

NADAR SARSWATHI COLLEGE OF ENGINEERING AND TECHNOLOGY, THENI.

Course/Branch : C301 /CSE	Year / Semester :II/III	Format No.	NAC/TLP-07a.13
Subject Code : MA835I	Subject Name : Discrete Mathematics	Rev. No.	02
Unit No :4	Unit Name : Algebraic Structures	Date	30.09.2020

OBJECTIVE TYPE QUESTION BANK

S. No.	Objective Questions (MCQ /True or False / Fill up with Choices)	BTL
1	A trivial subgroup consists of _____ a) Identity element b) Coset c) Inverse element d) Ring	L1
2	Minimum subgroup of a group is called _____ a) a commutative subgroup b) a lattice c) a trivial group d) a monoid	L1
3	Let K be a group with 8 elements. Let H be a subgroup of K and $H < K$. It is known that the size of H is at least 3. The size of H is _____ a) 8 b) 2 c) 3 d) 4	L2
4	_____ is not necessarily a property of a Group. a) Commutativity b) Existence of inverse for every element c) Existence of Identity d) Associativity	L1
5	A group of rational numbers is an example of _____ a) a subgroup of a group of integers b) a subgroup of a group of real numbers c) a subgroup of a group of irrational numbers d) a subgroup of a group of complex numbers	L2
6	Intersection of subgroups is a _____ a) group b) subgroup c) semigroup d) cyclic group	L2

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7	The group of matrices with determinant _____ is a subgroup of the group of invertible matrices under multiplication. a) 2 b) 3 c) 1 d) 4	L2
8	A normal subgroup is _____ a) a subgroup under multiplication by the elements of the group b) an invariant under closure by the elements of that group c) a monoid with same number of elements of the original group d) an invariant equipped with conjugation by the elements of original group	L2
9	Two groups are isomorphic if and only if _____ is existed between them. a) homomorphism b) endomorphism c) isomorphism d) association	L2
10	A non empty set A is termed as an algebraic structure _____ a) with respect to binary operation * b) with respect to ternary operation ? c) with respect to binary operation + d) with respect to unary operation -	L2
11	An algebraic structure _____ is called a semigroup. a) (P, *) b) (Q, +, *) c) (P, +) d) (+, *)	L2
12	Condition for monoid is _____ a) (a+e)=a b) (a*e)=(a+e) c) a=(a*(a+e)) d) (a*e)=(e*a)=a	L2
13	A monoid is called a group if _____ a) (a*a)=a=(a+c) b) (a*c)=(a+c) c) (a+c)=a	L2

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	d) $(a*c)=(c*a)=e$	
14	A group $(M,*)$ is said to be abelian if _____ a) $(x+y)=(y+x)$ b) $(x*y)=(y*x)$ c) $(x+y)=x$ d) $(y*x)=(x+y)$	L2
15	Matrix multiplication is a/an _____ property. a) Commutative b) Associative c) Additive d) Disjunctive	L1
16	A cyclic group can be generated by a/an _____ element. a) singular b) non-singular c) inverse d) multiplicative	L1
17	How many properties can be held by a group? a) 2 b) 3 c) 5 d) 4	L1
18	A cyclic group is always _____ a) abelian group b) monoid c) semigroup d) subgroup	L2
19	$\{1, i, -i, -1\}$ is _____ a) semigroup b) subgroup c) cyclic group d) abelian group	L2
20	A subgroup has the properties of _____ a) Closure, associative b) Commutative, associative, closure c) Inverse, identity, associative d) Closure, associative, Identity, Inverse	L1
21	If $a * b = a$ such that $a * (b * c) = a * b = a$ and $(a * b) * c = a * b = a$ then _____ a) * is associative b) * is commutative	L1

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	c) * is closure d) * is abelian	
22	The set of odd and even positive integers closed under multiplication is _____ a) a free semigroup of (M, \times) b) a subsemigroup of (M, \times) c) a semigroup of (M, \times) d) a subgroup of (M, \times)	L2
23	The set of rational numbers form an abelian group under _____ a) Association b) Closure c) Multiplication d) Addition	L2
24	Condition of semigroup homomorphism should be _____ a) $f(x * x) = f(x * y)$ b) $f(x) = f(y)$ c) $f(x) * f(y) = f(y)$ d) $f(x * y) = f(x) * f(y)$	L1
25	A function defined by $f(x)=2*x$ such that $f(x+y)=2x+y$ under the group of real numbers, then _____ a) Isomorphism exists b) Homomorphism exists c) Heteromorphic exists d) Association exists	L1
26	If $x * y = x + y + xy$ then $(G, *)$ is _____ a) Monoid b) Abelian group c) Commutative semigroup d) Cyclic group	L1
27	$a * H = H * a$ relation holds if _____ a) H is semigroup of an abelian group b) H is monoid of a group c) H is a cyclic group d) H is subgroup of an abelian group	L2
28	Lagrange's theorem specifies _____ a) the order of semigroup is finite b) the order of the subgroup divides the order of the finite group c) the order of an abelian group is infinite d) the order of the semigroup is added to the order of the group	L1
29	An isomorphism of a group onto itself is called _____ a) homomorphism b) heteromorphism c) epimorphism d) automorphism	L1

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30	How many different non-isomorphic Abelian groups of order 8 are there? a) 5 b) 4 c) 2 d) 3	L3
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