Number of printed pages:02

Semester IV (B.Tech)

Er. No. 201B308

Academic Year: 2021-22

Jaypee University of Engineering & Technology, Guna

T-3 (Even Semester 2022)

18B11CI413 - OPERATING SYSTEMS

Maximum Duration: 2 Hours

Maximum Marks: 35

Notes:

1. This question paper has five questions.
2. Write relevant answers only.
3. Do not write anything on a question paper (Except your Er. No.).

Q1. Describe a mechanism for enforcing memory protection in order to prevent a program from modifying the memory associated with other programs. **Marks [06]**

Q2. Consider the following set of processes, with the length of the CPU burst given in milliseconds: **[07]**

Process	Burst Time	Priority
P1	10	3
P2	1	1
P3	2	4
P4	1	5
P5	5	2

(a) Show the scheduling order of the processes using the Gantt chart.
(b) What is the turnaround time for each process?

Q3. How does the signal() operation associated with monitors differ from the corresponding operation defined for semaphores? **[07]**

Q4. Consider the following snapshot of a system: **[08]**

Process	Allocation				Max			
	A	B	C	D	A	B	C	D
P0	3	0	1	4	5	1	1	7
P1	2	2	1	0	3	2	1	1
P2	3	1	2	1	3	3	2	1
P3	0	5	1	0	4	6	1	2
P4	4	2	1	2	6	3	2	5

Using the banker's algorithm, determine whether or not each of the following states is unsafe. If the state is safe, illustrate the order in which the processes may complete. Otherwise, illustrate why the state is unsafe.

(a) Available = (0,3,0,1)

(b) Available = (1,0,0,2)

Q5. Consider the following page reference string: **[07]**

7,2,3,1,2,5,3,4,6,7,7,1,0,5,4,6,2,3,0,1

Assuming demand paging with three frames, how many page faults would occur for the following replacement algorithms?

(a) LRU replacement

(b) FIFO replacement

(c) Optimal Replacement