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BIEE-017

B.Tech. – VIEP – ELECTRICAL ENGINEERING (BTELVI)

00343

Term-End Examination

December, 2016

BIEE-017 : DIGITAL ELECTRONICS

Time : 3 hours *Maximum Marks : 70*

Note : *Attempt any **five** questions. All questions carry equal marks. Missing data may be suitably assumed. Use of scientific calculator is permitted.*

1. (a) Find the complement of F = wx + yz and then show that $F \cdot \overline{F} = 0$ and $F + \overline{F} = 1$. 7

(b) Given two eight-bit strings, A = 10110001 and B = 10101100, evaluate the following : 7

(i) NOT A

(ii) NOT B

(iii) AND

(iv) OR

(v) XOR

2. (a) Prove that the dual of the EX-OR is also its complement. 7

(b) Implement the following four Boolean expressions with three half adders : 7

$$D = A \oplus B \oplus C$$

$$E = \bar{A}BC + A\bar{B}C$$

$$F = AB\bar{C} + (\bar{A} + \bar{B})C$$

$$G = ABC$$

3. Define the term combinational circuit and give its simple block diagram representation. Design a combinational circuit for BCD to excess-3 code converter. 14

4. Explain the operation of a 4-bit adder/subtractor circuit with the help of a clearly labelled logic diagram and a simple mathematical example. How do the circuit defects overflow, if any exist ? 14

5. What is a Read Only Memory (ROM) ? Give a simple block diagram of a ROM. Clearly explain the working principle of a ROM with the help of an internal logic diagram of a 32×8 ROM. 14

6. Give the architectural structure of the following :

(a) 8085 microprocessor

(b) 8086 microprocessor

What are the basic differences between the two ? 14

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

(a) Addressing Modes of 8085

(b) Instruction Format of 8086

(c) Comparison of 8088 with 8086