
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)	I	CO3

	{ /* critical section */ - - - - /* remainder section */ } (A) 0 (B) 1 (C) 2 (D) 3 (E) None of the above		
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	I	CO3

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

	SRI INDU COLLEGE OF ENGG & TECH **QUESTION BANK** **(Regulation :R22)** **Department of AI-DS**		**(Regulation:R22)** **Prepared on: FEB' 2025**
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UNIT – IV			
OBJECTIVE QUESTIONS			
SL.NO		**BT Level**	**Course Outcome**
4C - 1	The table contains the base address of each page in physical memory. a) process b) memory c) page d) frame	II	CO5
4C - 2	The instruction being executed, must be in _____ a) physical memory b) logical memory c) physical & logical memory d) none of the mentioned	II	CO5
4C - 3	The pager concerns with the _____ a) individual page of a process b) entire process c) entire thread d) first page of a process	I	CO5
4C - 4	Swap space exists in _____ a) primary memory b) secondary memory c) cpu d) none of the mentioned	I	CO5

4C - 5	Effective access time is directly proportional to _____ a) page-fault rate b) hit ratio c) memory access time d) none of the mentioned	I	CO5
4C - 6	In FIFO page replacement algorithm, when a page must be replaced a) 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 b) very high speed logic c) a large memory space d) none of the mentioned	II	CO5
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	I	CO5

	d) none of the mentioned		
	FILL IN THE BLANKS		
1F - 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 a. An address seen by the memory unit 2. Segmentation b. Fixed size blocks 3. Logical address c. Roll-out 4. Physical address d. Address generated by CPU 5. Swapping e. Variable size blocks	I	CO5
4M - 2	1. First fit a. Frame number + Page offset 2. Best fit b. Free hole 3. worst fit c. Page number+page offset 4. Logical address d. Smallest hole 5. Physical address e. Largest hole	I	CO5
4M - 3	1. Paging a. No internal fragmentation 2. Segmentation b. Internal fragmentation 3. Demand Paging c. Page hit 4. Page fault d. Global page replacement 5. Thrashing e. External fragmentation	II	CO5
4M - 4	1. Equal frame allocation a. Oldest page 2. Priority frame allocation b. Divide the no. of frames by process 3. Optimal page replacement c. New page 4. FIFO page replacement d. Replacing page 5. LRU page replacement e. Quantity of frames	II	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	III	CO5
5 – MARKS QUESTIONS				
4D - 1	Briefly explain about segmentation?		II	CO5
4D - 2	Explain LRU page replacement algorithm with this example.		II	CO5
4D - 3	Consider the following reference string 7,0,1,2,0,3,0,4,2,3,0,3,2,1,2,0,1,7,0,1 Assume there are three frames. Apply LRU replacement algorithm to the reference string above and find out how many page fonts are produced. Illustrate the LRU page replacement algorithm in detail and also two feasible implementation of the LRU algorithm		III	CO5
4D - 4	What is paging? Explain the basic method for implementing paging.		I	CO5
4D - 5	Describe about a) Contiguous memory allocation b) Fragmentation.		II	CO5
4D - 6	Illustrate about allocation of frames.		III	CO5
4D - 7	Explain FIFO page replacement algorithm necessary reference string? Consider the following reference string 7,0,1,2,0,3,0,4,2,3,0,3,2,1,2,0,1,7,0,1.		IV	CO5
4D - 8	Explain the various page replacement strategies.		I	CO5
4D - 9	What is demand paging and what are its uses?		I	CO5
4D - 10	Write about the techniques for structuring the page table.		I	CO5
4D - 11	What are the differences between? a) Logical and physical address? b) Page table and segment table? c) First-fit placement and best-fit placement?		I	CO5
4D - 12	Explain about page replacement algorithms?		I	CO5
4D - 13	Difference between segmentation paging and demand paging with an example?		V	CO5
4D - 14	What are the advantages and disadvantages of page replacement algorithms?		I	CO5
4D - 15	How can the system distinguish between the pages that are in main memory from the pages that are on the disk?		I	CO5

	SRI INDU COLLEGE OF ENGG & TECH **QUESTION BANK** **(Regulation :R22)** **Department of AI-DS**		**(Regulation:R22)** **Prepared on: FEB' 2025**
Sub. Code & Title	**R22CSE2213 & OPERATING SYSTEMS**		
Academic Year : 2025 - 26	**Year/Sem.**	**II/I**	
Faculty Name & Designation		**R.MADHAVA REDDY& Asst.Prof**	

QUESTION BANK WITH BLOOMS TAXONOMY LEVEL(BTL)
(1. REMEMBERING 2. UNDERSTANDING 3. APPLYING 4. ANALYSING 5. EVALUATING 6. CREATING)

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 b) all files must have unique names c) all files must have unique owners d) all of the mentioned	II	CO6
5C - 6	What is the disadvantage of the two level directory structure? a) it does not solve the name collision problem b) it solves the name collision problem c) it does not isolate users from one another d) it isolates users from one another	II	CO6
5C - 7	What is the main problem with access 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 d) none of the mentioned	I	CO6
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 a. No of disk blocks 2.Linked list b. FAT 3.Grouping c. No of free contiguous disk blocks 4.Counting d. Store no of blocks 5.File allocation table e. 0's & 1's	III	CO6
5M - 2	1. Read a. Writer or rewriting file 2. Write b. Deleting the file 3.Execute c. Reading from a file 4.Append d. Loading the file 5.Delete e. writes the new information to the already existing file	III	CO6
5M - 3	1.Iseek a. Input/Output control 2. Stat b. Read/Write file offset 3.Istat c. An open file 4.Fstat d. Returns data 5.Ioctl e. I-node Information	II	CO6
5M - 4	1. FCFS a. The disk arm again scan 2. SSTF b. The disk moves in a particular direction 3. SCAN c. Shortest seek time first 4. CSCAN d. First come first serve 5. LOOK e. Similar to the SCAN disk scheduling	II	CO6
5M - 5	1. Application programs a. Divided into various logical blocks 2.Logical file system b. First request is directed to the logical file system 3. File organization module c. CPU monitor 4. I/O control d. Module decided which physical block the application 5. Devices 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 queen 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	V	CO6

	cylinder 53 find the total head movement in cylinders. Also provide the necessary diagram to show the head movement for the above queue.		
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