University of Mumbai
Examination 2020

Program: COMPUTER Engineering

Curriculum Scheme: Rev2016/2012

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, ⊗7)=({1, 2, 3, 4, 5, 6}, ⊗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