Total No. of Questions : 5]

SEAT No. :

P1386

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F.Y. B.Sc. (Computer Science)

ELECTRONIC SCIENCE

ELC - 112 : Principles of Digital Electronics

(Semester - I) (New Pattern) (CBCS - 2019)

Time : 2 Hours] *[Max. Marks : 35*

Instructions to the candidates:

1) ***Q.1 is compulsory.***
2) ***Solve any three questions from Q.2 to Q.5.***
3) ***Questions 2 to 5 carry equal marks.***

Q1) Solve any five of the following : **[5 × 1 = 5]**

a) $(1)_2 + (1)_2 + (1)_2 = (?)_2$.

b)  This gate is

i) NAND.

ii) NOR.

iii) NOT.

c) For a demultiplexer with 24 outputs the number of control inputs are _____.

d) Find 1's complement of $(25)_{10}$.

e) Define noise immunity.

f) "Multiplexer circuit can be built by using OR - OR combinations of logic gates". State whether this statement is true or false.

Q2) a) i) Perform $(100)_{10} - (33)_{10}$ using 2's complement method. **[3]**

ii) Solve following equation using Boolean Algebra $Y = \overline{A}(B+C) + \overline{C} + AB$. **[3]**

b) Draw symbol and truth table of NAND and EX-OR Gate. **[4]**

P.T.O.

Q3) a) i) Convert the following expression into standard SOP form. **[3]**

$$Y = AB + \overline{B}C + \overline{C}$$

ii) Explain working of 3 × 4 matrix keyboard encoder. **[3]**

b) Draw and explain working of 1 : 4 demultiplexer. **[4]**

Q4) a) i) Simplify the following expression using K map **[3]**

$$Y = \overline{P}\overline{Q}R + \overline{P}\overline{Q}\overline{R} + PQ\overline{R} + \overline{P}Q\overline{R} + \overline{P}QR$$

ii) Draw logic circuit diagram for BCD to 7 segment converter. Give the logic levels to display digit '9' on common anode display. **[3]**

b) Perform the following **[4]**

i) $(11011)_{gray} = (?)_2$

ii) $(A5{\cdot}D)_{16} = (?)_{10}$

Q5) Attempt any four of the following : **[10]**

a) Write a short note on BCD code.

b) State and prove De-Morgan's theorem.

c) Explain use of EX OR gate as parity generator.

d) Write the truth table for 3 bit binary to gray conversion.

e) Define following :

i) Fan in

ii) Fan out.

f) Explain working of half Adder.

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