Sardar Patel Institute of Technology

Bhavan's Campus, Munshi Nagar, Andheri (West), Mumbai-400058, India

(Autonomous College Affiliated to University of Mumbai)

End Semester Examination

May – 2018

Max. Marks: 100 **Duration: 3 Hours**
Class:TE **Semester: VI**
Course Code:ETC605 **Branch:EXTC**
Name of the Course: Operating Systems

Instruction:
(1) All questions are compulsary
(2) Draw neat diagrams
(3) Assume suitable data if necessary

Q No.		Max. Marks	CO
Q.1 (a)	What is Kernel? Discuss different types of kernels.	10	CO1
Q.1 (b)	List all the fields of Process Control Block (PCB). State clearly the necessity of each of these fields.	10	CO2
Q.2 (a)	Consider a following set of processes, with length of CPU bursts given in milliseconds as follows:	10	CO2

Process	Burst Time	Arrival Time	Priority
P1	8	0	3
P2	1	1	1
P3	2	2	2
P4	3	3	3
P5	6	4	4

1. Draw the Gantt charts for FCFS, Preemptive SJF, Preemptive priority and RR (Quantum=2)
2. What is the waiting time of each process for each of the above algorithms?
3. What is the turnaround time of each process for each of the above algorithms?
4. Which algorithm results in the minimum average waiting time?

OR

Q.2 (a)	Consider a following set of processes, with length of CPU bursts given in milliseconds as follows: 1. Draw the Gantt charts for FCFS, Preemptive SJF, Preemptive priority and RR (Quantum=2) 2. What is the waiting time of each process for each of the above algorithms? 3. What is the turnaround time of each process for each of the above algorithms? 4. Which algorithm results in the minimum average waiting time?	10	

Process	Burst Time	Arrival Time	Priority
P1	8	0	3
P2	4	1	4
P3	9	2	2
P4	5	3	1

Q.2 (b)	In UNIX, each file is associated with inode. File allocation is an important operation required to use the space efficiently and to access it with high speed. Justify the use of inode in order to satisfy these two requirements. Support your answer with neat diagram of the inode structure.	10	CO3
	OR		
Q.2 (b)	Discuss security features in UNIX OS.	10	CO3
Q.3 (a)	Discuss, with respect to Linux OS, the virtual memory management scheme (Paging scheme).	10	CO3
	OR		
Q.3 (a)	With respect to Linux OS, Draw and discuss the process state transition diagram.	10	CO3
Q.3 (b)	Consider the following page reference string: 1,2,3,4,2,1,5,6,2,1,2,3,7,6,3,2,1,2,3,6 How many page faults would occur for the following replacement algorithms, assuming four page frames? Remember that all frames are initially empty, so your first unique pages will cost one page each. 1. FIFO 2. LRU 3. OPTIMAL	10	CO2
Q.4 (a)	Compare and contrast various allocation methods for files. Justify the answer with examples.	10	CO2
Q.4 (b)	Compare and contrast various Disks Arm Scheduling algorithms. Justify the answer with examples. Calculate average seek time in each of the algorithms.	10	CO2

Q.5 (a)	Give an example of Priority inversion, and how to overcome for a three task system.	10	CO3
Q.5 (b)	Consider a system with two tasks, which we'll call Task 1 and Task 2. Assume these are both periodic tasks with periods T1 and T2, and each has a deadline that is the beginning of its next cycle. Task 1 has P1 = 50 ms, and an execution time of C1 = 25 ms. Task 2 has P2 = 100 ms and C2 = 40 ms. Consider static priority scheduling (RMA), draw the time space diagram and calculate processor utilization, schedulability.	10	CO3