

5E5105

Roll No.

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B.Tech. V Semester (Main/Back) Examination, Nov./Dec. - 2017

Computer Science & Engineering

5CS5A Operating Systems

CS, IT

Time : 3 Hours

Maximum Marks : 80

Min. Passing Marks : 26

Instructions to Candidates :

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Attempt any **five** questions, selecting one question from each unit. All Questions carry **equal** marks. (Schematic diagrams must be shown wherever necessary. Any data you feel missing suitable be assumed and stated clearly). Units of quantities used/calculated must be stated clearly.

Unit - I

1. a) What is operating system? Explain its types and services provided by operating system in detail. (8)
- b) Explain the architecture of operating system with neat and clean diagram. (8)

OR

1. a) What you mean by process and lifecycle of process. Explain context switching between two processes. (8)
- b) What you mean by thread? Explain kernel and user level thread. (8)

Unit - II

2. a) What you mean by scheduling? Why scheduling is required? Differentiate the Preemption & Non-Preemption Scheduling? (8)
- b) Write short notes on the following : (2 × 4 = 8)
- i) Fair share scheduling
 - ii) Race condition
 - iii) Critical section
 - iv) Semaphore and mutex

OR

2. Consider the following four processes, with the length of the CPU burst time given in milliseconds. (16)

Process	Burst time (ms)	Arrival time (ms)
P0	15	0.0
P1	20	1.0
P2	3	2.0
P3	7	2.0

Consider the Shortest Remaining Time First (SRTF), Round Robin (RR) (Quantum = 5ms) scheduling algorithms. Illustrate the scheduling using Gantt chart. Which algorithm will give the minimum average waiting time?

Unit - III

3. a) What is deadlock? Explain the conditions and prevention of deadlock? (4)
- b) What is deadlock avoidance? Explain banker's algorithm with following SNAPSHOT of a system? Resource A = 3, B = 14, C = 12 and D = 12 instances. If P1 request 1 0 2 1 resource instance It can be granted or not?(12)

Allocation					Maximum				Available			
	A	B	C	D	A	B	C	D	A	B	C	D
P0	0	0	1	2	0	0	1	2	1	5	2	0
P1	1	0	0	0	1	7	5	0				
P2	1	3	5	4	2	3	5	6				
P3	0	6	3	2	0	6	5	2				
P4	0	0	1	4	0	6	5	6				

OR

3. a) What is memory allocation schemes? Explain with example. (8)
- b) What is thrashing? What do you understand by degree of multiprogramming.(8)

Unit - IV

4. a) What you mean by paging? Explain the concept of demand paging with proper diagram. (8)
- b) What is fragmentation? Differentiate between external and internal fragmentation. (8)

OR

4. Explain the FIFO, Optimal, LRU page replacement algorithm for the reference string. (16)

7 0 1 2 0 3 0 4 2 3 10 3.

Unit - V

- ✓ 5. a) Explain various disk scheduling algorithm in brief. (8)
- b) What are the various access methods for file system. (8)

OR

5. What do you mean by disk scheduling? Suppose the head of moving head disk is currently servicing a request at track 60. If the queue of request is kept in FIFO order. What is the total head movement to satisfy these requests for the following disk scheduling algorithm: (16)

- i) FCFS
- ii) SCAN
- iii) C-SCAN

REQUEST SEQUENCE	TRACK NUMBER
1	55
2	175
3	30
4	125
5	10
6	140

