C16-EC–303

6234

BOARD DIPLOMA EXAMINATION, (C-16)

MAY/JUNE—2023

DECE - THIRD SEMESTER EXAMINATION

DIGITAL ELECTRONICS

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 decimal numbers into binary numbers :

(a) $(84.6)_{10} = (\ )_2$

(b) $(26.14)_{10} = (\ )_2$

2. Subtract 101010 from 110111 using 2's complement method.

3. State De Morgan's theorems.

4. Classify different logic families.

5. Draw full adder circuit using two half adders and an OR gate.

6. Write any three differences between serial adder and parallel adder.

7. List any three applications of flip-flops.

8. Write any three differences between synchronous and asynchronous counters.

9. Draw the symbols of T and D flip-flops and write their truth tables.

10. Write any three differences between EEPROM and UVEPROM.

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. Realize AND, OR, NOT operations using *(a)* only NAND gates and *(b)* only NOR gates. 10

12. Minimize the following expression using Karnaugh map technique and realize the result with logic gates :

$$Y = A\bar{B}C + \bar{A}\bar{B}C + \bar{A}\bar{B}\bar{C} + A\bar{B}\bar{C} + \bar{A}BC$$ 10

13. Explain the working of open collector TTL NAND gate with a circuit diagram. 10

14. Draw 4-bit parallel 2's complement adder/subtractor circuit and explain its working. 10

15. Explain the working of 3×8 decoder with circuit diagram. 10

16. Draw and explain the working of 4-bit decade counter with a diagram. 10

17. *(a)* Explain level clocked JK flip-flop with truth table. 7

(b) What is race around condition? How to avoid it? 3

18. Draw and explain the working of 4-bit shift left register with a diagram. 10

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