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I Semester Diploma Examination, Nov./Dec., 2012  
Electronics & Communication Engg Board  
**DIGITAL ELECTRONICS-I**

Time : 3 Hours ]

[ Max. Marks : 100

Instructions : (1) Section No. - I is compulsory;  
(2) Answer any six full questions, choosing atleast two questions from the remaining sections.

**SECTION - I**

1 x 5 = 5

1. (a) Fill in the blanks :
- (i) The binary equivalent of  $(A1B)_{16}$  is \_\_\_\_\_.
  - (ii) The number of flip flops required for a decade counter are \_\_\_\_\_.
  - (iii)  $Y = \bar{A}B + AB$  is the Boolean expression of \_\_\_\_\_ gate.
  - (iv) EBCDIC stands for \_\_\_\_\_.
  - (v) In K-map, an octet eliminates \_\_\_\_\_ variables.
- (b) Explain 4:1 multiplexer. 5

**SECTION - II**

2. (a) Subtract binary 10111 from 11000 using 2's & 1's complement method. 6
- (b) (i) Convert  $(232.52)_{10}$  to Binary. 6  
(ii) Convert  $(436.5)_{10}$  to Hexadecimal. 3
- (c) Divide 11010 by 110. 3
3. (a) Write a note on ASCII code. 4
- (b) Add  $(776)_8$  &  $(677)_8$ . 3
- (c) Realise OR, AND & EX-OR gates using NOR gates only. 8

Turn over

Questionpaper

4. (a) Write the features of CMOS family.

(b) Simplify the following expression using K-map and draw the logic circuit for the reduced expression.

$$Y = \bar{A}\bar{B}C\bar{D} + \bar{A}B\bar{C}D + \bar{A}BCD + A\bar{B}\bar{C}D + A\bar{B}CD + ABCD$$

(c) Write the logic circuit for the expression  $Y = \bar{A}BC + B\bar{C}D + AC$ 

## SECTION - III

5. (a) Sketch and explain the functional logic circuit of Decimal to BCD encoder.

(b) Sketch and explain logic ckt. Of 1:4 demultiplexer.

6. (a) Sketch and explain the BCD to seven segment decoder.

(b) Explain the operation of decimal to binary encoder.

(c) Distinguish between Serial Adder &amp; Parallel Adder.

7. (a) Simplify :

(i)  $Y = [A\bar{B}(C+BD) + \bar{A} + \bar{B}]C$

(ii)  $Y = ABC + AB \cdot (\bar{A} \cdot \bar{C})$

(b) With gate level circuit, truth table, explain 2-bit magnitude comparator.

## SECTION - IV

8. (a) With logic circuit and truth table explain the operation of JKFF.

(b) Compare synchronous and asynchronous counters.

(c) List the applications of shift registers.

9. (a) With suitable sketches, explain the working of T- flip flop.

(b) Explain the working of serial-in, serial-out 4 bit shift register with truth table.

10. (a) Write the logic diagram and truth table of synchronous MOD-8 counter.

(b) Sketch and explain the working of Ring-Counter.

5

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B

Time : 3

Instruc

1. (a)

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9

9

(b)

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8

8

(a)

4

4

4

(b)

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3

3

(c)

5

5

5

(c)

10

10

10

(a)

8

8

8

(a)

7

7

7

(b)