4th Sem / Branch : Electrical Engg
Subject:- Digital Electronics

Time : 3Hrs.   M.M. : 100

SECTION-A

Note: Multiple choice questions. All questions are compulsory   (10x1=10)

Q.1 $(13)_{10}=(.........)_2$
a)   1101   b)   1110
c)   1100   d)   1111

Q.2   According to associative law of multiplication
a)   A(BC)=(AB)C   b)   C=CC
c)   A+B=B+A   d)   None of these

Q.3   On a K-map, grouping of 0's produces
a)   SOP expression   b)   POS expression
c)   AND-OR logic   d)   None of these

Q.4   ....Flip Flop does not have Race Around Condition
a)   Master Slave   b)   J-K Flip Flop
c)   RS Flip-Flop   d)   D Flip-Flop

Q.5   When the applied input to a NOT gate is high, the output is
a)   High or 1   b)   Low or 0
c)   High or 0   d)   Low or 1

Q.6   Distinct digits used in Decimal Number system are
a)   0 to 7   b)   0 to 8
c)   0 to 9   d)   0 to 10

Q.7   A D-multiplexer can be used as
a)   Encoder   b)   Decoder
c)   LCD Device   d)   None of these

Q.8   The most suitable gate used in the comparator circuit is
a)   AND   b)   OR
c)   XOR   d)   NOT

Q.9   How many bytes are there in the Binary Number 1110000111001100
a)   3   b)   2
c)   4   d)   8

Q.10 A 1 :32 Demux has..............output data lines
a)   32   b)   1
c)   16   d)   None of these

SECTION-B

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

Q.11 Define term Latch

Q.12 What is Universal Shift Register?

Q.13 Write any two names of D/A convertor.

Q.14 Name different types of Sequential Circuits.

Q.15 Define Monotonicity

Q.16 $(101110110)_2=(......................)_8$

Q.17 Draw the symbol of EX-NOR gate

Q.18 What is Hexadecimal Number System?

Q.19 Define Analog to Digital Convertor

Q.20 Write any two application of Counter.

SECTION-C

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

Q.21 What do you mean by Number System? How many number system are used in Digital electronics? Explain in detail.

Q.22 Add the following Binary Numbers:
1) 1101010+0110110   2) 101011+110010

Q.23 What is Logic Gate? Draw the symbol, Truth Table, Logical Expression of different types of logic gates.

Q.24 Do the subtraction by using 2's complement method of subtraction.
1) 1101-1001   2) 10011-11001

Q.25 Explain Block diagram, Logical expression Truth Table of Octal to Binary Encoder.

Q.26 Design Block diagram, Truth Table, Logical expression of BCD to 7 segment Decoder

Q.27 Differentiate between MUX and DEMUX

Q.28 Draw the symbol, logical expression, truth table and pulse operation of EX-OR gate

Q.29 Solve the following Boolean expression
1) $ABCD+ABC\overline{D}+AB\overline{C}+A\overline{B}$
2) $XYZ[XY+\overline{Z}(YZ+XZ)]$

Q.30 State and explain Demorgen's Theorems.

Q.31 Describe Ring Counter in detail with Truth Table and Logical circuit.

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

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

Q.34 What is DEMUX? Design a 1:8 DEMUX by using truth table logical expression and logical circuit.

Q.35 What is the difference between Digital Signal and Analog Signal?

SECTION-D

Note: Long answer type 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.
$F(A,B,C,D)=\Sigma M(0,1,2,5,7,13,14)+d(3,6,9)$

Q.37 Explain the Logic Diagram, Truth Table and Operation of Master-Slave J-K flip Flop and show how it will overcome Race Around Condition of the flip-flop

Q.38 Write short note on following:
a. R/2R Ladder Digital to Analog Convertor
b. Dual Slop Analog to Digital Convertor