Total No. of Questions : 5]

SEAT No. :

P5126

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

ELECTRONICS SCIENCE

ELC 112 : Principles of Digital Electronics

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

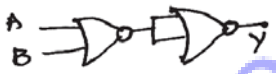
Time : 2 Hours] *[Max. Marks : 35*

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) OR (ii) NOR (iii) AND

c) For a multiplexer with 60 inputs, find out the number of control lines.

d) Full form of ASCII is _____.

e) $\overline{A} + \overline{B}$ =_____.

f) State the function of IC 7447.

Q2) a) i) Give rules for binary addition of two bits. Perform $(1100.010)_2$ + $(10.1110) + (1010)_2$ **[3]**

ii) Using rules of Boolean algebra simplify **[3]**

$$M = \overline{X}\overline{Y}\overline{Z} + \overline{X}Y\overline{Z} + X\overline{Y}Z + XY\overline{Z}$$

b) With neat logic diagram explain the working of 4 bit universal adder subtractor. **[4]**

P.T.O.

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

$Y=(\overline{A}+\overline{B})\,(\overline{B}+C)\,(\overline{A}+C)$

ii) Draw the logic diagram for 3 bit adder and write its truth table. **[3]**

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

i) $(1011101)_2$ = (?) Gray

ii) $(110101)_2$ = (?) BCD

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

$A = \overline{X}\overline{Y}Z + \overline{X}\overline{Y}\overline{Z} + XY\overline{Z} + \overline{X}Y\overline{Z} + \overline{X}YZ$

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

b) Draw the logic diagram for the given Boolean expression and write the truth table for it **[4]**

$$Y = \overline{\overline{A}BC\overline{D} + (A+\overline{C}) + BD}$$

Q5) Attempt any Four of the following : **[4 × 2½ = 10]**

a) Write a short note on Hexadecimal number system.

b) Write a short note on universal gates.

c) Write a short note on IC 74138.

d) What is a Gray code? Where is it used?

e) Explain how EX-OR gates can be used as controlled inverter.

f) Explain the concept of parity bits. Where are parity bits used?

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