

Roll No.

402**B. E. (Fourth Semester) EXAMINATION, June, 2009**

(Old Scheme)

(Common for CS, EC, EI & BM Engg.)

DIGITAL CIRCUITS AND SYSTEMS*Time : Three Hours**Maximum Marks : 100**Minimum Pass Marks : 35*

Note : Attempt any *five* questions. All questions carry equal marks. Assume any missing data.

1. (a) Minimize the logic function and realize using universal gate :

$$f(A, B, C, D) = AB\bar{C}\bar{D} + \bar{A}BCD + ABCD + A\bar{B}\bar{C}\bar{D} + \bar{A}\bar{B}C\bar{D}$$

- (b) Express the functions as sum of minterms and product of maxterm :

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

$$F(x, y, z) = 1$$

Or

2. (a) Simplify the Boolean function F using the don't care condition d in product of sum form :

$$F = \bar{A}\bar{B}\bar{D} + \bar{A}CD + \bar{A}BC$$

$$d = \bar{A}B\bar{C}\bar{D} + ACD + A\bar{B}D$$

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- (b) Minimize the logic function using K-map and realize using NOR gate :

$$f = \Sigma (0, 1, 4, 5, 7, 10, 11, 14, 15)$$

3. (a) Design the full adder circuit using K-map and realize the Boolean equation using NAND gate.
 (b) Design the half subtractor and realize the equation using NOR gate.

Or

4. (a) Discuss the logic circuit of look-ahead carry generator.
 (b) What do you mean by flip-flop ? Draw and explain the logic circuit of J-K flip-flop.
 5. (a) Explain the working of a bistable multivibrator.
 (b) Explain TTL and ECL logic families with an example.

Or

6. (a) Design a MOD-9 counter.
 (b) Explain serial-in-serial-out and parallel-in-parallel-out type of registers.
 7. (a) Write a short note on sample and hold circuit.
 (b) Discuss any *one* technique to convert analog to digital conversion.

Or

8. (a) Explain the types of semiconductor memories.
 (b) Explain the operation of a Schmitt trigger and its applications.
 9. Define the following terms :
 (a) Fan-in, Fan-out

- (b) Encoder, Decoder
- (c) Sequential, Combinational circuits
- (d) PLA

Or

10. Write short notes on any *two* of the following :

- (a) CMOS logic
- (b) BCD counter
- (c) V—F converter