



**ENGINEERING & MANAGEMENT EXAMINATIONS, DECEMBER - 2008**  
**DIGITAL ELECTRONICS**  
**SEMESTER - 1**

Time : 3 Hours ]

[ Full Marks : 70

**GROUP - A****( Multiple Choice Type Questions )**

1. Choose the correct alternatives for any ten of the following :

10 × 1 = 10

i)  $(1100 \cdot 1011)_2 = (?)_{10}$

a) 10·6785

b) 11·6578

c) 12·6875

d) 13·6785.

ii) 2's complement of 10101100 is

a) 11001010

b) 01010011

c) 01010100

d) 01011001.

iii)  $(247 \cdot 36)_8 = (?)_{16}$

a) A7·78

b) 1A7·36

c) B7·87

d) 1B7·36.

iv) MBR, in reference to memory management is

a) Memory Broad Register

b) Memory Buffer Relay

c) Memory Buffer Register

d) None of these.

v) Output of NAND gate is 1, if and only if

a) all inputs are 1

b) any input is 1

c) all inputs are 0

d) any input is 0.



**GROUP - B****( Short Answer Type Questions )**Answer any *three* of the following.

3 × 5 = 15

2. Apply K-map to obtain the minimal form for the function :

$$F(A, B, C, D) = \Sigma(0, 4, 5, 7, 8, 9, 13, 15)$$

$$d(A, B, C, D) = \Sigma(1, 2, 6, 10)$$

3. Draw a half-adder circuit and describe its operations.
4. Design a 4-bit up-down counter.
5. Prove the following logical equation using Boolean algebra :

$$(A+BC) \cdot (B+A\bar{C}) = BC + A\bar{C}$$

6. i) Subtract  $(7489)_{10} - (2485)_{10}$  using 10's complement method.
- ii) What is a Multiplexer ? Why is it called "Data selector" ?

**GROUP - C****( Long Answer Type Questions )**Answer any *three* of the following questions.

3 × 15 = 45

7. a) Represent the decimal number "27" in
- BCD code
  - Octal code
  - Gray code.
- b) Draw the block diagram of a digital multiplexer and explain its function.
- c) Give the functional truth table of a 4 : 1 multiplexer and realize it using basic gates AND, OR and NOT.
- d) Implement the expression using a multiplexer :

$$f(A, B, C, D) = \Sigma m(0, 2, 3, 6, 8, 9, 12, 14)$$

3 + 4 + 4 + 4

