



C14-CM-303/C14-IT-303

4233

BOARD DIPLOMA EXAMINATION, (C-14)
OCT/NOV—2017
DCME—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. State De Morgan's theorem. 1½+1½=3

2. Draw a half-adder circuit using an XOR gate and an AND gate.

3. Simplify the Boolean function $F = A\bar{B}\bar{C} + \bar{A}B\bar{C} + \bar{A}\bar{B}C$ using k -maps.

4. Define positive and negative logic levels. 1½+1½=3

5. Draw the NOR latch and write its truth table.

6. Distinguish between synchronous and asynchronous inputs of a flip-flop.

- * 7. List the applications of counters.
- 8. List different types of registers.
- 9. Distinguish between static RAM and dynamic RAM.
- 10. Write the applications of multiplexer.

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) Write SOP (Sum of Products), POS (Product of Sums) expressions for the below representations : 2+2=4

$$f(ABC) \quad m(0, 2, 3, 4, 6)$$

- (b) Find the complement of the expression

$$y \quad ABC \quad ABC \quad \bar{A} \bar{B} C \quad \bar{A} B C \quad 3$$

- (c) Simplify the Boolean function to a minimum number of literals by applying the Boolean postulates

$$y \quad (A + B)(A + \bar{B})(\bar{A} + C) \quad 3$$

- 12. Draw and explain 2's complement adder-subtractor circuit.
- 13. Explain the working of T (toggle) flip-flop with block diagram and write its truth table.
- 14. Explain the working of J-K master slave flip-flop with suitable diagram and truth table.
- 15. Draw and explain a mod-8 ripple counter.
- 16. (a) Draw a 4-bit synchronous counter. 5
(b) Explain 4 × 1 multiplexer with diagram. 5
- 17. Draw and explain the working of 4-bit shift right register.
- 18. Draw and explain a 4-bit serial in-parallel out register.
