



44672/C0220

Reg. No.

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**III Semester B.C.A. 5 Degree Examination, April - 2022****OPERATING SYSTEM****(Repeater/Regular)****Time : 3 Hours****Maximum Marks : 80****Instructions to Candidates:**

- 1) *All Sections are Compulsory.*
- 2) *Draw diagrams wherever necessary.*

**SECTION - A****I. Answer the following questions:****(10×2=20)**

1. a) Define System Call. List its types.
- b) What is Spooling?
- c) Define context switching.
- d) Differentiate between user - level and Kernel level threads.
- e) Define Scheduler. List its type.
- f) Define critical section.
- g) Define Deadlocks.
- h) Define Swapping.
- i) Define Fragmentation.
- j) Define Demand paging.
- k) List Operations of Files.
- l) Define Bit Vector.

**SECTION - B****II. Answer the following questions.****(4×5=20)**

2. Explain features of Multiprogramming operating system.
3. Explain PCB.
4. Explain Dining philosopher's problem for synchronization.
5. Explain Deadlock prevention.

**[P.T.O.]**





- 6. Explain steps for handling page faults.
- 7. Explain FCFS Disk scheduling Algorithm.

**SECTION - C**

III. Answer the following questions. (4×10=40)

- 8. a) Explain Real Time Operating System.  
b) Explain System call.
- 9. Consider the following set of processes, with the length of CPU Burst time given in milliseconds.

Process	Burst time
P <sub>1</sub>	3
P <sub>2</sub>	1
P <sub>3</sub>	3
P <sub>4</sub>	4
P <sub>5</sub>	2

- i) Draw Gantt Charts illustrating the execution of these processes using FCFS and Round Robin (quantum time = 1msec) scheduling methods.
- ii) Calculate the average waiting time and average turnaround time for both of these scheduling method.
- 10. Consider the following snapshot of a system.

	Allocation				Max				Available			
	A	B	C	D	A	B	C	D	A	B	C	D
P <sub>1</sub>	0	0	1	2	0	0	1	2	1	5	2	0
P <sub>2</sub>	1	0	0	0	1	7	5	0				
P <sub>3</sub>	1	3	5	4	2	3	5	6				
P <sub>4</sub>	0	6	3	2	1	6	5	2				
P <sub>5</sub>	0	0	1	4	0	6	5	6				



Answer the following questions using the Banker's Algorithm.

- i) What is the content of the 'Need' Matrix?
  - ii) Is the system in Safe State?
  - iii) If a request from process P1 arrives for (0, 4, 2, 0) can the request be granted immediately.
11. a) Explain Internal and External Fragmentation.
- b) Consider the following page reference string.  
1, 0, 7, 1, 0, 2, 1, 2, 3, 0, 3, 2, 4, 0, 3, 0, 2, 1, 0, 7.  
Calculate how many pages faults would occur for FIFO and LRU replacement algorithms assuming 3 frames (initially all are free)
12. The requested tracks in the order received are:  
76, 124, 17, 269, 201, 29 and 137. Apply the following Disk scheduling Algorithms.
- a) SSTF                      b) C-SCAN
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