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C09–EC–305

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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

$$Y \quad \overline{A}\,\overline{B} \quad A\overline{B} \quad AB$$

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.

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