(6 pages)

Reg. No. : .....

Code No. : 20423 E **Sub. Code : CACA 11**

B.C.A. (CBCS) DEGREE EXAMINATION, NOVEMBER 2022.

First Semester

Computer Application – Allied

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. Octal number system has ———— symbols.
   (a) 15 (b) 16
   (c) 8 (d) 10

2. The binary system, 1+1=
   (a) 2 (b) 0
   (c) 1 (d) 5

3. Subtract $(1010)_2$ from $(1101)_2$ using 1st complement.
   (a) $(1100)_2$ (b) $(0011)_2$
   (c) $(1001)_2$ (d) $(0101)_2$

4. Full adder is constructed by using ————
   (a) Two Half Adder and one OR gate
   (b) Two OR gate and one HA
   (c) One HA and two OR gate
   (d) One OR gate and one HA

5. Half adder is logic CKT that adds ———— Digit at a time.
   (a) Two (b) One
   (c) Three (d) Zero

6. Multiplexers is also known as ————
   (a) Mux (b) Demux
   (c) Adder (d) Substrator

7. Karnaugh map (K-map) technique provides a systematic method for simplifying ————
   (a) Multiplexers (b) Demultiplexers
   (c) Boolean expressions (d) Logic gates

8. Each Flip-flop stores ————
   (a) 1 bit (b) 8 bits
   (c) 16 bits (d) 2 bits

9. In Boolean algebra, A+ A= ————
   (a) A (b) 1
   (c) 0 (d) 3

10. Which of the following registers is used to keep track of address of the memory location where the next instruction is located?
    (a) Memory Address Register
    (b) Memory Data Register
    (c) Instruction Register
    (d) Program Register

PART B — (5 × 5 = 25 marks)

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

11. (a) State the associative property of Boolean algebra.

Or

(b) Convert binary number 11011110 into its decimal equivalent.

12. (a) Distinguish between the canonical and standard forms.

Or

(b) What are the limitations of Karnaugh map? Explain.

13. (a) Explain the combinational circuits with diagram.

Or

(b) Point out the functions of magnitude comparator.

14. (a) Write the truth table of a 4:1 multiplexer.

Or

(b) Analysis the need of storage element latches.

15. (a) Summarize the functions of ripple counters.

Or

(b) Differentiate between the RAM and ROM.

PART C — (5 × 8 = 40 marks)

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

16. (a) Determine the binary numbers for the following hexadecimal numbers:

(i) 10A4

(ii) CF8E

(iii) 9742

Or

(b) Outline the purpose of binary storage and registers.

17. (a) What are digital logic gates? Explain.

Or

(b) Examine the product of sums simplification with example.

18. (a) Illustrate the implementation of binary adder-subtractor.

Or

(b) Draw and explain the concept of binary multiplier.

19. (a) Compare the functions of decoders and encoders.

Or

(b) Analysis the functions of clocked sequential circuits.

20. (a) Discuss the error detection and correction with diagram.

Or

(b) Elaborate the different types of shift registers.

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