Name:

Enrolment No:

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UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
End Semester Examination, December 2019

Course: Operating Systems **Semester: III**
Program: BCA **Time 03 hrs.**
Course Code: CSBC 2003 **Max. Marks: 100**

Instructions: attempt all questions

SECTION A

S. No.		Marks	CO
Q 1	State and explain the process of context switching	**4**	**CO2**
Q 2	Discuss the booting process sequence in order to explain how operating system takes control on computer system.	**4**	**CO1**
Q 3	Explain the various ways Inter Process Communication can be carried out.	**4**	**CO2**
Q 4	Differentiate between batch processing and multiprogramming OS.	**4**	**CO1**
Q 5	Perform round robin scheduling on the following. Find out the Average waiting time and average response time. Process Arrival Time Burst Time P_1 0.0 10 P_2 1.0 6 P_3 3.0 4 P_4 5.0 2	**4**	**CO2**

SECTION B

Q 6	State and explain the Semaphore Solution for the Producer Consumer problem.	**10**	**CO4**
Q 7	Assuming a 1 KB page size, what are the page numbers and offsets for the following address references (provided as decimal numbers): a. 21375 e. 16138 b. 1936 f. 23345 c. 3000 g. 11222 d. 25611 h. 11822	**10**	**CO3,CO5**
Q 8	Explain a directory system and in what different ways directories can be implemented.	**10**	**CO5**
Q 9	Consider the following page reference string -1, 2, 3, 4, 5, 5, 3, 4, 1, 6, 7, 8, 7, 8, 9, 7, 8, 9, 5, 4, 5, 4, 2. How many page faults would occur for the following replacement algorithm, assuming three frames? (all frames are initially empty) I) LRU Replacement II) Optimal Replacement **OR**	**10**	**CO3**

	What is the cause of thrashing? How does the system detect thrashing? Once it detects thrashing, what can the system do to eliminate this problem?		
	SECTION-C		
Q 10	Consider the disk queue with I/O requests on the following cylinders in their arriving order: 67, 12, 15, 45, 48, 50, 109, 89, 56, 59, 34, 88, 130, 24. The disk head is assumed be at cylinder 80 and moving in the direction of increasing number of cylinders. The disk consists of total 150 cylinders. (a)Show the disk head movement with diagram using FCFS, SSTF, LOOK and C-SCAN scheduling algorithms. Calculate the total head movements. (b)Requests on cylinders 60, 85, and 90 arrive while processing at 50. What will happen to these new requests according to all the above scheduling algorithms? **OR** 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.	**20**	**CO5**
Q11	For the given state of resources. Perform the safety algorithm and identify a safe sequence. 5 processes P_0 through P_4; 3 resource types: A (10 instances), B (5 instances), and C (7 instances). Snapshot at time T_0: 		Allocation	Max	Available
	A B C	A B C	A B C
P_0	0 1 0	3 5 3	3 3 2
P_1	2 0 0	3 2 2	
P_2	3 0 2	4 0 2	
P_3	2 1 1	2 2 2	
P_4	0 0 2	2 3 3	| How (and why) will you handle a) request of (0 1 0) by P_2 b) request of (2 0 1) by P_4.	**20**	**CO3**