

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 <sub>1</sub>	10	3
P <sub>2</sub>	1	1
P <sub>3</sub>	2	3
P <sub>4</sub>	1	4
P <sub>5</sub>	5	2

The Processes are assumed to have arrived in the order P<sub>1</sub>, P<sub>2</sub>, P<sub>3</sub>, P<sub>4</sub>, P<sub>5</sub> 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)?

**Code No: G0504/R13**

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

\*\*\*\*\*