(6 pages)

Reg. No. : ....

Code No. : 20416 E   Sub. Code : CSCS 31

B.Sc. (CBCS) DEGREE EXAMINATION,
NOVEMBER 2022.

Third Semester

Computer Science

Skill Based Subject — DIGITAL DESIGN

(For those who joined in July 2021 onwards)

Time : Three hours   Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. Convert the following decimal number 187 to 8-bit binary ——————

    (a) 10111011   (b) 11011101
    (c) 10111101   (d) 10111100

2. Which of the following are known as universal gates?

    (a) NAND and NOR   (b) AND and OR
    (c) XOR and OR   (d) None

3. A —————— is a group of two adjacent 1's.

    (a) Pair   (b) Quad
    (c) Octet   (d) None

4. —————— is used to analyze and simplify the digital (logic) circuits.

    (a) Shift register   (b) Counter
    (c) Boolean algebra   (d) None

5. —————— refers to a type of combinational circuit that accepts multiple inputs of data but provides only a single output.

    (a) De-multiplexer   (b) Multiplexer
    (c) Both (a) and (b)   (d) None

6. 2's complement of 101101 ——————

    (a) 100100   (b) 001000
    (c) 111111   (d) 010011

7. The —————— flip flop is basically a combination of two JK flip flops connected together in a series configuration.

    (a) Master slave   (b) D
    (c) T   (d) None

8. D flip flop is also called as ————— flip flop.

   (a) Delay
   (b) Master slave
   (c) Both (a) and (b)
   (d) None

9. SISO stands for —————

   (a) Shift in shift out
   (b) Parallel in serial out
   (c) Parallel in parallel out
   (d) Serial in serial out

10. A sequential device loads the data present on its inputs and then moves or 'shifts' it to its output once every clock cycle, hence the name —————

    (a) counter
    (b) shift register
    (c) both (a) and (b)
    (d) none

PART B — (5 × 5 = 25 marks)

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

11. (a) Give a brief note on octal and hexadecimal number system.

    Or

    (b) Describe the usage of excess-3 code.

12. (a) Define the terms : pairs, quads and octets in K-map.

    Or

    (b) Tabulate the postulates and theorems of Boolean algebra.

13. (a) What do you mean by sign magnitude numbers?

    Or

    (b) Define the terms encoder and decoder.

14. (a) Draw the logic diagram and characteristics table for edge triggered JK master slave flip flops.

    Or

    (b) Define flip flop. What is edge triggered D flip flop?

15. (a) What is universal shift register?

    Or

    (b) Write short note on Serial In and Parallel Out shift register.

PART C — (5 × 8 = 40 marks)

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

16. (a) Convert the binary numbers 1001, 1101, 101010, 11111, 10111 into its decimal numbers.

Or

(b) Tabulate the different types of logic gates with its logic diagram and truth table.

17. (a) Simplify the expression : $F(a,b,c) = \Sigma(1,3,4,5)$ using both sum of products and product of sum in a K-map. Compare the results.

Or

(b) Simplify the Boolean function ;

$F = A'B'C' + B'CD' + A'BCD' + AB'C'$.

18. (a) How to do binary subtraction with r's compliments? Explain with an example.

Or

(b) What is demultiplexer? Give a brief note on BCD to decimal decoder.

19. (a) Discuss in detail about edge triggered RS flip flop.

Or

(b) With neat logic diagram and characteristic table explain edge triggered JK flip flop.

20. (a) Illustrate serial in and serial out shift register.

Or

(b) With neat diagram, describe parallel in and parallel out shift register.

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