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C14–CM–303/C14–IT–303

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BOARD DIPLOMA EXAMINATION, (C–14)

MARCH/APRIL—2018

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. Draw the symbols and truth tables of basic gates. 1+1+1

2. State De Morgan's laws. 1½+1½

3. Draw and explain the logic circuit of a half-adder. 1+1+1

4. Explain the levels of integration. 3

5. Define the terms *(a)* compatibility and *(b)* fan-out. 1½+1½

6. Define the terms *(a)* preset input and *(b)* clear input. 1½+1½

7. List the applications of counters. 3

8. Distinguish between ROM and RAM. 3

9. Define a register. 3

10. Define the terms *(a)* multiplexer and *(b)* encoder. 1½+1½

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. Explain the working of 4-bit parallel adder with the help of suitable circuit and example. 5+5

12. Reduce the following function using K-map technique : 10

$F(A, B, C, D)$ $m(1, 3, 4, 5, 7, 9, 11, 13, 15)$

13. Draw and explain the working of *R-S* flip-flop using NAND gates. 3+3+4

14. With a neat sketch, explain the working of edge triggered *J-K* flip-flop. 3+3+4

15. Draw the diagram of Mod–16 synchronous counter and explain the operation with the help of timing diagram. 3+3+4

16. *(a)* List the drawbacks of ripple counter. 5

(b) Draw the circuit diagram of multiplexer and explain the operation. 2+3

17. Draw and explain the working of shift right register. 4+6

18. Draw and explain the operation of IC 74194 universal shift register. 4+6

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