

BCA-02

December - Examination 2019

BCA Pt. I Examination**Discrete Mathematics****Paper - BCA-02****Time : 3 Hours]****[Max. Marks :- 70**

Note: The question paper is divided into three sections A, B and C. Write answers as per given instructions.

Section - A **$7 \times 2 = 14$** **(Very Short Answer Questions)**

Note: Answer **all** questions. As per the nature of the question delimit your answer in one word, one sentence or maximum upto 30 words. Each question carries 2 marks.

1. i. What is the full form of EBCDIC?.
- ii. Write absorption Law for Boolean Algebra? Give an example.
- iii. What is the objective function? Give an example.
- iv. If $a' + b = 1$ then, what is value of ab' ?
- v. What do you mean by the duality of function? Give an example.
- vi. What do you mean by the cardinality of a set? Give an example.
- vii. Draw an exclusive OR gate (XOR gate).

Section - B **$4 \times 7 = 28$** **(Short Answer Questions)**

Note: Answer **any four** questions. Each answer should not exceed 200 words. Each question carries 7 marks.

2. Solve:

a. $(2456)_8 = (?)_{10}$

b. $(988)_{10} = (?)_2$

c. $(5A6)_{16} = (?)_2$

d. $(10010011)_2 = (?)_{16}$

3. Construct truth table of $(p \vee q) \wedge (\sim q \vee r)$.

4. State and prove De-Morgan theorem.

5. Explain the Floating Point representation with a suitable example.

6. If in a group each element is inverse of itself then prove that a group is an Abelian group.

7. Simplify the three variable Boolean expression $\prod(1, 2, 4, 7)$ using Boolean algebra.

8. If R is Relation $N \times N$ defined $(a, b) R (c, d) \Rightarrow ab = bc \forall (a, b)$ and $(c, d) \in N \times N$ then prove that R is equivalence relation.

9. Prove that set $G = \{1, \omega, \omega^2\}$ is cyclic group for multiplication of complex number where $1, \omega, \omega^2$ is the cube root of unity.

Section - C**2 × 14 = 28****(Long Answer Questions)**

Note: Answer **any two** questions. You have to delimit your each answer maximum upto 500 words. Each question carries 14 marks.

10. Draw the logic circuit for Boolean expression :
 $E(x,y,z) = (x+y)(y+z)(z+x)$ using only NOR gate.
11. What is the relation in Set Theory? Mention the types of relation with examples.
12. Explain the following computer codes
 - i. UNICODE
 - ii. BCD
 - iii. ASCII
 - iv. Excess-3.
13. Prove that the following propositions are tautology or fallacies:
 - a. $(p \wedge q) \rightarrow (p \vee q)$.
 - b. $(p \vee q) \wedge (\sim p \wedge \sim q)$.
