CBCS SCHEME

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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

(08 Marks)

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 P_2 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)**

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