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 : 16/09/19

Time : 11 am – 12 noon

COMPUTER SCIENCE (Honours)

Paper : I (CC1)

Full Marks : 25

Answer **any one** question of the following: [1 × 5 = 5]

1. a) Comment on the validity of the conclusion $R \wedge (P \vee Q)$ from the premises $P \vee Q$, $Q \rightarrow R$, $P \rightarrow M$ and $\sim M$. [2.5]

   b) Show that dual of Ex-NOR is equal to its complement. [2.5]

2. a) Explain static storage class with an example. [2.5]

   b) Perform the subtraction with the following decimal numbers using 9's complement. [2.5]

   20- 1000.

Answer **any two** questions of the following: [2 × 10 = 20]

3. a) Draw a flowchart to find the largest among three different integers entered by user. [5]

   b) Express the following function in sum of minterms an product of maxterm

   $F(A,B,C,D) = (A+\overline{B}+C) (A+\overline{B}) (A+\overline{C}+\overline{D}) (\overline{A}+B+C+\overline{D}) (B+\overline{C}+\overline{D})$ [5]

4. a) Simplify the following using laws of propositional logic.

   $[(p \vee q) \wedge \sim(\sim p \wedge (\sim q \vee \sim r))] \vee (\sim p \wedge \sim q) \vee (\sim p \wedge \sim r)$ [5]

   b) Obtain the simplified expression in POS form for the following Boolean function.

   $F(A,B,C,D) = \prod (0,1,2,3,4,10,11)$ [2.5]

   c) Convert the following function to other canonical form

   $F(A,B,C,D) = \Sigma (0,2,6,11,13,14)$ [2.5]

5. a) Explain typecasting with an example. [2.5]

   b) Differentiate between precedence and associativity. [2.5]

   c) Find the 2's complement of $(10110.01)_2$ [2]

   d) Implement $F = A\overline{C} + ACE + AC\overline{E} + \overline{A}C\overline{D} + \overline{A}\overline{D}\overline{E}$ using AND and NOT gates. [3]

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