Q.32 Discuss truth table, logic diagram and logical expression of a Full Subtractor.

Q.33 Explain the working of SIPO shift register with the help of pulse diagram.

Q.34 What do you mean by DEMUX? Design a 1:4 DEMUX by using truth table, logical expression and logical circuit.

Q.35 What is Error Correcting Coded? How it can be corrected by using parity?

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

$Y = \Sigma M (0,1,3,5,7,9,11,13,15)$

Q.37 Explain the following A to D Convertor with suitable diagram.
   a) Successive Approximation A/D Convertor
   b) Stair Step ramp A/D Convertor
   c) Dual Slop A/D Convertor

Q.38 Write short note on following:
   a) Decade Counter
   b) Universal Shift Register

4th Sem / Mechatronics
Subject:- Digital Electronics

Time : 3Hrs.   M.M. : 100

SECTION-A

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

Q.1 How many nibbles are there in 1110010101001100 binary number
   a) 3   b) 2
   c) 4   d) 8

Q.2 Which expression shows a POS expression
   a) A(B+C)+D   b) (A+B+C)(C+D)
   c) AB+CD+BC   d) None of these

Q.3 How many cells are there in a 4 variable K-map?
   a) 4 cells   b) 15 cells
   c) 8 cells   d) 16 cells

Q.4 A MUX means
   a) many into one device
   b) one into many device
   c) many into many device
   d) None of these

Q.5 _____ flip-flop does not have race around condition.
   a) Master Slave   b) D flip-flop
   c) RS flip-flop   d) J-K flip flop

Q.6 Which device has more operating speed?
   a) LED   b) LCD
   c) Fluorescent tube   d) None

Q.7 A Demux performs the reverse operation of
   a) Decoder   b) Encoder
   c) MUX   d) Adder

Q.8 In a Boolean algebra A.1 = _____
   a) 0   b) A
   c) 1   d) None

Q.9 The NOT gate performs a function known as
   a) Complementation   b) Inversion
   c) Assertion   d) Both (a) and (b)

Q.10 The radix of a Decimal Number System is_____
   a) 8   b) 10
   c) 16   d) 9

SECTION-B

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

Q.11 Define Minterm.

Q.12 What is Digital Signal?

Q.13 Write full form of ASCII and EBCDIC.

Q.14 Name different types of Counters.

Q.15 Write any two applications of A/D converters.

Q.16 What is Resolution?

Q.17 Draw the symbol of EX-NOR gate

Q.18 What is Decoder?

Q.19 List any two applications of Multiplexer.

Q.20 What is Latch?

SECTION-C

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

Q.21 What is the difference between Latch and Flip-Flop?

Q.22 Divide the following Binary Numbers:
   i) 11011 by 101
   ii) 111100 by 100

Q.23 What is Digital Signal? Explain advantages and application of Digital signal over Analog signal.

Q.24 Convert the following Hexadecimal Numbers into Decimal Numbers:
   i)   7FFF   ii) 9AD
   iii) A3B7

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

Q.26 Design Block diagram, Truth Table, Logical Expression of 4:1 MUX.

Q.27 Differentiate between Synchronous Counter and Asynchronous Counter

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

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

Q.30 State and Explain the Laws of Boolean Algebra.

Q.31 Explain the working of S-R Flip Flop by using truth table, logic diagram and pulse wave diagram.