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

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 P_1, P_2, P_3, P_4, P_5 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 Available=(2 1 0 0) Request = $\begin{pmatrix} 2 & 0 & 0 & 1 \\ 1 & 0 & 1 & 0 \\ 2 & 1 & 0 & 0 \end{pmatrix}$, Allocation = $\begin{pmatrix} 0 & 0 & 1 & 0 \\ 2 & 0 & 0 & 1 \\ 0 & 1 & 2 & 0 \end{pmatrix}$	8
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

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