Sep-21-00033

B.Tech. EXAMINATION, 2021

Semester III (CBCS)

DIGITAL ELECTRONICS

(ECE, EE, EEE, CSE, IT)

EC-302

Time : 2 Hours   *Maximum Marks :* 60

The candidates shall limit their answers precisely within 20 pages only (A4 size sheets/assignment sheets), no extra sheet allowed. The candidates should write only on one side of the page and the back side of the page should remain blank. Only blue ball pen is admissible.

Note : Attempt *Four* questions in all, selecting *one* question from any of the Sections A, B, C and D. Q. No. **9** is compulsory.

Section A

1. (a) (i) Divide the binary number $(10011011)_2$ by $(100)_2$.   **5**

(ii) Subtract the binary number $(110111)_2$ by $(110001)_2$.

(b) Let two decimal numbers M = 236 and N = 132 perform the operation M—N and N—M using 2's complement method. **5**

(c) Perform the addition of the following numbers in BCD (8-4-2-1) : **5**

(i) 191 + 171

(ii) 917 + 215.

2. (a) Write a short note on error detection and correction codes. **7½**

(b) Explain Fan-In, Fan-Out of logic gates. **7½**

Section B

3. Solve the function :

F(A, B, C, D) = Σm(0, 1, 3, 7, 8, 9, 11, 15) using Quine MC-clusky method (Tabular method). **15**

4. Explain and implement TTL with totem pole output and ECL circuit. **15**

Section C

5. What is Full adder circuit ? Explain. Implement the output of full adder using two half adders and implement sum of full adder using 4 : 1 Mux. **15**

6. What are the different characteristics of digital ICs ? Explain in detail. **15**

Section D

7. What do you mean by Racing in J-K flip-flop ? How this stigma of J = 1, K = 1 is removed in master slave configuration ? Explain the working of Master slave J-K flip-flop. **15**

8. Design and implement BCD/Decade counter. **15**

(Compulsory Question)

9. Attempt any *five* questions : **5×3=15**

(i) Implement EX-OR gate using NAND gate only.

(ii) Design and implement CMOS inverter circuit.

(iii) What is Shift Register ? Explain the working of SIPO shift register.

(iv) Explain the difference between Synchronous counter and Asynchronous counter with example.

(v) What is Static and Dynamic Memory ?

(vi) Write a short note on classification of memories.