I Semester Diploma Examination, Nov./Dec. 2013

DIGITAL ELECTRONICS

Time : 3 Hours

[Max. Marks : 100]

Note:
(i) Section – I is compulsory.
(ii) Answer any two full questions from Sections – II, III & IV.

SECTION – I

1. (a) Fill in the blanks:
   
   (i) In positive logic 5V is considered as _____.
   (ii) The octal equivalent of 101110112 is _____.
   (iii) Number of flip flops used for Mod-12 counter are _____.
   (iv) In the K-map, if all the 1’s in a group are overlapped by other groups, then such group is called as _____.
   (v) In unsaturated logic family the transistor is used in _____ region.

   (b) Realize NAND gate using only NOR gates.

   5 x 1 = 5

SECTION – II

2. (a) What is ASCII code? Mention its applications.

   (b) Perform the following operations:

   (i) Convert Decimal 928 into Hexa decimal.

   (ii) Convert Hexa decimal 7AC . 39 to the Binary.

   (iii) Subtract 1101 from 1111 using 2’s complement.

   (c) Convert gray code 100110 to its Binary.

   4 + 9 + 2 = 15

ECO18

[Turn over
3. (a) State and prove Demorgan’s theorem.
(b) Write the expression for the following table using SOP & simply it using Karnaugh map.

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4. (a) Write the features of BCD & convert decimal 76 to BCD number.
(b) List the features of TTL family.
(c) Write the logic symbol, expression and truth table for the universal gates.

SECTION – III

5. (a) With gate level circuit, Truth Table explain 2 bit magnitude comparator.
(b) Explain the working of full adder with logic diagram and truth table.

6. (a) Explain with neat circuit and Truth table the working of Decimal to BCD encoder.
(b) With expression state the Boolean laws
   (i) Commutative law
   (ii) Associative law
   (iii) Distributive law
(c) List the applications of multiplexer.

7. (a) Define Priority Encoder.
(b) Explain the working of 1:4 demultiplexer with logic circuit & Truth Table.
(c) Explain the working of 4-bit parallel adder with logic circuit.
SECTION – IV

8. (a) With logic circuit and Truth table, explain the operation of clocked R S flip & mention its disadvantages.
     (b) What is Race around condition? In which flip flop it is overcome?
     (c) List the applications of flip/flop.

9. (a) Explain the working of 4 bit Parallel In Serial Out (PISO) with logic diagram and Truth Table.
     (b) Construct 4 bit Ring counter. Explain the working with Truth table & Timer diagram.

10. (a) Compare Synchronous & Asynchronous counter.
     (b) Realize Mod 6 counter with neat diagram and Truth Table.
     (c) Construct 4 bit ripple counter & explain its working with Truth Table & Timer diagram.