

N.B. : 1) Question No.1 is **compulsory**.

2) Attempt any **four** from the remaining **six** questions.

1. (a) Define Multiplexer. Also design 8:1 Multiplexer (10)
(b) Simplify the Boolean function using K-map (10)
 $F(A,B,C,D) = \sum(0,2,5,7,8,10,13,15)$
 - i) Express F in the minimum sum of products form
 - ii) Express F in minimum product of sums form
 - iii) Also draw the circuit diagram of the simplified equations using minimum number of gates
2. (a) What is RAID? Explain any four RAID levels. (07)
(b) List and briefly explain various ways in which an instruction pipeline can deal with branch instructions. (08)
3. (a) Define Cache memory. Explain Cache memory mapping in detail. (07)
(b) Illustrate SMP organization in detail. (08)
4. (a) With a circuit diagram explain a 4-bit synchronous counter. (07)
(b) List & explain different superscalar Instruction issue policies. (08)
5. (a) Discuss the concept of Cloud Computing. (07)
(b) What is the relationship between instructions and micro-operations? Briefly explain what is meant by a hardwired implementation of a control unit. (08)
6. (a) Describe different bus arbitration methods in detail. (07)
(b) Explain different addressing modes along with the address calculation formula and advantages and disadvantages of the same with example. (08)
7. Write Short Notes on **any three**:- (15)
 - a) NORMA
 - b) Instruction Cycle
 - c) Combinational circuits Vs Sequential circuits
 - d) Associative Memory