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BIEL-030

DIPLOMA – VIEP – ELECTRONICS AND COMMUNICATION ENGINEERING (DECVI) / ADVANCED LEVEL CERTIFICATE COURSE IN ELECTRONICS AND COMMUNICATION ENGINEERING (ACECVI)

00816

Term-End Examination

June, 2016

BIEL-030 : DIGITAL ELECTRONICS

Time : 2 hours *Maximum Marks : 70*

Note : *Attempt any* ***five*** *questions. Question no.* ***1*** *is* ***compulsory.*** *Use of scientific calculator is allowed.*

1. Choose the correct answer for the following : *7×2=14*

(a) Convert the following binary number to decimal :

01011

(i) 11

(ii) 35

(iii) 15

(iv) 10

(b) How many bits are in an ASCII character ?

(i) 16

(ii) 8

(iii) 7

(iv) 4

(c) What is the major advantage of ECL logic ?

(i) Very high speed

(ii) Wide range of operating voltage

(iii) Very low cost

(iv) Very high power

(d) How is a J-K flip-flop made to toggle ?

(i) J = 0, K = 0

(ii) J = 1, K = 0

(iii) J = 0, K = 1

(iv) J = 1, K = 1

(e) How many inputs are required for a 1-of-16 decoder ?

(i) 2

(ii) 4

(iii) 8

(iv) 16

(f) The output of an AND gate with three inputs, A, B and C, is HIGH when

(i) A = 1, B = 1, C = 0

(ii) A = 0, B = 0, C = 0

(iii) A = 1, B = 1, C = 1

(iv) A = 1, B = 0, C = 1

(g) A binary code that progresses such that only one bit changes between two successive codes is

(i) Nine's-complement code

(ii) 8421 code

(iii) Excess-3 code

(iv) Gray code

2. (a) Design a Binary to Gray code converter. *7*

(b) Implement EXOR gate using only NAND gates. *4*

(c) What do you mean by self-complementing code ? *3*

3. With the help of a diagram, explain the operation of TTL NAND gate with totem pole output. *14*

4. Given $\gamma(A, B, C, D) = \Pi M(0, 1, 3, 5, 6, 7, 10, 14, 15)$. Draw the K-map and obtain the simplified expression. Realize the minimum expression using basic gates. *14*

5. Convert a J-K flip-flop into a D flip-flop and a T flip-flop. *14*

6. Draw the logic diagram of a 3-bit Serial In Serial Out (SISO) shift register and explain its working. *14*

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

   (a) Realization of NMOS inverter

   (b) Applications of Multiplexer, Demultiplexer and Flip-flops

   (c) Ring Counter