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

Test2 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>Define producer consumer problem. Propose a solution to it using binary Semaphores. (Assume necessary data)</td><td>10M</td><td>CO4</td><td>Knowledge/ Application</td></tr>
<tr><td>Q.2</td><td>a. Explain necessary conditions for Deadlock?

b. Consider the system with 3 processes and three types of resources with the following data:

<table>
<tr><td colspan="4">Resource Vector</td></tr>
<tr><td rowspan="2">R =</td><td>A</td><td>B</td><td>C</td></tr>
<tr><td>5</td><td>5</td><td>3</td></tr>
</table>

<table>
<tr><td colspan="4">Allocation Matrix</td><td colspan="4">Need Matrix</td></tr>
<tr><td></td><td>A</td><td>B</td><td>C</td><td></td><td>A</td><td>B</td><td>C</td></tr>
<tr><td>P1</td><td>2</td><td>1</td><td>1</td><td>P1</td><td>1</td><td>1</td><td>0</td></tr>
<tr><td>P2</td><td>2</td><td>1</td><td>1</td><td>P2</td><td>2</td><td>0</td><td>1</td></tr>
<tr><td>P3</td><td>1</td><td>2</td><td>0</td><td>P3</td><td>0</td><td>1</td><td>0</td></tr>
</table>

Run the deadlock avoidance algorithm on the above example. And check if the system is in deadlock? If yes, What are the process(s) that need to be preempted and in what order, to ensure that deadlock is overcome?</td><td>4M

6M</td><td>CO4</td><td>Comprehension

Application</td></tr>
<tr><td>Q.3</td><td>Assume a disk with 200 tracks and that the disk request queue has random requests in it. Requested tracks, in the order received by the disk scheduler, are 55, 58, 39, 18, 90, 160, 150, 38, 184.
If the disk head is currently positioned at track number 50, calculate average seek time for the above set of requests for :
a. SSTF b. SCAN (Direction : Left to Right)
Show graphically the head movements for both the algorithms.</td><td>10M</td><td>CO5</td><td>Analysis</td></tr>
</table>