UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
Online End Semester Examination, December 2020

Course: Operating System   **Semester: III**
Program: Bachelor of Computer Applications (IoT+BFSI)   **Time 03 hrs.**
Course Code: CSBC 2003   **Max. Marks: 100**

SECTION A
1. **Each question will carry 5 Marks**
2. **Complete the statements / Select the correct answers**

S. No.		CO
Q 1	Multiprogramming operating systems are _____ in nature.	**CO1**
Q 2	In busy waiting resource is wasted in form of _____.	**CO2**
Q 3	A bit map can tell if (a) A particular location of memory is occupied. (b) A particular location of memory is free. (c) Both a and b. (d) None of the above.	**CO3**
Q 4	Paging gives rise to _____ fragmentation, whereas, segmentation gives rise to _____.	**CO3**
Q 5	The average waiting time, applying SJF CPU scheduling on three processes of burst times as 24, 3 and 3 is ____.	**CO2**
Q 6	A Process Control Block of a process needs to be _____ before preempting the process.	**CO1**

SECTION B
1. **Each question will carry 10 Marks**
2. **Instruction: Write short / brief notes. Make diagrams wherever needed.**

Q 7	What are Semaphores? What are their types? Show how semaphores may be used for process synchronization. (1+2+7).	**CO2**
Q 8		**CO4**
Q 9	Find out the number of page hits achieved while using LRU page replacement algorithm for the following reference string 1, 2, 3, 4, 1, 2, 5, 1, 2, 3, 4, 5. Take frame size as equal to 4.	**CO3**
Q 10	Discuss about the process of selecting an appropriate disk scheduling algorithm.	**CO4**

Q 11	With the help of pseudocode explain the first reader-writer problem.	CO1

SECTION-C

1. **Each question carries 20 Marks**
2. **Instruction: Write long answers. Make diagrams wherever needed.**

Q 12	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	

	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	

OR

Find out the possible number of safe states for the following system snap shot where resource type A is having 7 instances, B is having 2 instances and C is having 6 instances **CO5**

	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	