

Code No: **R20A0504****MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY****(Autonomous Institution – UGC, Govt. of India)****II B.Tech I Semester Supplementary Examinations, June 2025****Operating Systems
(CSE, IT & CSE-IOT)**

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Time: 3 hours**Max. Marks: 70**

Note: This question paper Consists of 5 Sections. Answer **FIVE** Questions, Choosing **ONE** Question from each SECTION and each Question carries 14 marks.

SECTION-I

- | | | | BCLL | CO(s) | Marks |
|---|----------|---|-------------|--------------|--------------|
| 1 | <i>A</i> | Illustrate layered architecture of Linux operating system. | L2 | CO-I | [7M] |
| | <i>B</i> | What are distributed systems? List its merits and demerits. | L1 | CO-I | [7M] |

OR

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|---|----------|---|-----------|-------------|-------------|
| 2 | <i>A</i> | What is an Operating system? List the services provided by an Operating System? | L1 | CO-I | [7M] |
| | <i>B</i> | Explain LINUX file handling utilities. | L2 | CO-I | [7M] |

SECTION-II

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|---|----------|--|-----------|--------------|-------------|
| 3 | <i>A</i> | Consider the following set of processes, with the length of the CPU burst given in milliseconds: | L3 | CO-II | [7M] |
|---|----------|--|-----------|--------------|-------------|

Process	Burst Time	Arrival Time
P1	3	0
P2	4	3
P3	3	7
P4	5	9
P5	7	12

Draw Gantt charts that illustrates the execution of these processes using the following scheduling algorithms: FCFS, SRTF and RR (quantum=3). Calculate average waiting time for each of these scheduling algorithms and identify the algorithm that has minimum average waiting time.

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|--|----------|--|-----------|--------------|-------------|
| | <i>B</i> | Differentiate between user-level threads and kernel-level threads? | L2 | CO-II | [7M] |
|--|----------|--|-----------|--------------|-------------|

OR

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|---|----------|--|-----------|--------------|-------------|
| 4 | <i>A</i> | Write a Shell script that accepts a filename, starting and ending line numbers as arguments and displays all the lines between the given line numbers. | L3 | CO-II | [7M] |
| | <i>B</i> | How do you pass arguments to a shell script? | L2 | CO-II | [7M] |

SECTION-III

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|---|----------|---|-----------|---------------|-------------|
| 5 | <i>A</i> | What is dining philosophers problem? Discuss the solution to dining philosopher's problem using monitors. | L3 | CO-III | [7M] |
| | <i>B</i> | Describe Critical Section problem? Give the conditions that a | L2 | CO-III | [7M] |

solution to the critical section problem must satisfy.

OR

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|--------------------------|----------|---|-----------|---------------|-------------|
| 6 | A | Discuss the following graphs and their role in deadlock
i) Resource Allocation Graph
ii) Wait For Graph | L2 | CO-III | [7M] |
| | B | Define is a deadlock? How deadlocks are detected? | L2 | CO-III | [7M] |
| <u>SECTION-IV</u> | | | | | |
| 7 | A | Demonstrate inter process communication using message passing. Discuss Related system calls. | L2 | CO-IV | [7M] |
| | B | How the inter process communication takes place using FIFOs? Discuss related system calls used in Linux. | L3 | CO-IV | [7M] |
| OR | | | | | |
| 8 | A | A process refers to 5 pages, A, B, C, D, and E in the order- A; B; C; D; A; B; E; A; B; C; D; E. If the page replacement algorithm is LRU, calculate the number of page faults with empty frames of size 4? | L3 | CO-IV | [7M] |
| | B | Explain in detail contiguous memory allocation technique. | L1 | CO-IV | [7M] |
| <u>SECTION-V</u> | | | | | |
| 9 | A | Discuss in detail about different file access methods. | L2 | CO-V | [7M] |
| | B | Discuss the two level directory structure with relevant diagram. | L2 | CO-V | [7M] |
| OR | | | | | |
| 10 | A | Discuss the contiguous allocation of disk space in file systems. | L2 | CO-V | [7M] |
| | B | Suppose the head of a moving head disk with 200 tracks, numbered 0 to 199, is currently serving a request at track 143 and has just finished a request at track 125.If the queue of requests is kept in FIFO order: 86, 147, 91, 177, 94, 150, 102, 175,130. What is the total head movement to satisfy these requests for the following disk scheduling algorithms?
(a) FCFS (b) C- SCAN | L3 | CO-V | [7M] |
