

D 20623-A

(Pages : 2)

Name.....

Reg. No.....

**THIRD SEMESTER B.TECH. (ENGINEERING) DEGREE
EXAMINATION, OCTOBER 2011**

$\frac{EC\ 09\ 305}{PTEC\ 09\ 304}$ DIGITAL ELECTRONICS

(2009 admissions)

Time : Three Hours

Maximum : 70 Marks

Part A

Answer all questions.

1. Generate EX-OR functions using only NOR gates.
2. Simplify the Boolean function using 4-variables map :
$$F(A, B, C, D) = \Sigma(0, 1, 2, 4, 5, 7, 11, 15).$$
3. Convert the hexadecimal number F3A7C2 to binary.
4. Draw the simple SR latch.
5. What is meant by a sequential circuit ?

(5 × 2 = 10 marks)

Part B

Answer any four questions.

6. Convert the following expression into sum of products and product of sums :—
$$(AB + C)(B + \bar{C}D).$$
7. Draw the logic diagram of 4×1 multiplexer.
8. Explain the working principle of TTL NAND gate.
9. Construct a 4-bit bidirectional shift register.
10. Simplify using 5-variable map :
$$F(A, B, C, D, E) = \Sigma(0, 1, 4, 5, 16, 17, 21, 25, 29).$$
11. What is Mealy and Moore model ?

(4 × 5 = 20 marks)

Part C

Answer section (a) or section (b) of each question.

12. (a) Simplify using Quine-Mc Cluskey method :

$$P(A, B, C, D, E, F, G) = \Sigma(20, 28, 38, 39, 52, 60, 102, 103, 127).$$

Or

Turn over

- (b) (i) Design a combinational circuit with three inputs x, y and z and three outputs A, B and C .
When the binary input is 0, 1, 2, or 3, the binary output is one greater than the input.
When the binary input is 4, 5, 6 or 7, the binary output is one less than the input. (6 marks)
- (ii) Give example for Maxterm and Minterm expansions. (4 marks)
13. (a) Draw the logic diagram of 4-bit full adder with look ahead carry and explain the operation. (10 marks)
- Or*
- (b) Explain the operation of emitter coupled logic with neat diagram. (10 marks)
14. (a) Construct a 4-bit updown counter with T-flip flops. (10 marks)
- Or*
- (b) Explain SISO, SIPO, PISO and PIPG shift registers. (10 marks)
15. (a) (i) Design a counter with the following repeated binary sequence, using D flip-flops :
0, 1, 2, 4, 6. (5 marks)
- (ii) Construct a MOD-10 counter. (5 marks)
- Or*
- (b) (i) Explain the design of simple synchronous machines with example. (6 marks)
- (ii) Explain how ASM chart differs from a conventional flowchart. (4 marks)

[4 × 10 = 40 marks]