

(6 pages)

Reg. No. :

Code No. : 40546 E Sub. Code : JACA 11/
SACA 11

B.C.A. (CBCS) DEGREE EXAMINATION,
NOVEMBER 2019.

First Semester

Computer Application — Allied

DIGITAL DESIGN

(For those who joined in July 2016 onwards)

Time : Three hours

Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. A Boolean function may be transformed into
 - (a) logical diagram
 - (b) logical graph
 - (c) map
 - (d) matrix

2. A binary variable can take values
 - (a) 0 only
 - (b) 0 and -1
 - (c) 0 and 1
 - (d) 1 and 2
3. Two variables will be represented by
 - (a) eight minterms
 - (b) six minterms
 - (c) five minterms
 - (d) four minterms
4. Adjacent squares represents a
 - (a) circle
 - (b) variable
 - (c) literal
 - (d) minterm
5. One that is a universal gate
 - (a) AND
 - (b) NAND
 - (c) OR
 - (d) NOT
6. Four gates in a package is called
 - (a) biruple
 - (b) octuple
 - (c) dualruple
 - (d) quadruple
7. Output sum of two decimal digits can be represented in
 - (a) Gray code
 - (b) Excess-3
 - (c) BCD
 - (d) Hexadecimal

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8. Addition of two decimal digits in BCD can be done through

- (a) BCD adder
- (b) Full adder
- (c) Ripple carry adder
- (d) Carry look ahead

9. Flip-flops can be constructed with two

- (a) NAND gates (b) OR gates
- (c) AND gates (d) NOT gates

10. RS flip-flops are also called

- (a) RS latch (b) SR latch
- (c) TS latch (d) ST latch

PART B — (5 × 5 = 25 marks)

Answer ALL questions, choosing either (a) or (b).

Each answer should not exceed 250 words.

11. (a) Define Boolean algebra based on huntington postulates.

Or

(b) Describe complement of a function with atleast two examples.

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12. (a) Discuss the five variables map and their impact on number of literals in the term.

Or

(b) Simplify the boolean functions in

- (i) sum of products
- (ii) product of sums

$$F(A, B, C, D) = \sum(0, 1, 2, 5, 8, 9, 10).$$

13. (a) Describe Full-Adder with its truth table and maps.

Or

(b) With a block diagram explain BCD Adder.

14. (a) Discuss and compare SR latch and D latch.

Or

(b) Analyze the clocked sequential circuit with JK flipflop.

15. (a) Describe the functions of Ring counter as a circular shift register.

Or

(b) Distinguish between single error correction and double error correction.

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PART C — ($5 \times 8 = 40$ marks)

Answer ALL questions, choosing either (a) or (b).

Each answer should not exceed 600 words.

16. (a) (i) Compare BCD codes and Gray codes
(ii) Subtract with 10's complement.
(1) 98342-1271
(2) 3412-10525 and describe the steps involved in detail.

Or

- (b) With respect to digital systems explain the signed binary numbers in detail.
17. (a) (i) Discuss the uses of positive and negative logic polarities in gates.
(ii) Explain the evolution of integrated circuits in three stages.

Or

- (b) Describe the role of digital logic gates in boolean functions with extension to multiple inputs.

18. (a) (i) Explain 2-bit by 2-bit binary multiplier with suitable illustration.
(ii) Explain "NOR operation is the dual of NAND operation".

Or

- (b) Implementing Exclusive -OR in odd functions and parity generation and error checking.
19. (a) Distinguish between flipflop analysis and JK flipflop analysis.

Or

- (b) Elaborate the working of decoders in discrete information representation.
20. (a) Describe the ROM, their types and PLDs with suitable examples.

Or

- (b) (i) Analyze the working of shift register in passing binary information.
(ii) Describe the characteristics of universal shift register.

