Total No. of printed pages = 3

Et/Co/It-403/DE/4th Sem/2016/N

DIGITAL ELECTRONICS

Full Marks – 70

Pass Marks – 28

Time – Three hours

The figures in the margin indicate full marks for the questions.

Answer any *five* questions.

1. (a) (i) $(0.6875)_{10} = (\ldots\ldots)_8$ 2×5=10

(ii) $(110110111)_2 = (\ldots\ldots)_{16}$

(iii) $(213.4)_{10} = (\ldots\ldots)_2$

(iv) $(36)_8 = (\ldots\ldots)_{BCD}$

(v) $(3A.2F)_{16} = (\ldots\ldots)_{10}$

(b) Perform : 2+2=4

(i) 10011 – 110 using 1's complement.

(ii) 110110 – 10001 using 2's complement.

[Turn over

2. (a) State and prove De Morgan's theorem. 8

(b) Explain with the help of truth table, the working of Universal gate. 3×2=6

3. (a) What is Karnaugh map ? Define pair, quad and Octet. 2+6=8

(b) Simplify the following function 'f' of four variables A, B, C and D. 6

$f(A, B, C, D) = \sum m (0, 1, 2, 3, 4, 5, 6, 7, 9, 11, 13, 15)$

4. (a) Explain with truth table and logic diagram the working of Half adder and Half subtractor. 5×2=10

(b) Enumerate the differences between combinational and sequential logic circuits. 4

5. (a) What do you mean by flip-flop and what are the different types of flip-flop ? Explain with the help of truth table the working principle of J-K flip-flop. 2+2+6=10

(b) What is Duality theorem ? Give examples. 4

6. What is shift register ? What are the different types of shift register ? Draw a 4-bit shift register and explain its operation. 2+2+10=14

7. Write short notes on any *two* : 7×2=14

   (a) LED and LCD display

   (b) TTL circuit

   (c) D-flip flop

   (d) Multiplexer.