Roll No. | | | | | | | | | | | | 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) Covert 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 compliment 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.

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

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 $\overline{Q}$ 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.