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MCA 1st Semester Examination

Digital Organization (O.S.)

MCA-102

Time : 3 Hours **Max. Marks : 60**

The candidates shall limit their answers precisely within the answer-book (40 pages) issued to them and no supplementary/continuation sheet will be issued.

Note : Attempt five questions in all, selecting one question from each section. Question 9 is compulsory.

SECTION - A

1. (a) What are the alpha numeric codes? Explain.

   (b) $(AA1)_{16}$ to $(----------)_{10}$, $(----------)_{8}$

   (c) $(63718)_{10}$ to $(----------)_{2}$, $(----------)_{8}$, $(----------)_{16}$

   (d) $(0.62652)_{10}$ to $(----------)_{2}$, $(----------)_{8}$ **(12)**

2. (a) 278+978 using BCD addition.

   (b) 110101 - 110111 using 1's complement.

   (c) 52.79 - 78.58 using 9's complement.

   (d) $(57)_{8}$ + $(65)_{8}$ using octal addition. **(12)**

SECTION - B

3. (a) Explain the working of BJT as a switch. Give Details of saturated & non-saturated logic. **(12)**

4. Draw & Explain the characteristics of ECL & CMOS. **(12)**

SECTION - C

5. Design all the basic gates using universal gates. Give four laws of Boolean algebra. **(12)**

6. Minimize the following using k-map & give your result in both SOP & POS forms.

   $F(w, x, y, z) = \Sigma(1, 4, 6, 7, 8, 9, 10, 11, 15)$ **(12)**

SECTION - D

7. Explain the working of BCD adder with neat & clean diagram. **(12)**

8. Design the JK flip flop using T-flip flop. Give applications of T-flipflop. **(12)**

SECTION - E

9. Write Technical note on the following:

   (a) Successive approximation method.

   (b) Encoders.

   (c) Depletion region in P-N Junction diode. **(3×4=12)**