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Reg. No. :

Code No. : 20493 E

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B.Sc. (CBCS) DEGREE EXAMINATION,
NOVEMBER 2023.

Third Semester

Computer Science

Skill Based Subject — DIGITAL DESIGN

(For those who joined in July 2021-2022)

Time : Three hours

Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. What is the decimal equivalent of 0.1101_2 ?
(a) 0.78125 (b) 0.8125
(c) 0.9375 (d) 0.6875
2. Which code is used in IBM make devices?
(a) BCD (b) GRAY code
(c) ASC II (d) EBCDIC

3. $AB + \bar{A}C + BC = \text{—————}$

- (a) $(A + B)(\bar{A} + C)$ (b) $AB + \bar{A}C$
(c) $AB + BC$ (d) $\bar{A}C + BC$

4. How many fundamental products are there for three variables?

- (a) 2 (b) 3
(c) 4 (d) 8

5. $A \oplus B = \text{—————}$

- (a) $A + B$ (b) $AB + \bar{A}\bar{B}$
(c) $\bar{A}\bar{B} + \bar{A}B$ (d) $\bar{A} + \bar{B}$

6. 2's complement of -48_{10} is —————

- (a) 11010000 (b) 10110000
(c) 01010000 (d) 01001111

7. Which of the following serve as key memory elements?

- (a) Switches (b) Relays
(c) Flip flops (d) Quartz crystals



8. If the output responds immediately to input signals, then the flip flop is _____

- (a) transparent
- (b) positive edge triggered
- (c) negative edge triggered
- (d) neutral

9. Which of the following flip flop is not used to construct registers?

- (a) RS
- (b) D
- (c) JK
- (d) T

10. Which of the following is used to store a binary number?

- (a) Array
- (b) Register
- (c) Cell
- (d) Counter

PART B — (5 × 5 = 25 marks)

Answer ALL questions, choosing either (a) or (b).
Each answer should not exceed 250 words.

11. (a) (i) Convert the binary 110.001 to a decimal number.
(ii) A computer has 2 MB memory. What is the decimal equivalent of 2 MB?

Or

- (b) Write a note on ASCII.

12. (a) Write the consensus theorem.

Or

- (b) What is the simplified Boolean equation for the following logic equation?

$$F(A, B, C, D) = \sum m(7, 9, 10, 11, 12, 13, 14, 15)$$

13. (a) Write a note on multiplexer.

Or

- (b) Perform binary addition $(83)_{10}$ and $(-16)_{10}$.

14. (a) Write a note on flip flops.

Or

- (b) Write a note on edge triggered D flip flop.

15. (a) Explain serial in serial out register.

Or

- (b) Explain parallel in parallel out register.



PART C — (5 × 8 = 40 marks)

Answer ALL questions, choosing either (a) or (b)
Each answer should not exceed 600 words.

16. (a) Tabulate the BCD representation and excess – 3 code for decimal 0 – 9.

Or

- (b) Explain the universal logic gates.

17. (a) Construct the truth table for
(i) three input NOR gate
(ii) three input AND gate.

Or

- (b) Write the SOP and POS using Karnaugh map.

$$F(A, B, C, D) = \prod M(0, 1, 2, 4, 5, 14) + \prod d(8, 9, 11, 12, 13, 15)$$

18. (a) Add $(-43)_{10}$ and $(-78)_{10}$ in binary form.

Or

- (b) Explain 7 segment decoder.

19. (a) Explain edge triggered RS flip flop.

Or

- (b) Explain JK master – slave flipflop.

20. (a) Explain serial in parallel out register.

Or

- (b) Explain universal shift register.

