7241

BOARD DIPLOMA EXAMINATION, (C-20)

NOVEMBER/DECEMBER—2022

DECE – THIRD SEMESTER EXAMINATION

DIGITAL ELECTRONICS

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

PART—A　　　　　　　　　　　3×10=30

Instruction : (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 to decimal numbers.

    (a)　$(11011)_2$

    (b)　$(2B8)_{16}$

2. Construct EX-OR gate using only NOR gates.

3. Simplify the given Boolean expression using Boolean laws.

$$\bar{A}B + AB + \bar{A}\bar{B}$$

4. List six important characteristics of logic families.

5. Compare serial adder with parallel adder.

6. Draw the logic diagram of 2×4 decoder.

7. Explain the need for a tri-state buffer.

8. State the need for preset and clear inputs.

9. What is the necessity of registers? Explain,

10. Classify different types of semiconductor memories.

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)* Explain the working of open collector output TTL NAND gate with circuit diagram.

(OR)

(b) Explain the working of CMOS TTL NAND gate with circuit diagram.

12. *(a)* Explain working of 1×4 de-multiplexer with logic circuit diagram.

(OR)

(b) Explain the working of a 4-bit parallel adder using full adders with circuit diagram.

13. *(a)* Explain the NAND and NOR latches with truth tables.

(OR)

(b) Explain the working of 4-bit shift right register with circuit diagram.

14. *(a)* Explain the working of 4-bit synchronous counter with circuit diagram.

(OR)

(b) Explain with circuit diagram the working of clocked SR flip-flop using NAND gates.

15. *(a)* Explain the working of diode ROM with circuit diagram.

(OR)

(b) *(i)* Differentiate between flash ROM and NVRAM.

(ii) Mention any three uses of SD card.

PART—C

10×1=10

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. An AND gate followed by NOT gate gives NAND gate, but the NOT gates are connected at the inputs of AND gate is it works as NAND gate or not. If not what is its truth table and resultant gate.

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