BCA(II) — 204

# 2012

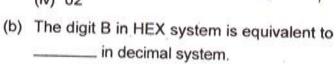*Time : 3 hours*

*Full Marks : 80*

*Candidates are required to give their answers in their own words as far as practicable.*

*The questions are of equal value.*

*Answer any* **five** *questions in which Q. No. 1 is compulsory.*

1. Choose the correct alternative for the following :

   (a) The number of digits in decimal system is :

       (i)  8

       (ii)  10

       (iii)  16

       (iv)  02

   *2808*

   (b) The digit B in HEX system is equivalent to _____ in decimal system.

       (i)   13

       (ii)  10

TX – 10/2                              ( Turn over )

(iii) 11

(iv) 12

(c) Which of the following binary numbers is equivalent to decimal 12 ?

(i)   1000          (ii)  1100

(iii) 1010          (iv)  0110

(d) Which of the following logic families is the fastest ?

(i)   RTL          (ii)  DTL

(iii) ECL          (iv)  CMOS

(e) Which of the following gates is the universal gate ?

(i)   OR          (ii)  AND

(iii) NOT          (iv)  NOR

(f) Flip-flop basically is a :

(i)   Astable multivibrator

(ii)  Mono-stable multivibrator

(iii) Bi-stable multivibrator

(iv)  None of these

(g) Which of the following circuits is an example of sequential circuit ?

(i)   Adder

(ii) Multiplexer

(iii) Decoder

(iv) Flip-flop

(h) How many Flip-flop are required for MOD 6 counter ?

(i) > 2  (ii) 3

(iii) 4  (iv) 5

2. Minimize the following Boolean function using K-map and implement the logic circuits using NOR gate :

f(A, B, C, D) = m {0, 3, 5, 6, 9, 10, 12,15}

3. What is multiplexer ? What are the different applications of multiplexer ? Draw 16 : 1 multiplexer using 4 : 1 multiplexer.

4. Draw the logic diagram and construct the excitation table of the following flip-flops :

(a) Clocked SR flip-flop, JK flip-flop, T flip-flop

(b) D flip-flop, Master slave JK flip-flop

5. Differentiate between the following :

(i) Analog Signal and Digital Signal

(ii) Combinational and Sequential Circuits

(iii) ROM and RAM

(iv) Registers and Counters

6. Explain the working principle with suitable diagram and mention the applications of the following :

(i) Schmitt Trigger

(ii) 555 Timer

7. Realize the following logic operations using NAND gate only :

(i) NOT

(ii) AND

(iii) OR

(iv) XOR

8. Explain different analog to digital converters.

9. Write short notes on any **two** of the following :

(a) Bi-stable Multi-vibrator

(b) Content Addressable Memory

(c) Field Programmable Gate Array

(d) Programmable Logic Array

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