

University of Mumbai

S.E Second Year 2014 - 2015 November

Semester 4 (SE Second Year)

Operating Systems

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QP Code : 14821

(3 Hours)

[Total Marks : 80

- N.B.: (1) Question No. 1 is compulsory.
 (2) Attempt any three from remaining questions.
 (3) Figures to the right indicate full marks.
 (4) Assume suitable data if necessary.

1. (a) What is operating system ? Explain different functions of O.S. 5
 (b) Explain role of process Control Block ? 5
 (c) What is the difference between dead lock prevention and avoidance algorithms. 5
 (d) Explain critical section problem. 5
2. (a) What are the different allocation methods with reference to File Systems ? 10
 (b) Consider the following set of processes, with the length of CPU burst given in milliseconds. 10

Process	Burst time	Priority
P ₁	10	3
P ₂	1	1
P ₃	2	3
P ₄	1	4
P ₅	5	2

The processes are assumed to have arrived in the order P₁, P₂, P₃, P₄, P₅ all at time 0. Draw Gantt charts for the following scheduling algorithms FCFS, SJF nonpreemptive priority) and RR (quantum = 1) and also calculate turn around time, average waiting time.

3. (a) Explain Dining philosopher problem and solution to it. 10
 (b) What do you mean by process ? Draw and explain process state diagram in Unix. 10

4. (a) Consider the following snapshot of a system --

	Allocation				Max				Available			
	A	B	C	D	A	B	C	D	A	B	C	D
P ₀	0	0	1	2	0	0	1	2	1	5	2	0
P ₁	1	0	0	0	1	7	5	0				
P ₂	1	3	5	4	2	3	5	6				
P ₃	0	6	3	2	0	6	5	2				
P ₄	0	0	1	4	0	6	5	6				

with reference to banker's algorithm

- (i) Find need matrix 2
- (ii) Is the system in a safe state ? 4
- (iii) If a request from process P₁ arrives for (0, 4, 2, 0), can the request be granted immediately. 4
- (b) Discuss various techniques for structuring the page tables along with example. 10
5. (a) Explain in details, file management in Linux. 10
- (b) Suppose that a disk drive has 5000 cylinders, numbered 0 to 4999. The drive is currently servicing a request at cylinder 143 and the previous request was at cylinder 125. The queue of pending requests, in FIFO order is 86, 1470, 913, 1774, 948, 1509, 1022, 1750, 130. 10
- Starting from the current head position, what is total distance (in Cylinders) that the disk arm moves to satisfy all the pending requests for each of the following disk scheduling algorithms
- (i) SCAN (ii) C-Look
6. Write note on the following :- 20
- (a) System components in Windows Operating System.
- (b) Demand paging and various page replacement policies.
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GN-Con. 5617-14.