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Course Code 

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**First Semester MCA Degree Examinations, November 2024**  
**OPERATING SYSTEM WITH UNIX**

Duration: 3 hrs

Max. Marks: 100

*Note:* 1. Answer any FIVE full questions, choosing ONE full question from each module.  
2. Missing data, if any, may be suitably assumed

<u>Q. No</u>	<u>Question</u>	<u>Marks</u>	<u>(RBTL:CO:PI)</u>
<b><u>MODULE – 1</u></b>			
1.	a. Define vi – editor. Explain with a neat diagram the 3 modes of vi – editor in detail.	08	(2:1:1.2.1)
	b. Explain the absolute and relative path names in UNIX.	06	(2:2:1.2.1)
	c. Explain the Unix File System.	06	(2:1:1.2.1)
<b>(OR)</b>			
2.	a. Explain the ls command with common options.	08	(2:1:1.2.1)
	b. Explain the various file permissions and directory permissions.	06	(2:3:1.2.1)
	c. Discuss the hard link and soft link in UNIX.	06	(2:2:1.2.1)
<b><u>MODULE – 2</u></b>			
3.	a. What is pattern matching in UNIX? Discuss the wild cards.	07	(2:2:1.2.1)
	b. Explain the three standard files? Explain grep command.	07	(2:3:1.2.1)
	c. Discuss pipes and tees in UNIX.	06	(2:2:1.2.1)
<b>(OR)</b>			
4.	a. What are the two special files in UNIX? Explain.	06	(2:2:1.2.1)
	b. What is process? Explain how to control the jobs and grep command with an example.	07	(2:3:1.2.1)
	c. Explain how the process is killed with signals.	06	(2:2:1.2.1)
<b><u>MODULE – 3</u></b>			
5.	a. Define operating system? Explain the abstract view of an operating system with a neat block diagram.	10	(2:2:1.2.1)
	b. Explain dual mode operation in operating system with a neat block diagram.	10	(2:3:1.2.1)
<b>(OR)</b>			
6.	a. List and explain the services provided by OS for the user and efficient operation of system.	10	(2:2:1.2.1)
	b. What are system calls? Briefly explain different types of system calls.	10	(2:3:1.2.1)
<b><u>MODULE – 4</u></b>			
7.	a. What is Process? Explain different states of a process with state/transition diagram and process control block.	10	(2:4:2.2.1)

- b. Consider the following set of processes, smaller number represents highest priority. Calculate the turn around and waiting time for FCFS, SJF and Priority scheduling. Draw Gantt Chart to explain. **10** (2:4:2.2.1)

Processes	Arrival Time	Burst Time	Priority
P1	0	8	4
P2	2	6	6
P3	2	10	3
P4	5	2	2

(OR)

8. a. What is inter process communication? Explain its types. Describe the implementation of inter process communication using shared memory and message passing. **10** (2:4:2.2.1)

- b. Consider the following processes **10** (2:4:2.2.1)

Processes	Arrival Time	Burst Time
P1	0	6
P2	1	3
P3	2	1
P4	3	4

Compute the waiting time and average turnaround time for the above processes using FCFS, SRTF and RR (Time Quantum = 2 ms) scheduling algorithm.

### MODULE – 5

9. a. What are the necessary conditions for deadlock to occur? How to recover from deadlocks. **10** (2:5:1.2.1)

- b. Consider the system with five processes P0 to P4 and three resource types A B and C. Suppose that, at time T0 the following is the snap shot of the system. Find the need matrix and calculate the safe sequence using banker's algorithm mention weather the system is in safe state or not. **10** (2:5:2.2.1)

Process	Allocation			Max			Available		
	A	B	C	A	B	C	A	B	C
P0	0	1	0	7	5	3	3	3	2
P1	2	0	0	3	2	2			
P2	3	0	2	9	0	2			
P3	2	1	1	2	2	2			
P4	0	0	2	4	3	3			

(OR)

10. a. What is segmentation? Explain basic method of segmentation with an example. **06** (2:5:1.2.1)

- b. What are Translation Load aside Buffer (TLB)? Explain TLB in detail with a simple paging system with a neat diagram. **08** (2:5:1.2.1)

- c. Given the memory partitions of 100 K, 500 K, 200 K, 300 K and 600 K apply first fit, best fit and worst fit algorithms to place 212 K, 417 K, 112 K and 426 K. **06** (2:5:2.2.1)

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