Time: 3 Hrs   **Marks: 80**

Note: 1. Question No. 1 is compulsory
       2. Attempt any Three Questions Out of remaining five questions.

Q.1 a. Mention different types of Operating system and list their silent features.   5
   b. What is a superblock? Elaborate on its structure and role in operating system.   5
   c. Explain middleware and its role in distributed system.   5
   d. What are the characteristics of real time operating system?   5

Q.2 a. What is buffer cache? Explain Buffer allocation and buffer releasing algorithm in
     detail.   10

   b. With the help of neat diagram discuss the process states and state transitions with
     respect to Unix OS   10

Q.3 a. Explain Test and Set Instruction and swap instruction.   10

   b. Explain Android OS architecture in detail.   10

Q.4 a. Explain Kernel Data Structures for processes.   10

   b. Explain algorithm for Reading a Disk Block, and algorithm for writing a Disk Block.
        10

Q.5 a. Based on the vicinity and accessibility of the main memory to the processors, explain
     UMA, NUMA and NORMA.   10

   b. Discuss various issues of cloud OS.   10

Q.6 a. Explain transparency design issues in distributed computing.   10

   b. What is an Operating System? Explain various design approaches of Operating
     System.   10

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