Exam. Code : 107202
Subject Code : 2102

Bachelor of Computer Application (BCA) 2nd Semester
PRINCIPLES OF DIGITAL ELECTRONICS
Paper—II

Time Allowed—Three Hours]   [Maximum Marks—75

Note :— Attempt **FIVE** questions in all.

1. (a) Perform the following additions using 2s complement :

   (i) −20 to +26

   (ii) 25 to −15   7.5

   (b) Using 2's complement notation perform the following arithmetic operations using 8 bit register(s) :

   (i)   25 + (−12)

   (ii) 17 − 6

   (iii) −18 − 16

   (iv) −8 + (18)

   (v)   12 − (−19)   7.5

2. (i) Convert the decimal number 430 to Excess-3 code.
                                                          7.5

   (ii) Convert the binary number 10110 to Gray code.
                                                          7.5

3. (a) Simplify y = (A + B) (A + B') (A' + B') by using laws and theorems of Boolean Algebra. 7.5

(b) Explain the various laws of Boolean algebra. 7.5

4. Solve the following using K-map :

$F(A, B, C, D) = \Sigma(0, 2, 3, 6, 7, 12, 13, 14) +$

$$\Sigma d(1, 4, 11, 15)$$

Here d denotes the don't care condition. 15

5. (a) Describe the need of a multiplexer in a system. How is a multiplexer different from a decoder ? Draw the logic diagram of 8 × 1 multiplexer and 2 × 4 decoder. 7.5

(b) Explain the working of a S-R flip-flop using its logic diagram and truth-table. 7.5

6. (a) Explain the working of a full subtractor in detail. 7.5

(b) Write the truth table of J-K flip-flop and explain how race-around problem can be solved in it. 7.5

7. (a) Distinguish between static and dynamic devices. 7.5

(b) Explain the RAM memory read operation. 7.5

8. (a) Explain the EPROM address selection Logic. 7.5

(b) What is a counter ? Explain the working of a counter with the help of the truth table and timing diagram. 7.5

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