SLOT – D2

VIT

Vellore Institute of Technology

SCHOOL OF INFORMATION TECHNOLOGY AND ENGINEERING

CONTINUOUS ASSESSMENT TEST – II - WINTER SEMESTER 2019-2020

Programme Name & Branch: B.TECH IT	**Class Number(s): VL2019205004456**
Course Name Code: ITE2002	**Course Name: Operating System**
Faculty Name(s): Dr. P.J.Kumar **Exam Mode: Closed book**	**Semester: Winter 19-20**
Exam Duration: 90 mins	**Maximum Marks: 50**

S.No.	Question
1.	i) Illustrate race condition with an example. (4 Marks) ii) A file named "Namebase.DB" can be allowed for reading by a set of processes named READERS. But it can be allowed for writing by only one process named WRITER. Let the READERS and WRITER process to access the file in their corresponding critical section. Restrict the READERS count to 6 at a time. Illustrate with a pseudocode the synchronization mechanism needed for the above scenario with suitable semaphores. (6 Marks).
2.	**a)** Identify the various locations where a page table can be implemented. Enumerate the merits and demerits with each options. (6 Marks) circular wait, hold & wait preemptio **b)** List the essential conditions for the occurrence of deadlock. Illustrate the process of detecting deadlock using a resource allocation graph.(4 Marks)
3.	Resource Types: A(15), B(9), C(9) Consider the following snapshot.

Process	Allocation			Max			Available		
	A	B	C	A	B	C	A	B	C
P1	2	1	2	3	3	3	4	2	1
P2	1	3	2	5	7	8			
P3	2	0	1	3	2	3			
P4	2	1	1	5	3	3			
P5	4	2	2	4	5	3			

a) Calculate the total number of resources/instances currently allocated to all processes and currently available resources/instances. (1 Mark)

b) Calculate the need matrix (1 Mark)

c) Find whether the system is in safe state or not. (4 Marks)

d) If P2 request for (4, 2, 1), is it a valid request and can it be granted immediately? Provide the safe sequence if it can be granted. (4 Marks)

S.No.	Question
4.	**Elaborate the following terms in the context of virtual memory.** **Demand Paging and Pure Demand Paging** **Pager and Zero-Fill On Demand** **Shared Pages and Copy on Write** **Thrashing** **Frame Allocation**
5	**4 2 3 1 5 6 2 1 6 7 4 2 1** **For the above page reference string, calculate the number of page faults for each of the following page replacement algorithms with frame count as 4 and 6.** **i) FIFO ii)OPR iii) LRU**