Sardar Patel Institute of Technology

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

(Autonomous College Affiliated to University of Mumbai)

End Semester Re-examination

January – 2020

Max. Marks: 100 Duration: 3 Hours

Class:TE Semester: V

Course Code:ETC605 Branch:EXTC

Name of the Course: Operating System

Instruction:

(1) All questions are compulsory

(2) Draw neat diagrams

(3) Assume suitable data if necessary

Q No.		Max. Marks	CO
Q.1 (a)	Discuss the necessity of a typical desktop operating system stating the parameters supported by it in detail.	10	CO1
Q.1 (b)	Each process requires Process Control Block (PCB). Justify by drawing a typical format of PCB with necessary fields and its functions.	10	CO2
Q.2 (a)	For any hypothetical OS, list the states in the process. Hence, discuss the working of these states with their transitions with the help of a diagram.	10	CO3
Q.2 (b)	Consider a following set of processes, with length of CPU bursts given in milliseconds as follows:	10	CO2

Process	Burst Time	Arrival Time
P1	10	0
P2	29	0
P3	3	0
P4	7	0
P5	12	0

Draw the Gantt charts for FCFS, Non Preemptive SJF and RR (Quantum=10) What is the waiting time of each process for each of the above algorithms? What is the turnaround time of each process for each of the above algorithms? Which algorithm results in the minimum average waiting time?

OR

<table>
<tr><td>Q.2 (b)</td><td>Consider a following set of processes, with length of CPU bursts given in milliseconds as follows:

<table><tr><th>Process</th><th>Burst Time</th><th>Arrival Time</th></tr><tr><td>P1</td><td>14</td><td>0</td></tr><tr><td>P2</td><td>8</td><td>0</td></tr><tr><td>P3</td><td>21</td><td>0</td></tr><tr><td>P4</td><td>10</td><td>0</td></tr></table>
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<tr><td>Q.2 (b)</td><td>For any hypothetical OS, list the states in the process. Hence, discuss the working of these states with their transitions with the help of a diagram.</td><td>10</td><td>CO3</td></tr>
<tr><td>Q.3 (a)</td><td>Discuss the mechanism of translating the virtual address to its respective physical address for a particular operating system. Consider the concept of paging.

OR

In desktop systems, the files are appropriately allocated space. Explain various method to achieve this task with their comparisons.</td><td>10

10</td><td>CO3

CO3</td></tr>
<tr><td>Q.3 (b)</td><td>Consider the following page reference string: 7,0,1,2,0,3,0,4,2,3,0,3,2,1,2,0,1,7,0,1 How many page faults would occur for the following replacement algorithms, assuming three page frames? Remember that all frames are initially empty, so your first unique pages will cost one page each. FIFO LRU OPTIMAL</td><td>10</td><td>CO2</td></tr>
<tr><td>Q.4 (a)</td><td>Design the file structure of a typical file system.</td><td>10</td><td>CO2</td></tr>
<tr><td>Q.4 (b)</td><td>Compare and contrast various disk scheduling algorithms.</td><td>10</td><td>CO2</td></tr>
<tr><td>Q.5 (a)</td><td>Compare and contrast scheduling algorithms in a typical Real time embedded system.</td><td>10</td><td>CO3</td></tr>
<tr><td>Q.5 (b)</td><td>Consider a system with three tasks, which we'll call Task 1, Task 2 and Task 3. Assume all are periodic tasks with periods T1, T2 and T3. Each has a deadline that is the beginning of its next cycle. Task 1 has P1 = 4 ms, C1 = 1 ms, Task 2 has P2 = 10 ms, C2 = 2 ms and Task 3 has P3 = 15 ms, C3 = 4 ms. Consider static priority scheduling (RMA), draw the time space diagram and calculate processor utilization, schedulability.</td><td>10</td><td>CO3</td></tr>
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