

Total No. of Questions : 5]

SEAT No. :

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[5902]-16

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

ELECTRONICS SCIENCE

ELC-112 : Principles of Digital Electronics

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

Time : 2 Hours]

[Max. Marks : 35

Instructions to the candidates:

- 1) Question 1 is Compulsory.
- 2) Solve any three questions from Q.2 to Q.5.
- 3) Figures to the right indicate full marks.
- 4) Draw neat diagrams wherever necessary.

Q1) Solve any five of the following

[5×1=5]

- a) Define propagation delay.
- b) Draw symbol and Truth Table of AND logic
- c) Convert $(23)_{10} = (?)_{BCD}$
- d) What is the base of Decimal number system.
- e) How many select lines are required to design 1 : 8 Demultiplexer.
- f) What is Non-weighted code?

Q2) a) Any Two of the following.

[2×3=6]

- i) State and prove De-morgan's Theorem.
- ii) Convert $(45)_{10} - (25)_{10} = (?)_2$ using 2's complement
- iii) Convert given SOP equation to standard SOP

$$\bar{A}\bar{B} + B\bar{C} + \bar{A}C$$

b) Draw and explain 4-bit universal Adder/Subtractor.

[1×4=4]

P.T.O.

Q3) a) Attempt any two of the following. **[2×3=6]**

- i) Draw and explain one bit digital comparator.
- ii) Simplify following expression using laws of boolean algebra.

$$Y = \bar{A}\bar{B}\bar{C} + \bar{A}B\bar{C} + A\bar{B}\bar{C} + ABC$$

- iii) Subtract $(10110)_2$ from $(63)_{10}$ and write down result in binary.

b) Draw and explain the logic diagram of 1 : 4 Demultiplexer. **[1×4=4]**

Q4) a) Attempt any two of the following. **[2×3=6]**

- i) Simplify the following logical expression using k-map.

$$Y = \bar{A}\bar{B}C + \bar{A}\bar{B}\bar{C} + A\bar{B}\bar{C} + \bar{A}B\bar{C} + \bar{A}BC$$

- ii) Explain full Adder with neat logic diagram and truth table.

- iii) Convert following.

1) $(101101)_2 = (?)_{16}$

2) $(111)_{10} = (?)_2$

3) $(123)_{10} = (?)_{16}$

b) Design Binary-to-Gray Converter using Karnaugh map technique.

[1×4=4]

Q5) Attempt any four of the following **[4×2.5=10]**

- a) Draw Truth table of BCD to 7-Segment Decoder and it's block diagram.
- b) Design AND, OR & NOT logic using NOR gate only.
- c) Write short note on ASCIT.
- d) Enlist any FIVE parameters of logic family
- e) Explain Ex-OR gate as controlled inverter.
- f) Write short note on weighted code.

