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C14–EC–305

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BOARD DIPLOMA EXAMINATION, (C–14)

MARCH/APRIL—2016

DECE—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.

1. State deMorgan's theorems.

2. Explain the use of alphanumeric codes *(a)* ASCII and *(b)* EDCDIC.

3. Convert $(11011011)_{gray}$ into binary code.

4. Define the terms *(a)* noise margin, *(b)* fan-in and *(c)* fan-out.

5. Draw the logic circuit of decimal to BCD encoder.

6. Distinguish between serial and parallel binary adders.

7. Construct *J-K* flip-flop using *S-R* flip-flop.

8. What is the necessity of clock in flip-flops? List the types of triggering.

9. State the need for a register.

10. Distinguish between synchronous and asynchronous counters.

PART—B

10×5=50

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

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

11. Using the Karnaugh map method, simplify the following expression to its minimum sum of product form and realize using basic gates :

$Y \quad \overline{A}\overline{B}\overline{C}\,\overline{D} \quad \overline{A}\overline{B}\overline{C}D \quad \overline{A}\overline{B}C\overline{D} \quad \overline{A}\overline{B}C\,\overline{D} \quad \overline{A}BC\overline{D} \quad AB\overline{C}\overline{D} \quad A\overline{B}C\overline{D}$

12. *(a)* Realize the basic gates using NOR gates only. 4

(b) Convert $(974\ \ 35)_{10}$ into octal number. 3

(c) What are the minterms and maxterms? 3

13. Draw and explain the working of open collector TTL NAND gate circuit.

14. Draw and explain the working of 4×1 multiplexer circuit and give its truth table.

15. Draw and explain the operation of full-adder circuit with truth table and construct full adder using two half adders.

16. Explain the working of 4-bit bidirectional shift register with a circuit and timing diagram.

17. *(a)* Explain clocked T flip-flop with the help of truth table and circuit. 6

(b) Draw and explain the circuit of NAND latch and write truth table. 4

18. *(a)* Explain the working of basic dynamic MOSRAM cell. 5

(b) Explain the basic principle of working of diode ROM. 5

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