C16-EC–303

6234

BOARD DIPLOMA EXAMINATION, (C-16)

AUGUST/SEPTEMBER—2021

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 $(110101.100)_2$ into decimal, octal and hexadecimal numbers.

2. Compare weighted and unweighted codes.

3. State De-Morgan's theorems.

4. Define the terms propagation delay and noise margin of digital ICs.

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

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

7. Draw the symbols of edge triggered D and T flip-flops.

8. Distinguish between synchronous and asynchronous counters.

9. Draw the circuit of 4-bit ring counter.

10. Compare static RAM and dynamic RAM.

PART—B

Instructions : (1) Answer *any* **five** questions.

(2) Each question carries **ten** marks.

(3) Answers should be comprehensive and criterion for valuation is the content but not the length of the answer.

11. Explain the working of Universal logic gates (NAND, NOR gates) with truth tables. 10

12. *(a)* Simplify the Boolean expression $Y(\bar{A},\bar{B},\bar{C}) = \bar{A}BC + A\bar{B}C + AB\bar{C} + ABC$ using K-map. 6

(b) Write the gray code for binary number 11010101. 4

13. Draw and explain the working of TTL NAND gate with totem pole output. 5+5

14. Draw and explain the logic circuit of 4×1 multiplexer. 5+5

15. Explain the operation of full-adder circuit with truth table using basic gates. 10

16. *(a)* Explain the working of level clocked J-K flip-flop with circuit diagram and truth table. 7

(b) What is race around condition? 3

17. Draw and explain the working of asynchronous decade counter with timing diagram. 10

18. Draw and explain the working of 4-bit shift left register with timing diagram. 10

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