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**BACHELOR OF TECHNOLOGY (C.B.C.S.) (2020 COURSE)**  
**B.Tech.Sem - IV CS&E :SUMMER- 2022**  
**SUBJECT : SYSTEM PROGRAMMING & OPERATING SYSTEM**

Day : Thursday  
Date : 16-06-2022

**S-24304-2022**

Time : 10:00 AM-01:00 PM  
Max. Marks : 60

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**N.B.:**

- 1) All questions are **COMPULSORY**.
  - 2) Figures to the right indicate **FULL** marks.
  - 3) Draw diagrams wherever necessary.
  - 4) Use of Scientific Calculator is allowed
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**Q.1** Explain TWO PASS assembler along with its diagram. What is the need of Symbol Table (ST) and Literal Table(LT) in two PASS assembler. (10)

**OR**

**Q.1** What is forward reference? How it is handled in single pass assembler. Write algorithm of PASS-1 of Two PASS assembler. (10)

**Q.2** What is LEX? Explain working of LEX. Write a LEX program to recognize identifiers, numbers, keywords and relational operators used in c program. (10)

**OR**

**Q.2** Explain different function of loader. What are types of loaders? Explain compile and go loader scheme with advantage and disadvantages using suitable example. (10)

**Q.3** Draw Gantt chart and calculate Avg. Turnaround time, Avg. waiting time for the following processes using, SJF (non-preemptive) scheduling and round robin with quantum 2 (10)

Process	Arrival Time	Burst Time
P1	0	6
P2	1	4
P3	4	8
P4	3	3

**OR**

**Q.3** What is operating system? Explain different types of OS. Also explain various system calls in OS. (10)

**Q.4** Explain in detail: (10)

- i) Dining Philosopher Problem.
- ii) Producer Consumer Problem.

**OR**

**Q.4** Explain Banker's algorithm in detail. Find out the safe sequence for execution of 3 processes using Banker's algorithm maximum resources (10)

R1=4, R2= 4

Allocation Matrix

	R1	R2
P1	1	0
P2	1	1
P3	1	2

Maximum Requirement Matrix

	R1	R2
P1	1	1
P2	2	3
P3	2	2

**Q.5** Consider the page reference string 1,2,3,4,2,3,4,5,6,7,3,2,4 calculate page fault and hit ratio for FIFO, LRU and Optimal. (frame size = 3) (10)

**OR**

**Q.5** Explain the following concepts in detail. (10)

- i) Swapping.
- ii) Virtual memory system.
- iii) Segmentation.

**Q.6** Write a note on (10)

- i) Disk Access method.
- ii) Directory structure.

**OR**

**Q.6 a)** What is file system? Explain file system information in brief. (05)

**b)** Explain types of File Organization. (05)

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