

(6 pages)

Reg. No. :

Code No. : 21197

Sub. Code : JACA 11/
SACA 11

B.C.A. (CBCS) DEGREE EXAMINATION,
NOVEMBER 2017.

First Semester

Computer Application — Allied

DIGITAL DESIGN

(For those who joined in July 2016 and afterwards)

Time : Three hours

Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. Hexa digital number 'F' is equal to ———.

- (a) 11_{10} (b) 12_{10}
(c) 15_{10} (d) 16_{10}

2. $x + ny = x$ is a ——— theorem.

- (a) Demorgan (b) Absorption
(c) Associative (d) Distributive

3. Which of the following gives minterm combinations?

- (a) AND
(b) OR
(c) Both (a) and (b)
(d) None of these

4. The k-map is used for ——— Boolean function.

- (a) Maximizing
(b) Minimizing
(c) Deriving
(d) All the above

5. Which of the following represent exclusive NOR gates?

- (a) $x \oplus y$ (b) $(x \oplus y)'$
(c) $(x \odot y)'$ (d) None of these

6. In half adder, there are ——— binary inputs and ——— binary outputs.

- (a) 2, 2 (b) 2, 3
(c) 3, 3 (d) 0, 0

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7. If a decoder circuits has m inputs, then it gives _____ output lines.

- (a) 2^m (b) 2^{m-1}
(c) 2^{m+1} (d) 2^{m-2}

8. The characteristics equation of the D-Flip-Flop is _____.

- (a) $Q = D$
(b) $Q = 1$
(c) $Q = 0$
(d) None of these

9. A binary ripple counter consists of connection of _____.

- (a) Adder
(b) Decoder
(c) Flip Flop
(d) None of these

10. ROM can perform only the _____ operation.

- (a) Write
(b) Read
(c) Both (a) and (b)
(d) All of the above

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PART B — (5 × 5 = 25 marks)

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

Answer should not exceed 250 words.

11. (a) Obtain the 1's and 2's complements of the following binary numbers :

- (i) 11101010
(ii) 01111110.

Or

(b) Simplify the following boolean function
 $xy + x'y + yz$.

12. (a) Convert the following expression into sum of products and product of sums
 $(AB + C)(B + C'D)$.

Or

(b) Explain the following gates with neat diagram
(i) AND (ii) OR (iii) NOT.

13. (a) Design and explain binary subtractor.

Or

(b) Draw a NAND logic diagram and explain.

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[P.T.O.]



14. (a) Explain in detail about Exclusive-OR function.

Or

- (b) Define and explain characteristic tables for Flip Flop.

15. (a) Explain BCD counter with diagram.

Or

- (b) What is the meaning of shift registers? Explain.

PART C — (5 × 8 = 40 marks)

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

Each answer should not exceed 600 words.

16. (a) Add and multiply the following numbers without converting them to decimal

- (i) Binary numbers 1011 and 101.
- (ii) Hexadecimal numbers 2E and 34.

Or

- (b) Explain the following :

- (i) Hexadecimal number.
- (ii) Boolean algebra.

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17. (a) Simplify the following function F , together with don't care conditions d .

$$F(x, y, z) = \sum(0, 1, 2, 4, 5)$$

$$d(x, y, z) = \sum(3, 6, 7).$$

Or

- (b) Simplify the following Boolean functions, using three-variable maps :

(i) $F(x, y, z) = \sum(0, 1, 5, 7)$

(ii) $F(x, y, z) = \sum(1, 2, 3, 6, 7).$

18. (a) Explain full adder circuit with neat diagram.

Or

- (b) Explain in detail about binary multiplier.

19. (a) What is Flip-Flop? Explain JK flip-flop with neat diagram.

Or

- (b) What is the use of multipliers? Explain in detail about 2-to-1 line multiplier.

20. (a) What is the use of Registers? Explain ripple counters.

Or

- (b) Explain the following :

(i) Types of ROM.

(ii) Memory decoding.

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