Reg. No.:

Name :

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TERM END EXAMINATIONS (TEE) – December 2021					
Programme	**:**	**B.Tech – BCE, BCG**	**Semester**	**:**	**Fall 2021-22**
Course Name	**:**	**Operating System**	**Course Code**	**:**	**CSE3003**
Faculty Name	**:**	**Dr. Abha Trivedi**	**Slot / Class No**	**:**	**B21+B22+B23/0437**
Time	**:**	**1½ hours**	**Max. Marks**	**:**	**50**

Answer ALL the Questions

Q. No.		Question Description	Marks

PART - A (30 Marks)

1 (a) How can you relate "Operating System" with a "Toy Shop Manager"? Present your understanding based on different services provided by the OS. (10)

OR

(b) Apply your understanding to show the CPU switching sequence between two processes (P1 and P2) with the help of a neat and clear diagram. Also, illustrate the use of PCB during the switching process. (10)

2 (a) Why is deadlock state more critical than starvation? Also, illustrate Resource Allocation Graph: (10)

(2+ 4+4)

a) with a cycle and deadlock

b) with a cycle but no deadlock.

OR

(b) You are using dynamic contiguous memory allocation with a memory user space of 2000K. These are the processes P1=430K, P2=312K, P3=517K, P4=95K and P5=226 K arrived. Allocation should be done in the given order of arrival. Answer the following: (10)

a) Show the allocation and leftover memory space. 3

b) P6=200K arrived, can it be allocated? If yes where and how much will be the leftover memory space now. 2

c) Let's say, P2 and P5 left (emptied the location). P7=150K arrived, where it can be accommodated among all the free spaces if using First Fit, Best Fit and Worst Fit? (Show separate diagram for each) 3

d) After allocation done in (c), with whichever scheme, if P8=325K arrived will it lead to internal fragmentation or external fragmentation? Justify. 2

3 (a) The queue of requests for the disk access with 200 tracks by the processes is: (10)

80, 180, 22, 163, 112, 50, 11, 135

Current head position is 70. What is the total head movement needed to satisfy the requests for the following Scheduling algorithms SSTF and C-LOOK (for C-LOOK, R/W head initiate its movement towards the increasing track number)? 5 5

OR

(b) Distinguish among the following: (10)

i) Reposition, Delete and Truncate file operations 5

ii) Single level, Two level and Tree Directory structures 5

PART - B (20 Marks)

4 Given table shows the state of system at certain time ***t***,

Process	**Max**				**Allocation**				**Available**		
	A	B	C		A	B	C		A	B	C
P0	**3**	**2**	**2**		**1**	**0**	**1**		**2**	**1**	**3**
P1	**4**	**5**	**1**		**1**	**3**	**0**				
P2	**2**	**1**	**6**		**0**	**1**	**4**				
P3	**8**	**0**	**3**		**4**	**0**	**2**				
P4	**0**	**7**	**4**		**0**	**2**	**1**				

(10)

Using Banker's algorithm, answer the following questions:

A. How many resources of type A, B and C are there? 3
B. What are the contents of need matrix? 3
C. Find if the system is in safe state at time ***t***? If it is, find the safe sequence 4

5 Assuming there are 4 frames and the page reference string is (10)

3 2 1 3 4 1 6 2 4 3 4 2 1 4 5

Compute number of page faults and number of hits with the following page replacement algorithms: LRU and Optimal. Also, give the hit ratio and page fault ratio. 5 5

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