



C09-EC-305

3237

**BOARD DIPLOMA EXAMINATION, (C-09)
MARCH/APRIL—2017
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.

(3) Answers should be brief and straight to the point and shall not exceed *five* simple sentences.

1. Convert the following binary numbers into decimal numbers :

(a) 1101_2

(b) $1011\ 11_2$

(c) 1111_2

2. Express the decimal 5280 in Excess-3 code.

3. List three digital logic families.

4. Realize half-adder circuit using NAND gates only.

5. State the need for a tri-state buffer.

6. List the types of register.

7. Draw a level clocked T flip-flop.
8. What is the need of preset and clear inputs in flip-flops?
9. Define the terms resolution and accuracy of D/A converter.
10. Compare static RAM with dynamic RAM.

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) State any five Boolean postulates. 5
(b) Draw the logic circuits for the realization of AND, OR and NOT operations using NOR gates only. 5
12. (a) Write Boolean expression of product of maxterms from the following truth table : 5

| Inputs | | | Output |
|--------|---|---|--------|
| A | B | C | X |
| 0 | 0 | 0 | 0 |
| 0 | 0 | 1 | 1 |
| 0 | 1 | 0 | 0 |
| 0 | 1 | 1 | 1 |
| 1 | 0 | 0 | 1 |
| 1 | 0 | 1 | 0 |
| 1 | 1 | 0 | 1 |
| 1 | 1 | 1 | 0 |

- (b) Use Karnaugh map to simplify the following Boolean expression : 5

$$Y = \bar{A}\bar{B} + \bar{A}B + AB$$

13. Draw and ^{*}explain the logic circuit of 4 to 1 multiplexer.
14. Draw a 2's compliment parallel adder/subtractor circuit and explain its working.
15. Draw and explain the working of ring counter.
16. (a) Draw and explain the operation of NOR latch. 5
(b) What is the necessity of clock in flip-flop? List the types of triggering. 5
17. (a) Write a short note on memory modules used in computers. 5
(b) Distinguish between EEPROM and UMPROM. 5
18. Explain D/A conversion using R-2R ladder network with a circuit diagram.
