

**Q.P. Code : 588702**

( 3 Hours) [ Total Marks : 80

- N.B. :** (1) Question No.1 is **compulsory**.  
 (2) Attempt **any three** questions out of remaining **five** questions.  
 (3) Assume suitable data whenever required but justify the same.  
 (4) Assumption made should be clearly stated.

1. (a) Explain different file operations in brief. 5  
 (b) What are the characteristics of Real Time OS? 5  
 (c) What is system call? Explain any five system calls. 5  
 (d) Differentiate between Deadlock avoidance & Deadlock prevention. 5
  
  2. (a) Explain process-thread state transition diagram in linux. 10  
 (b) Explain clearly how UNIX performs file management using I-nodes. 10
  
  3. (a) Explain clearly paging and segmentation based memory management techniques using diagram. 10  
 (b) What critical section of a process? Describe two solutions to achieve mutual Exclusion of critical sections in an OS. 10
  
  4. (a) Consider the following process 10
- | Process        | Arrival time | Service Time |
|----------------|--------------|--------------|
| P <sub>1</sub> | 0            | 8            |
| P <sub>2</sub> | 1            | 4            |
| P <sub>3</sub> | 2            | 9            |
| P <sub>4</sub> | 3            | 5            |
- Solve the above given problem with shortest remaining time first by drawing gantt chart and also calculate the average waiting time, turnaround time and throughput.
- (b) Explain RAID with different levels. 10
  
  5. (a) Explain the working of EDF and RMA real time scheduling algorithms. 10  
 (b) What is semaphore? Give an implementation of bounded buffer producer consumer problem using semaphore. 10
  
  6. (a) Define the meaning of a race condition? Use an Execution Sequence to illustrate your answer. 10  
 (b) Explain different file allocation techniques in an OS. 10

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