BHARATIYA VIDYA BHAVAN'S

SARDAR PATEL INSTITUTE OF TECHNOLOGY

MUNSHI NAGAR, ANDHERI (WEST), MUMBAI – 400 058, India
(Autonomous College Affiliated to University of Mumbai)

RE_Examination

Max. Marks: 60
Class: FYMCA
Course Code: MCA21
Subject: Operating System

Duration: 3 hr
Semester: II
Date:03/01/20
Time: 10 to 1

Instructions: (1) All questions are compulsory.
(2) Use of scientific calculator is allowed.
(3) Assume any necessary data but justify the same.

<table>
<tr><th>Q. No.</th><th>Questions</th><th>Max. Marks</th><th>CO-BL-PI</th></tr>
<tr><td>Q1</td><td>a) Illustrate various services provided by OS

b) Explain concept of paging in detail.</td><td>6

6</td><td>1-2-1.3.1

3-2-1.3.1</td></tr>
<tr><td>Q2</td><td>a) Consider below table of seven processes with their arrival burst time and priority
<table>
<tr><th>Process</th><th>Priority</th><th>AT</th><th>BT</th></tr>
<tr><td>P1</td><td>2(L)</td><td>0</td><td>4</td></tr>
<tr><td>P2</td><td>4</td><td>1</td><td>2</td></tr>
<tr><td>P3</td><td>6</td><td>2</td><td>3</td></tr>
<tr><td>P4</td><td>10</td><td>3</td><td>5</td></tr>
<tr><td>P5</td><td>8</td><td>4</td><td>1</td></tr>
<tr><td>P6</td><td>12(H)</td><td>5</td><td>4</td></tr>
<tr><td>P7</td><td>9</td><td>6</td><td>6</td></tr>
</table>
Find Average waiting time and Average Turn Around time by using preemptive priority scheduling

OR

a) Consider the system with 6 processes .Use Round Robin CPU Scheduling algorithm with Time Quantum=2 to calculate Average Turnaround Time and Average Waiting Time?
<table>
<tr><th>Process</th><th>Arrival Time</th><th>Burst Time</th></tr>
<tr><td>P1</td><td>0</td><td>4</td></tr>
<tr><td>P2</td><td>1</td><td>5</td></tr>
<tr><td>P3</td><td>2</td><td>2</td></tr>
<tr><td>P4</td><td>3</td><td>1</td></tr>
<tr><td>P5</td><td>4</td><td>6</td></tr>
<tr><td>P6</td><td>6</td><td>3</td></tr>
</table>
b) Explain Multilevel queue scheduling with Example.</td><td>8

8

4</td><td>2-3-2.1.3

2-3-2.1.3

2-2-1.3.1</td></tr>
</table>

<table>
<tr><td>Q3</td><td>a) State how does semaphores solve:
1. Reader Writer Problem
2. Producer Consumer Problem

OR

a) Consider a system with 4 processes and 3 resource types: A,B and C
<table>
<tr><td></td><td>Allocation</td><td>Max</td><td>Available</td></tr>
<tr><td>Process</td><td>A B C</td><td>A B C</td><td>A B C</td></tr>
<tr><td>P0</td><td>0 1 0</td><td>7 5 3</td><td>3 3 2</td></tr>
<tr><td>P1</td><td>2 0 0</td><td>3 2 2</td><td></td></tr>
<tr><td>P2</td><td>3 0 2</td><td>9 0 2</td><td></td></tr>
<tr><td>P3</td><td>2 1 1</td><td>2 2 2</td><td></td></tr>
<tr><td>P4</td><td>0 0 2</td><td>4 3 3</td><td></td></tr>
</table>
Using Banker's Algorithm
1. Find the content of Need Matrix
2. Is the system in safe state? If so, Give safe sequence.

b) State the necessary conditions to solve critical section problem</td><td>4
4

8

4</td><td>2-2-1.3.1
2-2-1.3.1

2-3-2.1.3

2-2-1.3.1</td></tr>
<tr><td>Q4</td><td>a) Explain Contiguous memory allocation method in detail

b) Consider a reference string: 7,0,1,2,0,3,0,4,2,3,0,3,2,1,2,0,1,7,0,1.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

OR

b) Consider the following disk request sequence for a disk with 200 cylinders. 23, 89, 132, 42, 187 .Head pointer starting at 100 and moving in left direction. Find the number of head movements in cylinders using:
1. FCFS
2. SSTF
3. SCAN</td><td>6

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6</td><td>3-2-1.3.1

3-3-2.1.3

3-3-2.1.3</td></tr>
<tr><td>Q5</td><td>a) Discuss and Compare different File Allocation Methods (based on their technique, advantages, and disadvantages)

OR

a) Explain RAID in detail

b) State the goals, principles and domain of protection</td><td>6

6

6</td><td>4-2-1.3.1

4-2-1.3.1

4-2-1.3.1</td></tr>
</table>