Name:

Enrolment No:

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
End Semester Examination, May 2022

Course: Operating Systems
Semester: II
Program: MCA **Time: 03 hrs.**
Course Code: CSEG 7012 **Max. Marks: 100**

Instructions:

SECTION A
(5Qx4M=20Marks)

S. No.		Marks	CO
Q 1	Explain the concept of context switching in operating systems.	**4**	**CO1**
Q 2	Discuss how long term schedulers control the degree of multiprogramming in a system.	**4**	**CO2**
Q 3	Explain the rollback process in deadlock recovery.	**4**	**CO3**
Q 4	What are the criteria of selecting a victim process during deadlock recovery?	**4**	**CO3**
Q 5	Explain race condition with an example.	**4**	**CO2**

SECTION B
(4Qx10M= 40 Marks)

6.	Differentiate between multi-computer and multi-processor systems.	**10**	**CO1**
7.	Explain the Bounded Buffer problem in detail with the help of pseudo code.	**10**	**CO2**
8.	Find out if the following system is in deadlock for the given system snapshot. If not, then what is/are the possible safe sequence(s)? If it is in deadlock, then name the processes, which has, lead it to deadlock. Consider resource type *A* is having 10 instances, *B* is having 5 instances and *C* is having 7 instances. *Allocation Request Available* *A B C* *A B C* *A B C* P_0 0 1 0 0 0 0 0 0 0 P_1 2 0 0 2 0 2 P_2 3 0 3 0 0 0 P_3 2 1 1 1 0 0 P_4 0 0 2 0 0 2	**10**	**CO3**

	OR Find out the possible number of safe states for the following system snap shot where resource type *A* is having 10 instances, *B* is having 5 instances and *C* is having 7 instances *Process* *Allocation* *Max* *Available* *A B C* *A B C* *A B C* P_0 0 1 0 7 5 3 3 3 2 P_1 2 0 0 3 2 2 P_2 3 0 2 9 0 2 P_3 2 1 1 2 2 2 P_4 0 0 2 4 3 3		
9.	Perform (a) FCFS and (b) SJF on the given set of processes and find out the average turnaround and waiting times for both the cases. Process Burst Time Arrival Time P1 10 5 P2 8 3 P3 12 0	**10**	**CO2**
	SECTION-C **(2Qx20M=40 Marks)**		
10.	(a). Consider the following page reference string -1, 2, 3, 4, 1, 2, 5, 1, 2, 3, 4, 5. How many page faults would occur for the following page replacement algorithm, assuming three frames? (all frames are initially empty) I) FIFO Replacement II) LRU Replacement. III) Optimal Page Replacement . (b). Explain the process of paging with necessary diagrams for page table and main memory. Explain in details, why effective access time reduces while implementing part of the page table with associative registers.	**10+10**	**CO4**

11.	Consider a disk has 200 cylinders, numbered from 0 to 199. At some time the disk arm is at cylinder 100, and moving towards right direction. There is a queue of disk access requests for cylinders 30, 85, 110, 100, 105, 126, 135, 55 and 195. Show the disk head movement with diagram using FCFS, SSTF, C-LOOK and C-SCAN scheduling algorithms. Calculate the total head movements. OR (a) Discuss the rationale behind choosing a proper disk scheduling algorithm. (10) (b) Describe the process of DMA with necessary schematic diagram. (10)	**20**	**CO5**