

2026

COMPUTER SCIENCE — MINOR

Paper : MN-4

(Operating System)

Full Marks : 75

The figures in the margin indicate full marks.

*Candidates are required to give their answers in their own words
as far as practicable.*

1. Answer **any five** questions : 2×5
- (a) Define multiprogramming OS.
 - (b) What do you mean by process scheduling?
 - (c) What do you mean by Process??
 - (d) Explain the concept of Deadlock.
 - (e) What is thrashing?
 - (f) What is the role of Kernel?
 - (g) What is the difference between thread and process?
 - (h) What do you mean by Dispatcher?

Section - A

Answer **any three** questions.

- 2. What do you mean by Paging? How is it different from Segmentation? 3+2
- 3. Discuss the five state process model with a neat diagram. 5
- 4. Explain memory hierarchy in operating systems with the help of a diagram. 5
- 5. Explain with a diagram, how virtual memory space can be greater than physical memory. 5
- 6. (a) State the necessary conditions for deadlock.
- (b) What do you mean by deadlock avoidance? 4+1

Please Turn Over

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Section - B

Answer *any five* questions.

7. (a) Explain the basic functions of Operating System.
 (b) Discuss real-time operating systems with suitable examples. 4+6
8. (a) Explain long-term scheduling and short-term scheduling.
 (b) Compare preemptive and non-preemptive scheduling algorithms. 4+6
9. Consider the following processes and answer the following question based on non-preemptive Shortest Job First (SJF) scheduling algorithm :

Process	Burst Time
P1	5 ms
P2	2 ms
P3	7 ms
P4	3 ms

All processes arrive at time 0.

- (a) Draw the Gantt chart.
 (b) Calculate the average waiting time. 4+6
10. (a) Explain inter-process communication (IPC).
 (b) Discuss semaphore with suitable example. 4+6
11. (a) Explain safe and unsafe state in the context of deadlock.
 (b) Explain Banker's (safety) Algorithm briefly. 6+4
12. (a) Differentiate between fixed partition and variable partition memory allocation.
 (b) Consider the following holes in order :
 10k, 4k, 20k, 18k, 7k, 9k, 12k, 15k
 Which hole is taken for successive request based on Best Fit and Worst Fit?
 i. 12k ii. 10k iii. 9k 4+(2+4)
13. (a) Explain virtual memory.
 (b) Discuss logical address and physical address space. 4+6
14. Write short notes on (*any two*) of the following : 5×2
- (a) Deadlock Prevention
 (b) Reader — writer Problems
 (c) Multilevel Feedback Queue Scheduling
 (d) File Protection.