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BOARD DIPLOMA EXAMINATION, (C-16)

JANUARY/FEBRUARY—2022

DEEE - FIFTH SEMESTER EXAMINATION

DIGITAL ELECTRONICS AND MICROCONTROLLERS

Time : 3 hours]　　　　　　　　　　　　　　　　　　　　[*Total Marks* : 80

PART—A　　　　　　　　　　　　3×10=30

Instructions :　(1) Answer **all** questions.

　　　　　　　　(2) Each question carries **three** marks.

　　　　　　　　(3) Answers should be brief and straight to the point and shall not exceed five simple sentences.

1. Convert the following numbers into decimal :

　(a) $(11011)_2$　　*(b)* $(22.70)_8$　　　*(c)* $(2BD)_{16}$

2. Define Fan-in and Fan-out capacity of a digital IC.

3. Mention any three applications of a Multiplexer.

4. Draw the logic diagram of 1-Bit comparator and write its truth table.

5. State the necessity of Clock in Flip-Flops. Mention the types of triggering in Flip-Flop.

6. Distinguish between Synchronous and Asynchronous counters.

7. Mention any six types of Registers used in 8051 Microcontroller.

8. State the alternate function of part-3 of 8051 Microcontroller.

9. Give the different between Machine level and Assembly level programming.

10. List any three Arithmetic instructions of 8051 with examples.

PART—B

10×5=50

Instructions : (1) Answer *any* **five** questions.

(2) Each question carries **ten** marks.

(3) Answers should be comprehensive and criterion for valuation is the content but not the length of the answer.

11. *(a)* Perform the subtraction of binary numbers using 2's complement method :

(i) $(101011)_2 - (11001)_2$

(ii) $(100100)_2 - (100011)_2$ 5

(b) Compare the TTL, CMOS and ECL logic families. 5

12. Explain 2's Complement parallel Adder/Subtractor circuit. 10

13. *(a)* Draw and explain BCD to Decimal Decoder. 5

(b) Draw and explain 4×1 multiplexer. 5

14. Explain the working of Master Slave JK Flip-Flop circuit with necessary diagrams. 10

15. Draw and explain the working of 4-bit bi-directional shift register. 10

16. Explain the 8051 Microcontroller pin configuration and specify the purpose of each pin. 10

17. *(a)* Explain Unconditional and Conditional jump instructions in 8051 Microcontroller. 5

(b) Define subroutine and explain its use. 5

18. *(a)* Write a program to add two 8-bit numbers stored in memory 2400H and 2401H. Store the result in 2402H and 2403H. 5

(b) Explain the terms operation code and operand instructions with example. 5

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