



C14-EC-305

4241

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  $(11011011)_{\text{gray}}$  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.

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**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 :

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

**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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