B.Tech. – VIEP – ELECTRONICS AND COMMUNICATION ENGINEERING (BTECVI)

OO519

Term-End Examination

December, 2017

BIEL-003 : DIGITAL ELECTRONICS

Time : 3 hours   *Maximum Marks : 70*

Note : *Attempt any **seven** questions. Assume any missing data suitably. Use of scientific calculator is allowed.*

1. (a) For a given number $(4246)_8$, obtain its equivalent excess-3 code and gray code.   5

   (b) Simplify the given Boolean expression using Boolean Algebra
   $$F(x, y, 3) = \pi_m(3, 5, 7).$$ 5

2. (a) Design and implement a half subtractor using universal gates.   5

   (b) Differentiate between decoder and demultiplexer.   5

3. (a) Explain SR flip-flop using truth table. Also write its drawbacks. *5*

(b) Design a Mod-5 ripple up counter. *5*

4. (a) Reduce the following function using K-map technique : *5*

$f(A, B, C, D) = \pi (0, 3, 4, 7, 8, 10, 12, 14) + d (2, 6)$

(b) Derive T flip-flop using JK flip-flop. *5*

5. (a) Compare and contrast the features of TTL and CMOS logic families. *5*

(b) Explain the following terms : *5*
(i) Fan-in
(ii) Tristate gates

6. (a) Write short notes on PROM and EPROM. *5*

(b) Explain the principle of operation of bipolar SRAM cell. *5*

7. (a) Give the classification of semiconductor memories. *5*

(b) Implement the function with a MUX : *5*

$F (A, B, C, D) = \Sigma (0, 1, 3, 4, 8, 9, 15)$

8. Using K-map method obtain the minimal SOP and POS expressions for the function

$F (x, y, z, w) = \Sigma (1, 3, 4, 5, 6, 7, 9, 12, 13).$ *10*

9. (a) Draw a circuit of 2×1 MUX and 1×2 De-MUX. 5

(b) Write notes on the following : 5
   (i) PLA
   (ii) Flash Memory

10. Draw a six-stage ring counter and explain its operation. 10

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