

B.sc (IT) sem I  
Introduction to Digital  
Electronics  
(3 Hours)

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

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

(3) **All** questions carry **equal** marks.

1. (a) Write the binary digits used to record the word BASE in BCD. 5
- (b) Find the decimal equivalent of the binary number 110.101 5
- (c) Find the decimal equivalent of the octal number 127.54. 5
- (d) Find the decimal equivalent of the hexadecimal number 2B. C4. 5
  
2. (a) Define the term 'byte'. What is the difference between a bit and a byte ? 5
- (b) Write 4 bit BCD code for the following numbers : 5
  - (a)  $25_{10}$       (b)  $128_{10}$
- (c) Write short notes on : 5
  - (a) Gray Code      (b) Excess-3 Code.
- (d) Convert  $11010011_2$  to base 10. 5
  
3. (a) Subtract  $56_{10}$  from  $92_{10}$  using complementary method. 4
- (b) Subtract  $0111000_2$  from  $1011100_2$ . 4
- (c) Multiply binary numbers 1010 and 1001. 4
- (d) Divide  $100001_2$  by  $110_2$ . 4
- (e) Explain how multiplication and division operations are performed in a computer by using additive approach ? 4
  
4. (a) Construct a logic circuit for the boolean expression (i)  $A \cdot B + C$  (ii)  $\overline{A \cdot B} + C \cdot D + \overline{E \cdot F}$  10
- (b) Construct a logic circuit for the boolean expression  $A \cdot \overline{B} + C \cdot (A + B \cdot D)$  using NAND gates only. 10
  
5. Write short notes on : Explain with diagram. 20
  - (i) Half adder
  - (ii) Full adder
  - (iii) Multiplexer.
  
6. (a) What is the difference between S-R flip-flop and J-K-flip-flop. Explain through diagram. 10
- (b) Apply De-morgan's theorem in this function and find the complement. 10

$$F_1 = \overline{x} \cdot y \cdot \overline{z} + \overline{x} \cdot \overline{y} \cdot z$$