7649

BOARD DIPLOMA EXAMINATION, (C-20)

OCTOBER / NOVEMBER—2023

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 binary number 10010.1011 into octal and hexadecimal numbers.

2. Write the classification of digital logic families.

3. Draw half-adder circuit using NAND gates only.

4. Draw 3 to 8 decoder circuit.

5. Distinguish between synchronous and asynchronous counters.

6. Classify various types of memories based on accessing modes.

7. List any six resisters of 8051 microcontroller.

8. Write about Program Status Word Register in 8051.

9. Define Instruction Cycle.

10. Define the terms opcode and operand of an instruction with an example of each.

PART—B

8×5=40

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

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

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

11. *(a)* Draw the symbols and explain the operation of Ex-OR gate and NAND gate with their truth tables. 6

(b) State De Morgan's theorem. 2

(OR)

Explain the characteristics of digital ICs *(i)* Logic levels *(ii)* Propagation delay *(iii)* Noise margin and *(iv)* Fan-in.

12. *(a)* Realize full adder using two half adders and an OR gate and write its truth table. Explain the operation. 8

(OR)

(b) Draw and explain the operation of BCD to decimal decoder. 8

13. *(a)* Draw the circuit of level clocked J-K flip-flop using S-R flip-flop and explain with truth table. 8

(OR)

(b) Draw and explain the working of 4-bit bidirectional shift register.

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14. *(a)* Draw the pin diagram of 8051 microcontroller and specify the purpose of each pin. 8

(OR)

(b) Explain unconditional and conditional JUMP instructions in 8051 microcontroller.

15. *(a)* Explain any four arithmetic instructions with examples in 8051 microcontroller. 8

(OR)

(b) Explain any four addressing modes of 8051 microcontroller with examples.

PART—C

Instructions : (1) Answer the following question.

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

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

16. Write an assembly language program to find the sum of a series of integers, whereas the length of the series is stored at 8100H and the integers are stored from 8101H. Save the sum and carry in two locations at the end of the series.

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