BMSCOLLEGEOF ENGINEERING,BANGALORE-19

(Autonomous Institute,AffiliatedtoVTU)

Department Name: Computer Science and Engineering

INTERNALS-II

CourseCode: 19CS4PCOPS	**CourseTitle: Operating System**	
Semester:IV	**MaximumMarks:40 Marks**	**Date: 01/06/2020**
Faculty Handling the Course:	Pradeep S, Dr. B G Prasad, Shyamala G	

Instructions: ***Internal choice is provided in Part C.***

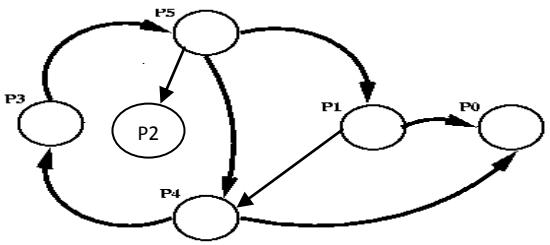
PART-A

Total 5 Marks (No choice)

No.	Question	Marks
1	Define semaphores. Explain different types of semaphores with example.	5

PART-B

Total 15 Marks (No Choice, each question of 5 marks)

No.	Question	Marks
2a)	Given that process P1 has a period of p1=60 and a CPU burst of t1= 30 and Process P2 has a period of p2= 90 and t2=40. Apply Rate Monotonic and Earliest-Deadline-First Scheduling and show the Gantt chart.	5
2b)	For the given wait-for graph (i) Construct the resource allocation graph (ii) Infer the sequence for deadlock, if present 	5
2c)	Memory partitions of 100KB , 500KB, 200KB, 300KB, 600KB (in order) are available. How would first-fit and best-fit algorithms place processes of 212KB, 417KB, 112KB and 426 KB (in order)?	5

PART- C

Total 20 marks (Choice between 3a or 3b and 4a or 4b)

<table>
<tr><th>No.</th><th>Question</th><th>Marks</th></tr>
<tr><td>3a)</td><td>i)Develop a Pseudo code for Producer & Consumer Process for solving Bounded-buffer problem.
ii)Write a Pseudo code for wait and signal operation using structured variable</td><td>10M</td></tr>
<tr><td colspan="3">OR</td></tr>
<tr><td>3a)</td><td>Calculate Average Waiting time and Average Turnaround time for the following processes below
<u>Processes Cpu Burst TimePriority</u>
P1 2 2
P2 1 1
P3 8 4
P4 4 2
P5 5 3
Processes are arrived in the order p1,p2,p3,p4,p5All at time 0. Draw Gantt chart and solve for the following scheduling types
a)NonPreemptive SJF
b) Priority(higher num has highest priority)
c)Round robin(Time quantum=2 msec)</td><td>10M</td></tr>
<tr><td>4a)</td><td>Solve using Banker’s algorithm considering the following snapshot of a system
<table>
<tr><th rowspan="2">Processes</th><th colspan="4">Allocation</th><th colspan="4">Max</th><th colspan="4">Available</th></tr>
<tr><th>A</th><th>B</th><th>C</th><th>D</th><th>A</th><th>B</th><th>C</th><th>D</th><th>A</th><th>B</th><th>C</th><th>D</th></tr>
<tr><td>P_0</td><td>0</td><td>0</td><td>1</td><td>2</td><td>0</td><td>0</td><td>1</td><td>2</td><td>1</td><td>5</td><td>2</td><td>0</td></tr>
<tr><td>P_1</td><td>1</td><td>0</td><td>0</td><td>0</td><td>1</td><td>7</td><td>5</td><td>0</td><td colspan="4" rowspan="4"></td></tr>
<tr><td>P_2</td><td>1</td><td>3</td><td>5</td><td>4</td><td>2</td><td>3</td><td>5</td><td>6</td></tr>
<tr><td>P_3</td><td>0</td><td>6</td><td>3</td><td>2</td><td>0</td><td>6</td><td>5</td><td>2</td></tr>
<tr><td>P_4</td><td>0</td><td>0</td><td>1</td><td>4</td><td>0</td><td>6</td><td>5</td><td>6</td></tr>
</table>
Answer the following:
i) What is the content of the need matrix?
ii) Illustrate that the system is in safe state by demonstrating an order in which the processes may complete?
iii) If a request from process P1 arrives for (0, 4, 2, 0) can the request be granted immediately?</td><td>10</td></tr>
<tr><td colspan="3">OR</td></tr>
</table>

4b)	Explain with a neat diagram the working of Translation Look aside Buffer used for address translation. Calculate the effective access time for the given data. TLB Access Time – 15 ns Memory Access Time – 100 ns Hit Ratio – 80%	10