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BIEL-030

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

Term-End Examination

00176

June, 2015

BIEL-030 : DIGITAL ELECTRONICS

Time : 2 hours *Maximum Marks : 70*

Note : *Attempt any* ***five*** *questions. Question no. 1 is* ***compulsory.*** *All questions carry equal marks.*

1. Attempt all the multiple choice and *True/False* questions. *7×2=14*

   (a) A nibble is equal to 8 bits. [T/F]

   (b) One MB is equal to 1024 KB. [T/F]

   (c) A flip-flop is a sequential circuit. [T/F]

   (d) Ripple counter can be constructed from shift register. [T/F]

   (e) An octal system has

   (i) 4 digits

   (ii) 4 bytes

   (iii) 8 digits

   (iv) None of the above

(f) Which is a universal gate ?

(i) NAND

(ii) OR

(iii) NOT

(iv) None of the above

(g) How many flip-flops are required for 4-bit register ?

(i) 2

(ii) 3

(iii) 4

(iv) None of the above

2. Simplify the Boolean function

$F = \left\{ \overline{(\overline{A+\overline{B}}) + (\overline{A+\overline{B}})} \right\}$ using Boolean's law. Also draw the Logic diagram and make Truth Table. *14*

3. (a) (i) Convert the Decimal number 43·125 to Binary.

(ii) Convert the Decimal number 19·5 to Octal. $2 \times 3\frac{1}{2} = 7$

(b) Why is Excess-3 code self-complementary code ? Explain with example. *7*

4. (a) Explain and design 3-bit synchronous counter.

(b) Give the symbol and Truth Table of EX-OR Gate and EX-NOR Gate. Construct an EX-OR gate using NAND gates only. *2×7=14*

5. Simplify the following Boolean function in SOP and POS forms by means of K-map. Also draw the Logic diagram and Truth Table of output function

$F(A, B, C, D) = \Sigma(0, 2, 8, 9, 10, 11, 14, 15)$. *14*

6. What is multiplexer ? What are the applications of multiplexer ? Design a 16 × 1 multiplexer using 4 × 1 multiplexer. *14*

7. Draw the diagram of the following flip-flops. Also construct the excitation table : *2×7=14*

   (a) D-flip-flop, T-flip-flop

   (b) Clocked S-R flip-flop with preset and clear, and write the drawbacks of S-R flip-flop.

8. Write short notes on any ***four*** of the following : $4 \times 3\frac{1}{2} = 14$

   (a) A/D and D/A Converter
   (b) Master Slave Flip-Flop
   (c) Demultiplexer
   (d) Moore/Mealy Machine
   (e) PMOS