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BOARD DIPLOMA EXAMINATION, (C-16)

JUNE/JULY—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. Subtract 101.11 from 1100.1 by using 2's complement method.

2. Define the terms *(a)* propagation delay, *(b)* noise margin and *(c)* fan-in and fan-out.

3. Draw the logic circuit of half-adder using AND and EX-OR gates and give its truth table.

4. Compare the performance of serial and parallel adder.

5. Draw circuit diagram for NAND latch and write its truth table.

6. What is a shift register? List different types of shift registers.

7. List the various status flags in the PSW register.

8. List the timer modes in 8051 microcontroller.

9. Explain PUSH and POP instructions.

10. Explain opcode and operand with examples.

PART—B

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) Explain AND, OR, NOT, NAND, NOR gates with truth table.   5

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

12. Draw the circuit diagram of full adder using two half adders and an OR gate and explain its working with truth table.   10

13. (a) Draw the logic circuit of 4×1 multiplexer and give its truth table. 5

(b) Draw the circuit diagram of 3×8 decoder with truth table.   5

14. Explain the operation of J-K master-slave flip-flop with a neat sketch.   10

15. Explain the working of 4-bit synchronous counter with a circuit and timing diagram.   10

16. Draw the pin out diagram of 8051 microcontroller and state the function of each pin.   10

17. Explain any five addressing modes of 8051 with an example of each.   10

18. (a) Distinguish between machine language and assembly language. 5

(b) Explain the following arithmetic instructions with an example of each.   5

(i) ADD A, @ R_i
(ii) MUL AB
(iii) SUBB A, direct
(iv) INC DPTR
(v) DEC direct

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