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B022315(022)

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B. Tech. (Third Semester) Examination, April-May 2022

(AICTE Scheme)

(Computer Science Engg. Branch)

OPERATING SYSTEMS

Time Allowed : Three hours

Maximum Marks : 100

Minimum Pass Marks: 35

Note : *Attempt all questions. Part (a) of each question is compulsory. Attempt any* ***two*** *from (b), (c) and (d) parts of each question. Part (a) carry 4 marks each and part (b), (c) and (d) carry 8 marks each.*

Unit-I

1. (a) Explain how an operating system tasks control?

(b) Explain operating system structure.

(c) What the various operating system services?

(d) Define multiprogramming and real time operating system.

Unit-II

2. (a) Demostrate race condition.

(b) Describe the objectives of Scheduling. Explain the structure of PCB.

(c) Explain semaphore. How can semaphore be used to Enforce mutual – exclusion? Give a suitable example to explain.

(d) Consider the following set of processes having their burst in ms. calculate the avg waiting time and turn-around time for SJF (non preemptive)

Process	Burst time	Arrival time
P1	10	0
P2	1	1
P3	2	2
P4	1	3
P5	5	4

Unit-III

3. (a) What is Deadlock? Draw suitable diagram.

(b) Explain dead lock avoidance algorithm.

(c) Analyze the following snapshot of a system.

	ALLOCATION			MAXIMUM			AVAILABLE		
	A	B	C	A	B	C	A	B	C
P0	0	1	0	7	5	3	2	3	0
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			

(i) Calculate the content of need matrix.

(ii) Is the system in a safe state?

(d) Explain Deadlock prevention in detail.

Unit-IV

4. (a) Define Virtual Address.

(b) Explain fragmentation with its types and solution.

(c) Consider the following page reference string

1, 1, 2, 2, 1, 4, 2, 3, 3, 5, 5, 4

Assume 3 page frame, calculate the page faults using following algorithm.

(i) FIFO

(ii) OPR

(d) Explain the concept of paging and segmentation.

Unit-V

5. (a) What is Address Binding?

(b) On a disk with 200 cylinders, compute the number of tracks the disk arm must move to satisfy all the request in the disk queue. Assume the current position is at 53 track are : 98, 183, 37, 122, 14, 124, 65, 67. Identify the total head movement for the following algorithm.

(i) FIFO

(ii) SSTF

(c) Describe file allocation methods.

(d) Write in detail about File Access Mechanism.