[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.

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