[5460] - 587
T.E. (Computer Engg.)
SYSTEM PROGRAMMING AND OPERATING SYSTEM
(2015 Pattern)

Time : 2½ Hours]   *[Max. Marks :70*

Instructions to the candidates:

1) *Solve Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6, Q.7 or Q.8, Q.9 or Q.10.*
2) *Neat diagrams must be drawn wherever necessary.*
3) *Assume suitable data if necessary.*
4) *Figures to the right indicate full marks.*

Q1) a) Define following terms   **[5]**

     i)   Token

     ii)   Lexeme

     iii)   Pattern

     iv)   String

     v)   Alphabet

    b) Explain advance macro facilities using suitable example.   **[5]**

<div align="center">OR</div>

Q2) a) Give complete design of Direct linking Loader.   **[6]**

    b) Explain MNT, MDT, MDTP, and ALA with respect to macro processor using example?   **[4]**

Q3) a) Draw a neat flowchart of pass - I of two pass assembler and explain it. **[5]**

    b) Explain "General loading scheme (using suitable diagram)" with advantages and disadvantages.   **[5]**

<div align="center">OR</div>

<div align="right">***P.T.O.***</div>

Q4) a) Give complete design of Absolute Loader with suitable example. **[6]**

b) Differentiate between compiler and interpreter? **[4]**

Q5) a) Explain use of process control block and all fields in brief. **[6]**

b) Draw Gantt chart and calculate Avg. turnaround time, Avg. waiting time for the following processes using SJF non preemptive and round robin with time quantum 2. **[6]**

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

c) Write Banker's algorithm and explain with suitable example. **[6]**

OR

Q6) a) Explain various process states with suitable process state diagram. **[6]**

b) Consider following status of system, compute need of each process and check given state is safe or unsafe using Bankers algorithm. Also check, if P3 generates new request (0, 1, 0, 0) system is safe or unsafe and request is granted or not? **[8]**

	MAX_CLAIM				ALLOCATED			
	R1	R2	R3	R4	R1	R2	R3	R4
P1	0	0	1	2	0	0	1	2
P2	2	7	5	0	2	0	0	0
P3	6	6	5	6	0	0	3	4
P4	4	3	5	6	2	3	5	4
P5	0	6	5	2	0	3	3	2

Currently Available Resources →

R1	R2	R3	R4
2	1	0	0

c) What are necessary conditions for deadlock? Explain them with example. **[4]**

Q7) a) What is Thrashing? Explain in brief. **[4]**

b) Compare contiguous and non - contiguous memory allocation. **[3]**

c) What is virtual memory? Explain Demand paging with example. **[6]**

d) Explain segmentation using suitable example in brief. **[3]**

OR

Q8) a) What is fragmentation? Explain types of fragmentations with suitable diagram/example. **[5]**

b) Write a note of swapping. **[5]**

c) Consider given page sequence a, b, c, d, c, a, d, b, e, b, a, b, c, d and the size of the frame is 4. Show the output of LRU and Optimal policies, also count page faults. **[6]**

Q9) a) What is file system? Explain file system implementation in brief. **[4]**

b) Consider the disk access requests given as 55, 58, 39, 18, 90, 160, 150, 38, 184, where starting head position is - 100. Calculate average seek time using FCFS, SSTF, SCAN and C - SCAN disk scheduling policies and show which policy performs better. **[12]**

OR

Q10) a) Explain following terms with respect to directory structure. **[8]**

i) Two level directory structure (use suitable diagram)

ii) Tree structured directories (use suitable diagram)

b) What is I/O Buffering? Explain its type in detail. **[8]**

♦♦♦♦