



C14-CM-303/C14-IT-303

4233

**BOARD DIPLOMA EXAMINATION, (C-14)**  
**MARCH/APRIL—2017**  
**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. Draw the truth symbols and truth tables for the following gates : 1½×2=3
  - (a) NOT
  - (b) NOR
2. Draw the diagram of serial adder. 3
3. Differentiate between serial adder and parallel adder. 1½×2=3
4. Define positive and negative logic levels. 1½×2=3
5. Draw the symbol and truth table of T flip-flop. 1½×2=3
6. Draw the NOR latch with truth table. 1½×2=3
7. List the applications of counter. 1×3=3
8. Explain the use of shift register as a memory. 3

- \* 9. What are the classifications of memories based on accessing modes? 1×3=3
10. Write the applications of multiplexer. 1×3=3

**PART—B**

10×5=50

**Instructions :** (1) Answer *any five* questions.

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

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

11. (a) Realize the AND, OR and NOT gates using NAND gate. 5  
 (b) Simplify the following expression : 5

$$AB + A(B + C) + B(B + C)$$

12. Draw and explain a logic circuit of a half-adder. Derive the expression for both carry and sum output from its truth table. 3+3+2+2=10

13. Draw and explain the working of clocked *J-K* flip-flop. 4+6=10

14. Explain with block diagram the waveforms, the truth table and the working of *R-S-T* flip-flop. 2+2+2+4=10

15. Draw and explain 4-bit ring counter. 4+6=10

16. Draw and explain the working of 4-bit shift right register. 4+6=10

17. Briefly explain the data movement in the following registers : 5+5=10

(a) Serial-in-serial-out

(b) Parallel-in-parallel-out

18. (a) State the need for a programmable counter using flip-flop. 5  
 (b) List any five applications of decoders. 5

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