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BIELE-011

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

00813

Term-End Examination

June, 2018

BIELE-011 : DIGITAL SYSTEM DESIGN

Time : 3 hours *Maximum Marks : 70*

Note : *Attempt any **seven** questions. All questions carry equal marks. Use of scientific calculator is allowed.*

1. Given the logic function of five variables *10*

$$f(A, B, C, D, E) = (A + \overline{BC})\,\overline{(D + BE)}$$

express the function as a sum of products. Also implement function(f) using NOR gates only.

2. (a) What is the ROM ? Give the applications of ROM and PROM. *5*

(b) Explain the PLAA and FPLA programming structure. *5*

3. (a) How can you differentiate 'Mealy' and 'Moore' models of sequential machines ? Explain it using structural diagram. *5*

(b) Explain the principle of operation of path sensitisation method. *5*

4. (a) Write an application of RS-422 in system control design. *5*

   (b) Discuss the concepts and basic features of programmable system controller. *5*

5. Design a 4-bit binary up-down ripple counter with D flip-flop. *10*

6. What is a MSI decoder ? How can it be used for design of a system controller ? *10*

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

   (a) Asynchronous Finite State Machines

   (b) Hazard, Cycles and Races

   (c) MC 2900

8. Write the VHDL code for a full adder using behavioural and structural modeling. *10*

9. Implement the following function with an 8 : 1 multiplexer : *10*

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