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Total No. of Pages : 02

Total No. of Questions : 18

B.Tech.(CSE/IT) (Sem.-3)
DISCRETE STRUCTURES
Subject Code : BTCS-302
Paper ID : [A1124]

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. **SECTION-A** is **COMPULSORY** consisting of **TEN** questions carrying **TWO** marks each.
2. **SECTION-B** contains **FIVE** questions carrying **FIVE** marks each and students have to attempt any **FOUR** questions.
3. **SECTION-C** contains **THREE** questions carrying **TEN** marks each and students have to attempt any **TWO** questions.

SECTION-A**Answer briefly :**

1. How many subset can be formed from a set of n elements? How many of these will be proper?
2. Give an example of a relation which is both symmetric and antisymmetric.
3. How many words can be obtained by arranging the letter of the word 'DISCRETE'? In how many of them D, I, S occur together?
4. List all the elements and draw Hasse diagram of D_{36} .
5. Define Ideal of a Ring and Quotient Ring.
6. Give an example of finite abelian group.
7. State Lagrange's Theorem. Is its converse true?
8. Show that identity element of a group is unique.
9. Define bipartite graph with example.
10. Differentiate between path and circuit.

SECTION-B

11. Use Karnaugh map to find the minimal sum for $f(x, y, z, t) = xy' + xyz + x'y'z' + x'yz't'$.
12. Show that $X = \{0, 1, 2, 3, 4, 5\}$ is a commutative ring with unity under addition and multiplication modulo 6.
13. Is the relation of perpendicularity between two lines is an equivalence relation, Justify.
14. Show that $K_{3,3}$ is not a planer graph.
15. Prove that every subgroup of Cyclic group is cyclic.

SECTION-C

16. Solve recurrence relation $S(K+2) - 5S(K+1) + 6S(K) = 5^K$.
17. Show that set of even integer is a commutative ring without unity.
18. State and prove Eulerian theorem on graph to show that Koinigsberg's graph is not proved to a solution.