Code No. : 20493 E   Sub. Code : CSCS 31

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. $AB + \overline{A} C + BC =$ _____
   (a) $(A + B)(\overline{A} + C)$ (b) $AB + \overline{A} C$
   (c) $AB + BC$ (d) $\overline{A} C + BC$

4. How many fundamental products are there for three variables?
   (a) 2   (b) 3
   (c) 4   (d) 8

5. $A \oplus B =$ _____
   (a) $A + B$ (b) $AB + \overline{A}\overline{B}$
   (c) $A\overline{B} + \overline{A}B$ (d) $\overline{A} + \overline{B}$

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?

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

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.

$$F(A, B, C, D) = \prod M(0, 1.2, 4, 5, 14) + d(8,9,11,12,13,15)$$

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.

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