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1. 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 –
View Answer

Answer: a
Explanation: A non empty set A is called an algebraic structure w.r.t binary operation "*" if (a*b) belongs to S for all (a*b) belongs to S. Therefore "*" is closure operation on 'A'.

2. An algebraic structure ____ is called a semigroup.
a) (P, *)
b) (Q, +, *)
c) (P, +)
d) (+, *)
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Answer: a
Explanation: An algebraic structure (P,*) is called a semigroup if a*(b*c) = (a*b)*c for all a,b,c belongs to S or the elements follow associative property under "*". (Matrix,*) and (Set of integers,+) are examples of semigroup.

3. Condition for monoid is __________
a) (a+e)=a
b) (a*e)=(a+e)
c) a=(a*(a+e)
d) (a*e)=(e*a)=a
View Answer

Answer: d
Explanation: A Semigroup (S,*) is defined as a monoid if there exists an element e in S such that (a*e) = (e*a) = a for all a in S. This element is called identity element of S w.r.t *.

4. A monoid is called a group if _______
a) (a*a)=a=(a+c)
b) (a*c)=(a+c)
c) (a+c)=a
d) (a*c)=(c*a)=e
View Answer

Answer: d
Explanation: A monoid(B,*) is called Group if to each element there exists an element c such that (a*c)=(c*a)=e. Here e is called an identity element and c is defined as the inverse of the corresponding element.

5. 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)
View Answer

Answer: b
Explanation: A group (M,*) is said to be abelian if (x*y) = (x*y) for all x, y belongs to M. Thus Commutative property should hold in a group.

6. Matrix multiplication is a/an _____ property.
a) Commutative
b) Associative
c) Additive
d) Disjunctive
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Answer: b
Explanation: The set of two M*M non-singular matrices form a group under matrix multiplication operation. Since matrix multiplication is itself associative, it holds associative property.

7. A cyclic group can be generated by a/an ______ element.
a) singular
b) non-singular
c) inverse
d) multiplicative
View Answer

Answer: a
Explanation: A singular element can generate a cyclic group. Every element of a cyclic group is a power of some specific element which is known as a generator 'g'.

8. How many properties can be held by a group?
a) 2
b) 3
c) 5
d) 4
View Answer

Answer: c
Explanation: A group holds five properties simultaneously – a)Closure b) associative c) Commutative d) Identity element e) Inverse element.

9. A cyclic group is always __________
a) abelian group
b) monoid
c) semigroup
d) subgroup
View Answer

Answer: a
Explanation: A cyclic group is always an abelian group but every abelian group is not a cyclic group. For instance, the rational numbers under addition is an abelian group but is not a cyclic one.

10. {1, i, -i, -1} is _____
a) semigroup
b) subgroup
c) cyclic group
d) abelian group
View Answer

Answer: c
Explanation: The set of complex numbers {1, i, -i, -1} under multiplication operation is a cyclic group. Two generators i and -i will covers all the elements of this group. Hence, it is a cyclic group.