Q.31 Write difference between static and dynamic memories.

Q.32 Discuss the working principle of D/A converter.

SECTION-D

Note: Long answer type questions. Attempt any three questions.   3x10=30

Q.33 Explain with block diagram the working of a 4-bit SISO shift register.

Q.34 Draw a K-Map to reduce the following function and realize the reduced function using NAND gates only

$$F = \sum m\,(0, 1, 3, 6, 11, 15) + d\,(2, 5, 13)$$

Q.35 What are logic gates? Explain all logic gates with symbol and Truth Table.

Q.36 Write short notes on any two

   (i)   JK master slave flip flop

   (ii) R-2R ladder D/A convertor

   (iii) Postulates of Boolean algebra

  (**Note:** Course outcome/CO is for office use only)

Computer Engg / IT / Eletx.

Subject : Digital Electronics / Digital Eltx-I

Time : 3 Hrs.   M.M. : 100

SECTION-A

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

Q.1 A _____ signal varies continuously with time.

Q.2 In _____ codes, each digit of the code do not have any position weight.

Q.3 There are _____ cells in a 3 variable K-Map.

Q.4 A 16:1 MUX has _____ number of select lines.

Q.5 A counter is a _____ circuit consisting of a combination of flip flops used for counting pulses (combinational/Sequential).

Q.6 Expand the terms PIPO and PISO.

Q.7 A _____ FF does not have a race around condition.

Q.8 A full adder is having _____ inputs and _____ outputs.

Q.9 For a five input OR gate there can be _____ input combination in the truth table.

Q.10 Find the 2's Complement of the binary number 01100111.

SECTION-B

Note: Very Short answer type questions. Attempt any ten questions out of twelve. 10x2=20

8x3

Q.11 Define A/D and D/A convertor.

Q.12 Define Ring counter.

Q.13 Define encoder and decoder.

Q.14 Define De-Morgan theorem.

Q.15 Convert $(101011)_2$ to Gray code.

Q.16 What are digital signals?

Q.17 Name different types of semiconductor memories.

Q.18 Convert the following binary numbers to decimal

(i) $(0100110)_2 = (\quad)_{10}$

(ii) $(10101010)_2 = (\quad)_{10}$

Q.19 Give the Truth table for NAND gate.

Q.20 Give the truth table and the logic diagram of a full adder.

Q.21 Define positive edge triggered flip flop.

Q.22 Give the logic diagram of 4 bit serial in serial out shift register using D flip flop.

SECTION-C

Note: Short answer type questions. Attempt any five questions. 5x8=40

Q.23 Perform

(i) $(16)_{10} - (5)_{10}$ using 1's Complement.

(ii) $(10)_{10} - (14)_{10}$ using 2's Complement.

Q.24 What do you mean by error detection codes? Explain about even parity.

Q.25 Why NAND and NOT gates are called universal gates?

Q.26 Simplify the expression using Boolean algebra and draw the logic circuit of the simplified expression.

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

Q.27 Write short note on four bit adder.

Q.28 Give the basic function of a MUX. Draw block diagram and Truth Table of a 8 x 1 MUX.

Q.29 Differentiate between synchronous and asynchronous counter.

Q.30 What is race abound condition and how is it removed.

3rd Sem / Comp, IT, Eltx, EI, Med Eltx, Power Eltx. Elect. 4 Eltx . Engg.

Subject : Digital Eltx/ Digital Eltx - I

Time : 3 Hrs.   M.M. : 100

SECTION-A

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

Q.1   The number of digits in octal system is   (CO2)
a)   8   b)   9
c)   2   d)   10

Q.2   The NOR gate is OR Gate followed by   (CO3)
a)   AND gate   b)   NAND gate
c)   NOT gate   d)   EXOR Gate

Q.3   The Binary number 10101 is equivalent to Decimal number.   (CO2)
a)   19   b)   12
c)   27   d)   21

Q.4   In 1 to 4 demultiplexer , how many select lines are required.   (CO7)
a)   3   b)   2
c)   4   d)   8

Q.5   How many AND gates are required to realize $y = CD + EF + G$.   (CO5)
a)   2   b)   3
c)   4   d)   1

Q.6   SR Latch consist of
a)   3 inputs   b)   4 inputs
c)   2 inputs   d)   one inputs

Q.7   A full adder circuit has outputs   (CO6)
a)   1   b)   2
c)   4   d)   3

Q.8   A Decimal counter has_____stater   (CO9)
a)   8   b)   4
c)   6   d)   10

Q.9   The basic storage element in digital systems is   (CO12)
a)   Counter   b)   Encoder
c)   Flip Flop   d)   Mux

Q.10 IC 74181 is_____bits ALU.   (CO12)
a)   8   b)   10
c)   2   d)   4

SECTION-B

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

Q.11 Excess-3 code of $(24)_{10}$ is_____   (CO3)

Q.12 Full form of TTL_____ (CO4)

Q.13 2'S complement of 10110100 is_____ (CO2)

Q.14 Full form of SIPO _____. (CO10)

Q.15 Full form of EEPROM_____. (CO12)

Q.16 State De Morgan's theorem . (CO4)

Q.17 Draw truth table of JK Flip Flop. (CO8)

Q.18 Draw truth table of half Adder. (CO6)

Q.19 Draw truth table of Ex-OR Gate. (CO4)

Q.20 Write any two applications of digital Signal. (CO1)

SECTION-C

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

Q.21 Subtract 0110 from 1001 using 2's complement method. (CO2)

Q.22 Compare TTL & CMOS. (CO4)

Q.23 Explain NOR Gate as universal Gate (CO4)

Q.24 Explain Full adder with circuit diagram. (CO6)

Q.25 Explain 4:1 mux with diagram. (CO7)

Q.26 Explain SR Flip Flop. (CO8)

Q.27 Explain Advantages of digital signal over analog signal. (CO1)

Q.28 Convert $(85)_{10} = (?)_2 = (?)_8$. (CO2)

Q.29 Explain the use of parity. (CO3)

Q.30 Subtract 1010 from 1100 using I's complement method. (CO2)

Q.31 Explain PIPO shift register. (CO10)

Q.32 Differentiate between Static RAM and dynamic RAM? (CO12)

Q.33 Draw block diagram of IC 74181 (ALU) (CO12)

Q.34 Explain application of A to D converter. (CO11)

Q.35 Differentiate between Latch and Flip Flop. (CO8)

SECTION-D

Note: Long answer type questions. Attempt any two questions out of three questions. (2x10=20)

Q.36 Explain with diagram the working of Synchronous Decade counter (CO9)

Q.37 Simplify using K-map & realize using NAND Gates only.

F(A,B,C,D) = $\sum$m (0,1,3,4,8,10,12) + d(11,13) (CO5)

Q.38 Explain with diagram the working of successive approximation type A/D converter. (Co11)