

Roll No.

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Total No. of Pages : 02

Total No. of Questions : 18

B.Tech.(Computer Science & Engineering)

(Sem.-3)

DISCRETE STRUCTURES

Subject Code : BTCS-302

M.Code : 56592

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. Define Partial order relations.
2. Define Hashing Functions.
3. Define Sub-Ring.
4. Define Euclidean Domain.
5. In how many ways can an 8 people be seated in a round table?
6. Define Semi-Group.
7. Define Monoids.
8. Define Dihedral Groups.
9. Define un-directed graph.
10. Define Chromatic number.

SECTION-B

11. Let R be the relation on the set $\{0,1,2,3\}$ containing the ordered pairs $(0,1)$, $(1,1)$, $(1,2)$, $(2,0)$, $(2,2)$, and $(3,0)$. What is the reflexive closure, symmetric closure and transitive closure of R ?
12. Find the field of quotients of the integral domain $Z(\sqrt{2})$.
13. Solve: $T(k) - 8T(K-1) + 16T(K-2) = 0$.
14. Let G be a finite group and let $a \in G$ be an element of order n . Then show that $a^m = e$ if n is a divisor of m .
15. State and prove Euler Formula.

SECTION-C

16. Prove that any finite semi-group is a group iff both the cancellation laws hold.
17. If I and J be any two ideals of a ring R , then prove that IJ is an ideal of R . Moreover $IJ \subseteq I \cap J$.
18. A finite connected graph is Eulerian iff each vertex has even degree.

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.