

CBCS SCHEME

USN

18CS43

Fourth Semester B.E. Degree Examination, Dec.2024/Jan.2025 Operating Systems

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. Explain in detail about abstract view of the components of a computer system with a neat diagram. (10 Marks)
- b. Explain about computer system organization with a neat diagram. (10 Marks)

OR

- 2 a. Discuss briefly about operating system operations with diagram. (10 Marks)
- b. Discuss briefly about types of system calls with illustration. (10 Marks)

Module-2

- 3 a. Explain different types of multi threading modules with a neat diagram. (06 Marks)
- b. Explain Dining-philosopher's problem using monitors. (08 Marks)
- c. Explain various types of criteria for scheduling. (06 Marks)

OR

- 4 a. Explain three types of thread libraries. (06 Marks)
- b. Consider the following set of process. Draw Gantt charts and calculate average waiting time and average turn around time for i. non-preemptive SJF and preemptive SJF scheduling algorithms.

Process	Arrival Time	Burst Time
P1	0	8
P2	1	4
P3	2	9
P4	3	5

- c. Explain the Peterson's solution with its structure. (06 Marks)

Module-3

- 5 a. What is a deadlock? What are the necessary conditions for the deadlock to occur? (05 Marks)
- b. How to prevent the occurrence of deadlock, explain in detail. (05 Marks)
- c. Consider the following snapshot of a system:

Process	Allocation				Max				Available			
	A	B	C	D	A	B	C	D	A	B	C	D
P ₀	2	0	0	1	4	2	1	2	3	3	2	1
P ₁	3	1	2	1	5	2	5	2				
P ₂	2	1	0	3	2	3	1	6				
P ₃	1	3	1	2	1	4	2	4				
P ₄	1	4	3	2	3	6	6	5				

Answer the following using Banker's algorithm.

- i) Is the system in safe state? If so, give the safe sequence.
- ii) If process P₂ requests (0, 1, 1, 3) resources can it be granted immediately? (10 Marks)

OR

- 6 a. Explain paging hardware with TLB. (05 Marks)
b. Explain segmentation in detail. (05 Marks)
c. Discuss structure of page table with suitable diagrams. (10 Marks)

Module-4

- 7 a. Discuss briefly about demand – paging in memory management scheme. (10 Marks)
b. Discuss briefly about file attributes in a file system. (10 Marks)

OR

- 8 a. Explain in detail about various file operations in a file system. (10 Marks)
b. Explain in detail about various file types in a file system. (10 Marks)

Module-5

- 9 a. What is disk scheduling? Explain the following with a diagram:
i) FCFS ii) SSTF iii) SCAN. (10 Marks)
b. Write a short note on:
i) Linux file system ii) Linux process management. (10 Marks)

OR

- 10 a. Explain the several aspects of Disk management. (10 Marks)
b. Write a short note on:
i) Components of Linux system
ii) Process scheduling in Linux system. (10 Marks)
