

D 73252

(Pages : 2)

Name.....

Reg. No.....

**FIRST SEMESTER B.A./B.Sc. DEGREE EXAMINATION  
NOVEMBER 2019**

(CBCSS—UG)

BCA

BCA 1C 02—DISCRETE MATHEMATICS

(2019 Admissions)

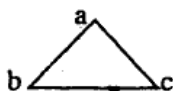
Time : Two Hours

Maximum : 60 Marks

**Section A (Short Answer Type Questions)**

*Answer all questions, each correct answer carries a maximum of 2 marks. Ceiling 20 marks.*

1. Symbolize the statement "All men are giants".
2. Draw the truth table of biconditional statement .
3. Give an example of a relation which is both symmetric and antisymmetric.
4. Define greatest lower bound in Poset.
5. Write the least upperbound and gratest lower bound of the set  $\{3, 5\}$  in the poset  $\langle Z - \{0\}, \leq \rangle$  where  $\leq$  is the divides relation.
6. Is the relation  $R = \{ \langle x, y \rangle / x \geq y \}$  antisymmetric ? Justify.
7. Define a Hamiltonian Graph.
8. Briefly explain spanning tree.
9. What is mean by chromatic number of a graph ?
10. Define cut vertices and cut edge.
11. Write the matrix representation of the graph.



12. Write the definition of incidence matrix.

Turn over

### Section B (Short Essay Type Questions)

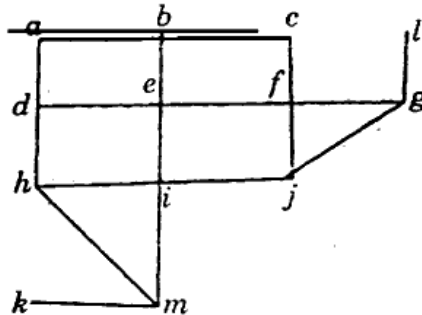
Answer all questions, each correct answer carries a maximum of 5 marks.  
Ceiling 30 marks.

13. Show that for any two sets A and B,  $A - (A \cap B) = A - B$ .
14. Explain set operations with Venn diagram.
15. Write the Boolean expression  $x_1 \oplus x_2$  in an equivalent sum of products canonical form in three variables  $x_1, x_2, x_3$ .
16. Is the "divides" relation a partial ordering on the set of non zero integers? Explain.
17. Define complete graph. Show that a complete graph with n nodes has the maximum number of edges  $n(n-1)/2$ .
18. Define planar graphs. Is  $K_{3,3}$  a planer graph? Justify.
19. Explain Depth-first search Algorithm for spanning tree.

### Section C (Essay Type Questions)

Answer any one question, correct answer carries 10 marks.

20. Show that  $\langle B, *, \oplus, '0,1 \rangle$  is a Boolean Algebra. Also explain the properties.
21. Draw the breadth first search spanning tree of the following graph. Explain the algorithm with this example.



(1 × 10 = 10 marks)