Sardar Patel Institute of Technology

Bhavan's Campus, Munshi Nagar, Andheri (West), Mumbai-400058
(An Autonomous Institute Affiliated to University of Mumbai)

End Semester Examination- Synoptic

May 2019

Max. Marks: 60 **Duration: 3 Hours**
Class: SE **Semester: IV**
Course Code: CE43/IT44 **Branch: CMPN/IT**
Name of the Course: Operating Systems

Instructions:
(1) All Questions are Compulsory
(2) Draw neat diagrams
(3) Assume suitable data if necessary

Question No.		Max. Marks	CO
Q 1 (a)	Explain various objectives and functions of Operating System. **Answer:** **1 mark for each objective*4=4 marks** **1 mark for each function*2= 2 marks**	6	CO 1
Q 1 (b)	Differentiate between fork and exec system calls. **Answer:** **1 mark for each correct difference*6=6 marks** OR Differentiate between Monolithic and Micro-Kernel. **Answer:** **1 mark for each correct difference*6=6 marks**	6	CO 1

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Q2	Consider the following set of processes with length of CPU burst given in milliseconds. All processes arrive at time 0. Draw Gantt charts for scheduling using a) Round Robin with time quantum = 2 ms and b) Priority Scheduling.(Lower the number higher the priority) Also calculate Average Turnaround Time and Average waiting Time. Process Burst Time Priority P1 10 3 P2 1 1 P3 2 4 P4 1 5 P5 5 2 **Answer:** **Gnatt chart = 2 marks** **Turn Around time= 2 marks** **Waiting time = 2 marks** **RR:** **ATAT= 9.6 ms** **AWT= 6 ms** P1 P2 P3 P4 P5 P1 P5 P1 P5 P1 P1 0 2 3 5 6 8 10 12 14 15 17 19 **Priority Scheduling:** **ATAT= 12 ms** **AWT=8.2 ms** P_2 P_5 P_1 P_3 P_4 0 1 6 16 18 19	12	CO2
Q3 (a)	Illustrate Producer Consumer Problem. **Answer:** **Code of producer and consumer = 3 marks** **Explanation of Producer and Consumer = 3 marks** OR Analyze the necessary conditions for deadlock **Answer:** **1.5 mark for each condition*4=6 marks**	6	CO3
Q3(b)	Explain various levels of RAID. **Answer:** **1 mark for each level*6=6 marks**	6	CO2
Q4 (a)	Differentiate between paging and segmentation. **Answer:** **1 mark for each correct comparison*6=6 marks**	6	CO4

Q4(b)	Compare various file allocation methods. **Answer:** **2 mark for each file allocation method*3=6 marks** OR Describe I-node Structure in detail. **Answer:** **Diagram of I-node = 3 marks** **Explanation of I-node = 3 marks**	6	C O 5

Q5	Consider a reference string: 4, 7, 6, 1, 7, 6, 1, 2, 7, 2. the number of frames in the memory is 3. Find out the number of page faults respective to: 1. Optimal Page Replacement Algorithm 2. FIFO Page Replacement Algorithm 3. LRU Page Replacement Algorithm **Answer:** **3 marks for steps in each algorithm*3=9 marks** **1 mark for each correct answer*3=3 marks**	12	C O 4

Optimal page replacement

Request	4	7	6	1	7	6	1	2	7	2
Frame 3			6	6	6	6	6	2	2	2
Frame 2		7	7	7	7	7	7	7	7	7
Frame 1	4	4	4	1	1	1	1	1	1	1
Miss/Hit	Miss	Miss	Miss	Miss	Hit	Hit	Hit	Miss	Hit	Hit

Number of Page Faults in Optimal Page Replacement Algorithm = 5

LRU

Request	4	7	6	1	7	6	1	2	7	2
Frame 3			6	6	6	6	6	6	7	7
Frame 2		7	7	7	7	7	7	2	2	2
Frame 1	4	4	4	1	1	1	1	1	1	1
Miss/Hit	Miss	Miss	Miss	Miss	Hit	Hit	Hit	Miss	Miss	Hit

Number of Page Faults in LRU = 6

FIFO

Request	4	7	6	1	7	6	1	2	7	2
Frame 3			6	6	6	6	6	6	7	7
Frame 2		7	7	7	7	7	7	2	2	2
Frame 1	4	4	4	1	1	1	1	1	1	1
Miss/Hit	Miss	Miss	Miss	Miss	Hit	Hit	Hit	Miss	Miss	Hit

Number of Page Faults in FIFO = 6