RAMAKRISHNA MISSION VIDYAMANDIRA

(Residential Autonomous College affiliated to University of Calcutta)

FIRST YEAR [2019-22]

B.A./B.Sc. FIRST SEMESTER (July – December) 2019

Mid-Semester Examination, September 2019

Date : 18/09/2019 **COMPUTER SCIENCE (General)**

Time : 11 am – 12 noon **Paper: I** Full Marks : 25

[Use a separate Answer Book for each group]

GROUP – A

Answer **any one** from question nos. **1 & 2** : (1 × 2.5)

1. Reduce the following expression using K-map:

   $F = \Pi(2,8,9,10,11,12,14)$ [2.5]

2. Differentiate between the following terms:

   a) Primary memory and Secondary memory. [1.5]

   b) Von Neumann Architecture and Harvard Architecture. [1]

Answer **any two** from question nos. **3 to 5** : (2 × 5)

3. a) Encode data bits 1101 into 7-bits even parity hamming code. [3]

   b) Subtract $(111.111)_2$ from $(1010.01)_2$ [2]

4. a) Using only NAND gate, implement OR gate. [2.5]

   b) Convert $(108.32)_{10}$ to binary. [2.5]

5. a) Why Gray code is a reflective code? [2]

   b) Perform the BCD subtraction : 109.8-92.5 [3]

GROUP – B

Answer **any one** from question nos. **6 and 7** : (1 × 2.5)

6. Explain combination logic circuit. [2.5]

7. Why is Decoder known as 'Minterm Generator'? [2.5]

Answer **any two** from question nos. **8 to 10** : (2 × 5)

8. a) While designing Adder, only three inputs are taken into consideration at most. Explain why. [3]

   b) What kind of Adder will you use to add two binary numbers of 4-bits each. [2]

9. a) Implement the following expression using Multiplexer:

   $F(A,B,C,D) = \sum(1,2,4,7,6,8,10,15)$ [3]

   b) What do you mean by Code Converter? [2]

10. Design a 4-bits Magnitude Comparator. [5]

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