

(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.

- Q. 1** (a) Define an operating system? What are the different functions of an OS? (5)  
**Define OS carries one mark. Four different function, each function with explanation carries one mark**
- (b) What is a Process? What are the contents of a Process Control Block? (5)  
**What is PCB 01 mark, 4 fields with explanation each carry one mark.**
- (c) What are the different features of a Real Time OS? (5)  
**Any five features each carries one mark.**
- (d) Explain Segmentation as a Memory Management scheme. (5)  
**Segmentation explanation 04 mark, Diagram 01 mark**
- Q. 2** (a) What is Preemptive and Non-Preemptive CPU scheduling? Explain any one CPU scheduling algorithm in detail. (10)  
**Preemptive scheduling 02 marks, Non preemptive scheduling 02 marks  
Any one scheduling algorithm 06 marks**
- (b) Explain concept of I-nodes in Unix operating system. (10)  
**I-node structure diagram -02 marks  
Explanation of I-node Structure -08 marks**
- Q. 3** (a) What is a Deadlock? What are the four conditions for a deadlock to occur? (10)  
**What is Deadlock-02 marks. Four Conditions each carries 2 marks**
- (b) Explain RAID architecture to manage devices in an OS (10)  
**At least five levels of RAID  
Explanation of each level 01 mark  
Diagram for each level 01 mark**
- Q. 4** (a) Explain clearly Demand Paging and concept of Virtual memory in an OS. (10)  
**Demand Paging -05 Marks  
Virtual memory -05 Marks**
- (b) What are the different issues to be considered in scheduling in a real time OS. (10)  
**Five valid issues with explanation each carries two marks**
- Q. 5** (a) Explain contiguous and non-contiguous file allocation techniques in an OS. (10)  
**Each file allocation technique explanation and diagram -05mark**
- (b) What is the kernel of an OS? Describe Monolithic kernel and microkernel architecture of an OS. (10)  
**What is kernel of an OS -02 marks, Monolithic kernel explanation with diagram 04 marks  
Microkernel explanation with diagram 04 marks**
- Q. 6** (a) Compare and contrast Unix and Windows operating system. (10)  
**Each valid difference carries 2 marks.**
- (b) Write a note on Device management in an OS (10)  
**At least five valid points with explanation. Each point carries 2 marks**