K. J. Somaiya College of Engineering, Mumbai-77
(Autonomous College Affiliated to University of Mumbai)
Semester: Jul 2018- Nov 2018

Max. Marks: 30 **Duration: 1hr.15 min.**

Class: TY.BTech **Semester:V**

Branch: COMP **Course Code:** UCEC501

Test 1 **Name of the Course:** Operating System

<table>
<tr><th>Question No.</th><th></th><th>Max. Marks</th><th>*CO Mapped</th><th>Bloom's Taxonomy</th></tr>
<tr><td>Q.1</td><td>Explain the Unix architecture with the help of Diagram.</td><td>5M</td><td>CO1</td><td>Comprehension</td></tr>
<tr><td>Q.2</td><td>A . Enlist the different states and state transitions in 7 state model.
B. For the set of processes given below,
<table><tr><th>Process</th><th>Arrival Time</th><th>Service Time</th></tr><tr><td>P1</td><td>0</td><td>3</td></tr><tr><td>P2</td><td>2</td><td>4</td></tr><tr><td>P3</td><td>4</td><td>6</td></tr><tr><td>P4</td><td>6</td><td>5</td></tr><tr><td>P5</td><td>8</td><td>2</td></tr></table>i. Draw the 5state Process Queuing model considering following:
Length of ready queue : 04
Length of Blocked queues: 02
a. Process P1 blocks on event E1 at time 2
b. Process P2 blocks on event E2 at 5
c. Process P3 blocks on event E3 at 14
ii. List contents of all queues before and after time t=6</td><td>3M

5M</td><td>CO2</td><td>Analysis</td></tr>
<tr><td>Q.3</td><td>What is the purpose of System calls, and how do system calls relate to the OS and to the concept of dual mode (kernel-mode and user-mode) operations?</td><td>4M</td><td>CO1</td><td>Comprehension</td></tr>
</table>

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<tr>
<td>Q.4</td>
<td>Consider the following workload in a Unix OS:
<table>
<tr><th>Process</th><th>Burst Time (ms)</th><th>Priority</th><th>Arrival Time(ms)</th></tr>
<tr><td>P1</td><td>50</td><td>4</td><td>0</td></tr>
<tr><td>P2</td><td>20</td><td>1</td><td>20</td></tr>
<tr><td>P3</td><td>100</td><td>3</td><td>40</td></tr>
<tr><td>P4</td><td>40</td><td>2</td><td>60</td></tr>
</table>
Show the schedule using Shortest remaining time, non-preemptive priority, HRRN Round robin (q=30ms)
a. Use time scale diagram to show the schedule for each requested scheduling policy.
b. Calculate :
i. the waiting time and Turnaround time for each process
ii. average waiting time and Turnaround for the requested scheduling policy</td>
<td>10M</td>
<td>CO3</td>
<td>Application</td>
</tr>
<tr>
<td>Q.5</td>
<td>Draw Process Control Block enlisting all its elements.</td>
<td>3M</td>
<td>CO2</td>
<td>Comprehension</td>
</tr>
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