

Code No: G0504/R13

M.Tech I Semester Supplementary Examinations, January-2017

OPERATING SYSTEMS
(Common to CS and CS&E)

Time: 3 hours

Max. Marks: 60

Answer any FIVE Questions
All Questions Carry Equal Marks

1.
 - a What is an operating system? Explain different types of operating systems. 6
 - b What is a system call? Explain different system calls. 6
2.
 - a What is a process? Explain different states of process with neat diagram. 4
 - b Consider the following set of processes, with the length of the CPU burst given in milliseconds: 8

<u>Process</u>	<u>Burst Time</u>	<u>Priority</u>
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.

- i. Draw four Gantt Charts that illustrate the execution of these processes using the following scheduling algorithms: FCFS, SJF, non-preemptive priority (a smaller priority number implies a higher priority), and RR (quantum=1).
- ii. What is the turnaround time of each process for each of the scheduling algorithms in part a?
- iii. What is the waiting time of each process for each of these scheduling algorithms?
- iv. Which of the algorithms results in the minimum average waiting time(over all processes)?

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3. a What is synchronization? Explain its importance. 4
b What is readers and writers problem? Give the solution to it using monitors. 8
4. a What is a deadlock? Discuss the necessary conditions to exist a deadlock. 4
b Apply the deadlock detection algorithm to the following data and determine whether the deadlock occur or not for process P1, P2 and P3 with resources R1,R2,R3 and R4 8
- Available=(2 1 0 0)
Request = $\begin{pmatrix} 2 & 0 & 0 & 1 \\ 1 & 0 & 1 & 0 \\ 2 & 1 & 0 & 0 \end{pmatrix}$, Allocation = $\begin{pmatrix} 0 & 0 & 1 & 0 \\ 2 & 0 & 0 & 1 \\ 0 & 1 & 2 & 0 \end{pmatrix}$
5. a What is memory management? Explain the First fit, best fit, and Worst-fit in detail. 6
b What is virtual memory? Explain operating system Fetch policy for Virtual memory. 6
6. Explain the disk structure and different disk scheduling algorithms with suitable examples. 12
7. a What is a File? Explain file structure and access methods in detail. 8
b Explain the free space management. 4
8. a Explain the goals of protection. Also explain how OS protects processes from each other. 8
b What is firewall? Explain how it can used to protect Systems and networks. 4
