C20-CM–**302**

# 7235

**BOARD DIPLOMA EXAMINATION, (C-20)**

**OCTOBER/NOVEMBER—2024**

**DCME – THIRD SEMESTER EXAMINATION**

DIGITAL ELECTRONICS

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

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**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 $(42.5)_{10}$ into binary.

2. Give the table showing hexadecimal digits from 0 to 15 and its binary values.

3. State de-Morgan's theorem.

4. Give the EX-OR gate logic symbol with truth table.

5. Define positive and negative logic levels.

6. Define triggering.

7. List the types of counters.

8. State the need of a register.

9. Define the term decoder.

10. List the applications of multiplexer.

**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)* Convert $(10101110)_2$ into decimal and $(10100110)_2$ into hexadecimal.

**(OR)**

*(b)* Draw and explain the Excess-3 codes with BCD codes in a table and explain one example.

**12.** *(a)* Simplify the Boolean expression $Y = \bar{A}\bar{B}C + \bar{A}BC + AB\bar{C} + A\bar{B}\bar{C}$ using k-map method to their minimum sum of products form and realize using basic gates.

**(OR)**

*(b)* Construct full adder using two half adders and an OR gate.

**13.** *(a)* Explain the working of NAND latch circuit with truth table and timing diagram.

**(OR)**

*(b)* Explain with block diagram and truth tables the working of D-flip-flop.

**14.** *(a)* Draw and explain module-16 ripple counter circuit diagram with truth table.

**(OR)**

*(b)* Explain the working of universal shift register.

**15.** *(a)* Draw and explain the operation of 1×4 de-multiplexer circuit diagram with truth table.

**(OR)**

*(b)* Explain programmable logic array (PLA).

# 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.** Explain the working of functional difference between up/down Counter and up/down asynchronous counter with a circuit diagram.

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