

[Time: 3 Hours]

[Total Marks: 80]

- Note: (1) Question 1 is compulsory
(2) Solve any three questions out of remaining
(3) Assume suitable data wherever necessary

- Q.1. (a) Mention different types of Operating systems and list their salient features. (5M)
(b) With the help of examples explain Test and Set condition in Microprocessor systems. (5M)
(c) What is a superblock? Elaborate on its structure and role in Operating system. (5M)
(d) What are the characteristics of Real time Operating Systems? (5M)
- Q.2. (a) With the help of a neat diagram discuss process states and state transitions with respect to Unix O.S. (10M)
(b) Bring out the design issues of Multiprocessor Operating systems. (10M)
- Q.3. (a) Give the structure of a buffer header. Discuss any scenario that the kernel may follow to allocate a buffer for a disk block.. (10M)
(b) What is the relevance of an inode in Unix? What are direct and indirect blocks in an inode? (10M)
- Q.4. (a) Explain in brief Gang based scheduling and affinity based scheduling algorithms for multiprocessor systems. (10M)
(b) Discuss in detail transparency issues of distributed operating systems. (10M)
- Q.5. (a) Consider 3 periodic processes scheduled on a preemptive uniprocessor. The execution times and periods are as shown in the following table:

Process	Execution Time	Period
1	1	8
2	2	5
3	4	10

The units of time may be considered to be schedulable time slices. The deadlines are that each periodic process must complete within its period. Depict the scheduling of the processes with the help of a timing diagram. Calculate the Utilization and state whether the system is schedulable with EDF. (10M)

- (b) Compare and contrast i) EDF and RMA scheduling ii) Test and Set and Compare-and-Swap instructions. (10M)

- Q.6. Write short notes on: (any two) (20M)
i. Architecture of Unix OS
ii. Android OS
iii. Cloud OS.
