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BIEE-017

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

00823

Term-End Examination

June, 2018

BIEE-017 : DIGITAL ELECTRONICS

Time : 3 hours *Maximum Marks : 70*

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

1. Simplify the following using Boolean algebra : *5×2=10*

(a) $\bar{A} + A\bar{B}C + ABC$

(b) $\bar{A}\,\bar{B}\,\bar{C} + \bar{A}BC + ABC + A\bar{B}\,\bar{C} + A\bar{B}C$

(c) $ABC + AB\bar{C} + A\bar{B}C$

(d) $ABCD + A\bar{B}CD + ABC\bar{D} + AB\bar{C}D + AB\bar{C}\,\bar{D}$

(e) $\overline{A\bar{B}C + AB\bar{C}}$

2. (a) Use Karnaugh map to simplify and implement

$F(A, B, C, D) = \sum m(0, 4, 10, 11, 14, 15)$. 5

(b) Draw the truth table and logic circuit of the following : 5

$$Y = AB + A + A\bar{B}C + ABC$$

3. (a) Design a full adder using half adder. 5

(b) Implement a half subtractor using NAND gates only. 5

4. (a) What is meant by SOP and POS forms of Boolean expressions ? Give examples. 5

(b) Reduce and find the simplified SOP form 5

$$Y = \pi M(0, 1, 2, 3, 4, 6, 10, 11, 13)$$

5. Design a ring counter which can count '16' states. 10

6. Draw and explain the block diagram of architecture of 8086. 10

7. (a) What are the various addressing modes of 8085 ? 5

(b) What is race-around condition in flip-flops ? How can Master-Slave JK flip-flop eliminate it ? 5

8. Design a 2-bit magnitude comparator using NAND gates only. 10

9. What are shift-registers ? Explain 'SISO' shift register in detail. *10*

10. Write short notes on any ***two*** of the following : *2×5=10*

(a) Interrupts in 8085

(b) 'BCD' Adder

(c) Differences between Combinational and Sequential Circuits