C14–EC–**305**

4241

BOARD DIPLOMA EXAMINATION, (C–14)
OCT/NOV—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 numbers :

    (a) $(FE7)_{16}$　$(\ )_{10}$

    (b) $(753)_{10}$　$(\ )_{8}$

2. Compare weighted and unweighted codes.

3. Develop AND and NOT gates using NAND gates only.

4. List any three IC numbers of two-input digital logic gates.

5. Develop half-adder using NAND gates.

6. Draw logic circuit digital comparator.

7. State the necessity of clock.

8. What is race around condition? How can it be avoided?

9. List any three applications for *(a)* flip-flops and *(b)* registers.

10. Write any three differences betweeen static RAM and dynamic RAM.

<div align="center">PART—B</div> <div align="right">10×5=50</div>

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)* Perform subtraction of a given binary number using 1's complement method : 3+3=6

 (i) 1110-1001

 (ii) 0101-1101

(b) State any four postulates in Boolean algebra. 4

12. *(a)* State and prove De Morgan theorems. 5

(b) Write Boolean expression of sum of min terms from the following truth table and simplify : 5

Input			Output
A	*B*	*C*	*Y*
0	0	0	0
0	0	1	1
0	1	0	1
0	1	1	0
1	0	0	0
1	0	1	1
1	1	0	1
1	1	1	0

13. *(a)* Define propagation delay and noise margin.   4

    (b) Draw and explain the working of TTL NAND gate with open collector output with circuit.   6

14. *(a)* Explain the working of 'serial adder' with a block diagram.   5

    (b) Draw and explain the operation '4 1 MUX'.   5

15. *(a)* Explain the working of decimal to BCD encoder circuit.   7

    (b) State the need for a tristate buffer.   3

16. Explain the operation of 'master-slave *J-K* flip-flop' with neat sketch.

17. Draw and explain the working of 4-bit bidirectional sift register with timing diagram.

18. *(a)* Distinguish between synchronous and asynchronous counters.   4

    (b) Explain the working of basic dynamic MOS RAM cell.   6

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