Program: COMPUTER Engineering
Curriculum Scheme: Rev2019
Examination: Second Year Semester III
Course Code: E401 and Course Name: DSGT

Time: 1 hour                                                                                   Max. Marks: 50

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For the students: - All the Questions are compulsory and carry equal marks.

| Q1. | Let a set S = {2, 4, 8, 16, 32} and <= be the partial order defined by S <= R if a divides b. Number of edges in the Hasse diagram of is _____ |
|---|---|
| Option A: | 6 |
| Option B: | 5 |
| Option C: | 9 |
| Option D: | 4 |
| | |
| Q2. | A function defined by f(x)=2x such that f(x+y)=2x+y under the group of real numbers, then _____ |
| Option A: | Isomorphism exists |
| Option B: | Heteromorphic exists |
| Option C: | Association exists |
| Option D: | None of the above |
| | |
| Q3. | If x * y = x + y + xy then (G, *) is _____ |
| Option A: | Monoid |
| Option B: | Abelian group |
| Option C: | Commutative semigroup |
| Option D: | Cyclic group |
| | |
| Q4. | If each and every vertex in G has degree at most 23 then G can have a vertex coloring of |
| Option A: | 24 |
| Option B: | 23 |
| Option C: | 176 |
| Option D: | 54 |
| | |
| Q5. | The number of edges in a regular graph of degree 46 and 8 vertices is _____ |
| Option A: | 347 |
| Option B: | 230 |
| Option C: | 184 |
| Option D: | 186 |
| | |
| Q6. | A function is defined by f(x)=2x and f(x + y) = f(x) + f(y) is called |
| Option A: | isomorphic |
| Option B: | homomorphic |
| Option C: | cyclic group |
| Option D: | heteromorphic |
| | |

| Q7. | Every Isomorphic graph must have _____ representation. |
| --- | --- |
| Option A: | cyclic |
| Option B: | adjacency list |
| Option C: | tree |
| Option D: | adjacency matrix |
| | |
| Q8. | Every poset that is a complete semilattice must always be a _____ |
| Option A: | sublattice |
| Option B: | complete lattice |
| Option C: | free lattice |
| Option D: | partial lattice |
| | |
| Q9. | In a group there must be only _____ element. |
| Option A: | 1 |
| Option B: | 2 |
| Option C: | 4 |
| Option D: | 5 |
| | |
| Q10. | If the sum of elements in each row of an n×n matrix Z is zero, then the matrix is _____ |
| Option A: | inverse |
| Option B: | non-singular |
| Option C: | additive inverse |
| Option D: | singular |
| | |
| Q11. | The graph representing universal relation is called _____ |
| Option A: | complete digraph |
| Option B: | partial digraph |
| Option C: | empty graph |
| Option D: | partial subgraph |
| | |
| Q12. | Degree of a graph with 12 vertices is _____ |
| Option A: | 24 |
| Option B: | 18 |
| Option C: | 144 |
| Option D: | 64 |
| | |
| Q13. | An undirected graph has 8 vertices labelled 1, 2, …,8 and 31 edges. Vertices 1, 3, 5, 7 have degree 8 and vertices 2, 4, 6, 8 have degree 7. What is the degree of vertex 8? |
| Option A: | 8 |
| Option B: | 5 |
| Option C: | 15 |
| Option D: | 23 |
| | |
| Q14. | Determine the number of integers between 1 to 250 that are divisible by 2 or 3 or 5 or 7. |
| Option A: | 191 |

| | |
|---|---|
| Option B: | 192 |
| Option C: | 193 |
| Option D: | 190 |
| | |
| Q15. | Let R be a Relation on Z Which is defined by as x R y, iff 2x+3y, is divisible by 5 is an equivalence relation |
| Option A: | Yes |
| Option B: | No |
| Option C: | Only Transitive |
| Option D: | Only Symmetric |
| | |
| Q16. | What is Circular Relation |
| Option A: | a R b and b R a |
| Option B: | a R b , b R c and c R a |
| Option C: | a R b , b R c and a R c |
| Option D: | None of the above |
| | |
| Q17. | Which Statement is True for Injective |
| Option A: | f(x1)=f(x2) |
| Option B: | f(x1)>f(x2) |
| Option C: | f(x2)>f(x1) |
| Option D: | None of the above |
| | |
| Q18. | Which One is true For Pigeonhole Principle |
| Option A: | m<n |
| Option B: | m>n |
| Option C: | n=m |
| Option D: | None of the above |
| | |
| Q19. | In Partial Order Relation Which One is True |
| Option A: | Reflexive, Symmetric and Transitive |
| Option B: | Reflexive Symmetric Only |
| Option C: | Reflexive, Anti-Symmetric and Transitive |
| Option D: | None of the above |
| | |
| Q20. | Let (A7, $\otimes$7)=({1, 2, 3, 4, 5, 6}, $\otimes$7) is a group. It has two sub groups X and Y. X={1, 3, 6}, Y={2, 3, 5}. What is the order of union of subgroups? |
| Option A: | 65 |
| Option B: | 5 |
| Option C: | 32 |
| Option D: | 18 |
| | |
| Q21. | .If (M, *) is a cyclic group of order 73, then number of generator of G is equal to _____ |
| Option A: | 89 |
| Option B: | 23 |
| Option C: | 72 |
| Option D: | 17 |

| | |
|---|---|
| **Q22.** | The set of even natural numbers, {6, 8, 10, 12,..,} is closed under addition operation. Which of the following properties will it satisfy? |
| Option A: | closure property |
| Option B: | associative property |
| Option C: | symmetric property |
| Option D: | identity property |
| | |
| **Q23.** | Every cyclic group is a/an _____ |
| Option A: | infinite subgroup |
| Option B: | abelian group |
| Option C: | monoid |
| Option D: | commutative semigroup |
| | |
| **Q24.** | A _____ in a graph G is a circuit which consists of every vertex (except first/last vertex) of G exactly once. |
| Option A: | Euler path |
| Option B: | Hamiltonian path |
| Option C: | Planar graph |
| Option D: | Path complement graph |
| | |
| **Q25.** | A trail in a graph can be described as |
| Option A: | a walk without repeated edges |
| Option B: | a cycle with repeated edges |
| Option C: | a walk with repeated edges |
| Option D: | a line graph with one or more vertices |