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C16–EC–303

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BOARD DIPLOMA EXAMINATION, (C–16)

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 into decimal :

(a) $(101000)_2$

(b) $(2B8)_{16}$

(c) $(743)_8$

2. Subtract $(111001)_2$ from $(101011)_2$ using 2's complement method.

3. Express the decimal number 4953 using Excess-3 code.

4. List the important characteristics of logic families.

5. Compare the performance of serial and parallel adder.

6. Draw the logic circuit of 1 × 4 demultiplexer.

7. Differentiate between level clocking and edge triggering.

8. List the applications of flip-flops.

9. Distinguish between synchronous and asynchronous counters.

10. Classify registers based on data I/O.

PART—B

5×10=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. Draw the logic circuits for the realization of AND, OR and NOt operations using NAND gates only using NOR gates only.

12. *(a)* Simplify the Boolean expression

$$Y(A, B, C) \quad m(0, 4, 5, 6, 7)$$

using k-map. 5

(b) Explain the working of exclusive OR gates with truth table. 5

13. Explain the working of CMOS NAND gate with circuit diagram. 5+5=10

14. Draw and explain the working of 4-bit parallel adder circuit using full adders.

15. *(a)* Draw and explain decimal to BCD encoder. 7

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

16. Explain the operation of master-slave JK flip flop with neat sketch.

17. Draw and explain the working of asynchronous 3 bit up-down counter. 5+5=10

18. Explain the working of diode ROM with neat sketch. 5+5=10

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