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Total No. of Pages : 02

Total No. of Questions : 09

B.Tech.(EIE) (2011 & Onwards) (Sem.-4)

DIGITAL ELECTRONICS

Subject Code : EC-204

M.Code : 57011

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A**1. Answer briefly :**

- a) Convert the binary number 1011001011 into (a) octal (b) hexadecimal
- b) Convert gray code 101011 into its binary equivalent?
- c) Subtract $(111001)_2$ from $(101011)_2$ using 2's complement method?
- d) What do you mean by positive and negative logic?
- e) Draw the logic diagram for logic equation $Y = (A + B).C$.
- f) Give the comparison between PROM and PLA.
- g) What is race around condition in flip-flops?
- h) The t_{pd} for each flip-flop is 50 ns determine the maximum operating frequency MOD-32 ripple counter?
- i) Give the specifications of A/D converters?
- j) Why totem pole outputs cannot be connected together?

SECTION-B

2. Simplify the given logic equation using Boolean algebra.

$$Y = P + \bar{P}Q\bar{R} + \overline{Q + R}$$

3. Minimize the following using K-map

$$f_1(w, x, y, z) = \sum (0, 1, 5, 7, 8, 14) + \sum d (2, 11)$$

and implement the minimized function using only NAND gates.

4. Explain the principle of operation of a dual slope ADC. How is it advantageous over ramp type ADC?
5. Explain the working of a full subtractor with neat diagram and truth table.
6. Draw the circuit diagram of a 4-bit serial in/serial out shift register using D flip-flops. Also draw its timing diagram.

SECTION-C

7. Explain the basic circuits of ECL and tristate logic. Compare TTL and ECL with respect to fan-in, fan-out, noise margin and propagation delay time.
8. a) Explain the operation of successive approximation type of ADC.
- b) If \bar{Q} output of a D type flip-flop is connected to D input, it acts as a toggle switch verify?
9. Write short notes on **Any Two** :
- a) SR flip-flop
- b) PLA
- c) Gray code and Excess-3-code.

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.