

Roll No.

Total Pages:
10429

**MCA(6/7)/D-12
OPERATING SYSTEM
Paper-MCA-304**

Time allowed: 3 hours

Maximum marks: 80

Note: There are nine questions in this paper. Attempt five questions in all. Question no. 1 is compulsory. Attempt remaining four questions selecting only one question from Each unit.

Compulsory Question

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|---|---|
| 1. (a) What is the purpose of command interpreter? | 3 |
| (b) Define the terms Starvation and Convoy effect. | 3 |
| (c) What is the meaning of term busy-waiting? Can it be avoided altogether? | 3 |
| (d) What do you understand by linear ordering on resources? Give example. | 3 |
| (e) Explain the difference between Internal and External Fragmentation. | 3 |
| (f) What data structure can be used for directory information? | 3 |
| (g) What is sector queuing algorithm used? | 3 |
| (h) Describe the file access levels provided with UNIX. | 3 |

Unit-I

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| 2. Discuss different types of operating systems, giving their differences and advantages in Detail. | 14 |
| 3. (a) Differentiate the following terms: Thread, Process, Procedure and Program. | 6 |
| (b) Define the following scheduling algorithms for processes, by choosing appropriate Arrival & processing times:
(i) FCFS (ii) SJF (iii) SRT, and (iv) RR(TQ = 1) | 8 |

Unit-II

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| 4. (a) Differentiate the terms 'Critical region' and 'Mutual exclusion'. | 4 |
| (b) Discuss synchronization mechanism provided by Windows operating system. | 5 |
| (c) Define the dining Philosopher Problem & suggest a solution that ensures freedom From deadlocks. | 5 |
| 5. (a) Define Deadlock. State the necessary conditions for occurrence of deadlock with The help of examples/diagrams. | 6 |
| (b) Spooling systems are often prone to deadlock. Explain. | 3 |
| (c) Write a short note on Deadlock Recovery. | 5 |

Unit-III

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| 6. (a) Write short note on the following:
(i) File protection mechanism, and
(ii) Hierarchy of the file and device management. | |
| (b) How file systems are maintained in Windows and LINUX? Discuss. | 7 |
| 7. (a) Differentiate the terms 'Paging' and 'Demand paging'. How demand paging can Have significant effect on the performance of computer system? | 3+5 |
| (b) Discuss LRU and NRU page replacement algorithms by choosing an appropriate Example. | 6 |

Unit-IV

8. (a) How do cache help improve performance? Why do systems not use more or larger Caches if they are so useful? 3
- (b) What problem could occur if a system allowed a file system to be mounted simultaneously at more than one location? 3
- (c) On a disk with 200 cylinders (number 0 to 199), suppose the disk arm is currently at cylinder number 118. Assume that the head is moving towards 199, and the pending requests are for cylinder number 81, 142, 86, 172, 89, 145, 98, 170, 125, receive in that order. Compare the performance of the following disk scheduling algorithms:
(i) SSCF (ii) SCAN (iii) LOOK 8
9. Write short notes on any three of the following:
- (a) RAID structure.
- (b) Distributed Operating systems.
- (c) Revocation of Access Rights.
- (d) LINUX – System Administration. 14