



JAQ-003-1271003

Seat No. _____

M. Sc. (ECI) (Sem. I) Examination

November - 2019

Fundamental of Digital Electronics : Paper - III

Faculty Code : 003

Subject Code : 1271003

Time : $2\frac{1}{2}$ Hours]

[Total Marks : 70

1 Answer the following : (any 7 out of 10) **14**

- (1) Classify the types of Logic family (Digital IC).
- (2) Write and explain with circuit the expression of De Morgan's theorem for Boolean expression.
- (3) Convert $(95.24)_{10}$ into Binary number system.
- (4) Convert $(5732.77)_8$ into Hexadecimal number system.
- (5) Explain Commutative law for Boolean expression.
- (6) Convert $(1683.45)_{10}$ into BCD.
- (7) Explain 2 input Ex-NOR gate with its symbol and truth table.
- (8) Convert $(1100101.110)_2$ into decimal.
- (9) Explain with example an associative Law for Boolean expression.
- (10) Convert $(234.45)_{10}$ into Hexadecimal number system.

2 Answer the following : (any 2 out of 3) **14**

- (1) Design 2 input EX -OR gate using only 2 input NAND gates. Explain each output in detail.
- (2) Convert DECIMAL number (847) into ALL number systems.
- (3) Simplify following Boolean expression using K - MAP.

$$F(A, B, C, D) = \sum(0, 3, 4, 7, 8, 11, 12, 15)$$

- 3 Answer the following : 14
- (1) Explain ALL BASIC gates with proper symbol, Boolean expression and truth table.
 - (2) Explain NOR Gate as a Universal Gate.

OR

- 3 Answer the following : 14
- (1) Multiply $(10011)_2$ and $(110)_2$ using repeated Addition algorithm.
 - (2) Divide $(10111)_2$ by $(11)_2$ using repeated subtraction algorithm.

- 4 Answer the following : 14
- (1) Explain Binary FULL SUBTRACTION circuit with truth table, Boolean expression and Logic circuit.
 - (2) Design 1 Bit *BCD* Adder circuit with proper Logic circuit. (use IC 7483)

- 5 Answer the following : (any 2 out of 4) 14
- (1) Do the following arithmetic using 2's complement.
 - (a) $(+38)_{10} -- (+19)_{10}$
 - (b) $(-- 36)_{10} + (+16)_{10}$
 - (c) $(+ 40)_{10} + (-- 25)_{10}$
 - (2) Do following BCD Addition using Excess - 3 Code
 - (a) $(235)_{10} -- (133)_{10}$
 - (b) $(204)_{10} + (172)_{10}$
 - (c) $(253)_{10} + (108)_{10}$
 - (3) Write the Following forms for the given Boolean expression.

$$F(A, B, C) = \bar{B}\bar{C} + \bar{C} + AB$$
 - (a) Expanded form
 - (b) Canonical form
 - (c) Dual form
 - (4) Design 2 bit Magnitude Comparator circuit. Explain in detail.