Roll no._____ **ID: 180945/170945**

Semester: 4th

Branch: Electrical

Subject Name: Digital Electronics

Time Allowed : 3 Hrs. **MM:100**

Section –A

Note: Multiple Choice questions. All questions are compulsory. **10x1=10**

Q.1 How many nibbles are there in 10011110 number
a. 3 b. 4
c. 2 d. 8

Q.2 According to commutative law of addition
a. ABC = (AB) C b. B=B+B
c. A+B = B+A d. None of these

Q.3 On a K-map, grouping of 1's produces
a. SOP expression b. POS expression
c. AND-OR logic d. None of these

Q.4 Which logic circuit has a memory
a. Combinational Logic Circuit b. Sequential Logic Circuit
c. Both d. None

Q.5 For D = 0 flip flop responds to
a. Set b. Reset
c. No Change d. Toggle

Q.6 A Decimal to BCD Encoder is also known as:
a. 4-line-to-10-line encoder b. 4-line-to-16-line encoder
c. 10-line-to-4-line encoder d. 16-line-to-4-line encoder

Q.7 A 8 : 1 MUX has ……. Select lines
a. 8 b. 3
c. 2 d. 4

Q.8 The inverter is……..
a. NAND b. OR
c. AND d. NOT

Q.9 Which gate is known as universal gate?
a. AND b. NAND
c. XOR d. XNOR

Q.10 The radix of an Octal Number System is…….
a. 8 b. 7
c. 6 d. 9

Section-B

Note: Objective type questions. All questions are compulsory. **10x1=10**

Q.11 Define term K-MAP.
Q.12 What is Logic Gate?
Q.13 Write any two applications of A/D converters.
Q.14 Name different types of Shift Registers.
Q.15 Define Min term.
Q16. Prove that A + A.B = A
Q.17 Draw the symbol of EX-OR gate
Q.18 What is Counter?
Q.19 Define Analog Signal.
Q.20 Write full form of ASCII and EBCDIC.

Section –C

Note: Short answer type Questions. Attempt any twelve questions out of fifteen questions. **12x5=60**

Q.21 What do you mean by Digital Signal? Explain advantages and application of Digital signal.

Q.22 Multiply the following Binary Numbers:
(i) 110110 x 0110 (ii) 10101 x 101

Q.23 What is Error Correcting Coded? How it can be corrected by using parity?

Q.24 Do the subtraction by using 2's complement method of subtraction:
(i) 1001 - 1110 (ii) 11011 - 01101

Q.25 Explain Block diagram, Logical expression, Truth Table of Decimal to BCD Encoder.

Q.26 Design Block diagram, Truth Table, Logical Expression of 8 : 1 MUX.

Q.27 Differentiate between Synchronous Counter and Asynchronous Counter

Q.28 Draw the symbol, logical expression, truth table and pulse operation of EX-NOR gate.

Q.29 Solve the following Boolean expression:
(i) $ABC + AB\bar{C}D + AB\bar{C} + A\bar{B}D + A\bar{D}$
(ii) XY + X(Y+Z) + Y(Y+Z)

Q.30 State and explain Demorgen's Theorems.

Q.31 Why NAND and NOR gates are known as universal gates?.

Q.32 Explain the working of PIPO shift register with the help of pulse diagram.

Q.33 Discuss truth table, logic diagram and logical expression of a Full Adder.

Q.34 What do you mean by DEMUX? Design a 1 : 8 DEMUX by using truth table, logical expression and logical circuit.

Q35 What is the difference between Latch and Flip-Flop?

Section-D

Note: Long answer questions. Attempt any two questions out of three questions.

2x10=20

Q.36 Minimize the following Boolean expression using K-Map and realize the logic Circuit using NAND gates only.
$F(A,B,C,D) = \sum M(1,3,5,7,9,15) + d(4,6,12,13)$

Q.37 Explain the Logic Diagram, Truth Table and Operation of a J-K flip flop with neat Diagram.

Q.38 Write short note on following:
a. Binary Weighted Digital to Analog Converter
b. Ring Counter