

COMPUTER ORGANIZATION & OPERATING SYSTEMS

Time: 3 Hours

Max. Marks: 70

Question Paper consists of FIVE units, each carrying 14 marks
Each unit has TWO questions; either of them should be answered
All parts of a question must be answered at one place.

UNIT-I

1. a) What is a stack? What is the need for stack memory in computers? Discuss the organization of stack. 7M
b) Discuss merits and demerits of multiprocessor and multicomputer. 7M

(OR)

2. a) An instruction is stored at location 300 with its address field at location 301. The address field has the value 400. A processor register R1 contains the number 200. Evaluate the effective address if the addressing mode of the instruction is 7M
i) direct ii) immediate iii) relative iv) register indirect
v) index with R1 as the index register
b) "The performance of the computer program execution is affected by the design of its hardware and machine language instructions"- Prove and Justify the statement. 7M

UNIT-II

3. a) Explain about micro programmed control organization with neat sketch. 7M
b) Explain about the shift micro-operations with an example 7M

(OR)

4. a) Hardwired control unit is faster than micro programmed control unit. Justify this statement. 7M
b) What is instruction cycle? Briefly explain with the help of diagram? 7M

UNIT-III

5. a) Consider the following set of processes, with the length of the CPU burst given in milliseconds: 7M

Process	Burst Time	Priority
P1	27	5
P2	12	1
P3	37	2
P4	19	4
P5	10	3

The processes are assumed to have arrived in the order P1, P2, P3, P4, P5 all at time 0.

Draw the Gantt charts that illustrate the execution of these processes using the following scheduling algorithms: FCFS, SJF and Priority. Also determine the average waiting time and average turnaround time for each of the algorithms.

- b) What is a process? Explain about various fields of Process Control Block. 7M

(OR)

6. a) Explain about the process states with neat sketch. 7M
b) Discuss about the different types of system calls are used in the operating System. 7M

UNIT-IV

7. a) Describe Monitor. Explain solution to dining philosopher's problem using Monitor. 7M
b) Is it possible to apply the Resource allocation graph algorithm to avoid deadlock? Explain. 7M

(OR)

8. a) What is Peterson's solution to solve critical section problem? 7M
b) Explain Deadlock detection algorithm with an example. 7M

UNIT-V

9. a) What is directory structure which is suitable for sharing of files? Justify your answer. 7M
Illustrate with an example.
b) Illustrate the page-replacement algorithms i) LRU ii) LRU-Approximation Page 7M
Replacement use the reference string 7, 0,1, 2, 0, 3, 0, 4, 2, 3, 0, 3, 2,1, 2, 0, 1, 7, 0,1 for a
memory with three frames.

(OR)

10. a) Define Seek time. Assume that a disk drive has 200 cylinders numbered from 1 to 199. The 7M
drive is currently serving a request at cylinder 100. The queue of pending requests is 23,
89, 132, 42, 189. Calculate seek time for FCFS and SSTF disk scheduling algorithms.
b) Explain about the structure of Page table. 7M