

D.K.M. COLLEGE FOR WOMEN (AUTONOMOUS)
APTITUDE TEST

11. Which of the following statements is false ?
- a) If R is reflexive, then $R \cap R^{-1} \neq \emptyset$ b) $R \cap R^{-1} \neq \emptyset \Rightarrow R$ is anti-symmetric.
- c) If R, R' are reflexive relations in A , then $R - R'$ is reflexive d) If R, R' are equivalence relations in a set A , then $R \cap R'$ is also an equivalence relation in A
12. $(\mathbb{Z}, *)$ is a group with $a*b = a+b+1 \forall a, b \in \mathbb{Z}$. The inverse of a is
- a) 0 b) -2
c) $a-2$ d) $-a-2$
13. Let G denote the set of all $n \times n$ non-singular matrices with rational numbers as entries. Then under multiplication G is a/an
- a) subgroup b) infinite, abelian
c) finite abelian group d) infinite, non abelian group
14. If $x^3 + y^3 = 9$ and $x + y = 3$, then the value of $x^4 + y^4$ is,
- a) 21 b) 0
c) 17 d) 25
15. If $b^2 + \frac{1}{b^2} = 1$, then value of $b^3 + \frac{1}{b^3}$ is ,
- a) 0 b) 6
c) -4 d) 4
16. If $x^{1/3} + y^{1/3} - z^{1/3} = 0$ then value of $(x + y - z)^3 + 27xyz$ is
- a) 8 b) 2
c) 0 d) 6
17. If $5^{\sqrt{x}} + 12^{\sqrt{x}} = 13^{\sqrt{x}}$ then value of x is,
- a) 2 b) 1
c) 3 d) 4
18. For any real number x the maximum value of $4 - 6x - x^2$ is at $x =$,
- a) 4 b) 6
c) -3 d) 3
19. if $x = (\sqrt{2} + 1)^{-1/5}$ then the value of $(x^5 - \frac{1}{x^5})$ is
- a) 0 b) -2
c) 2 d) 4
20. Let A be the set of all non-singular matrices over real numbers and let $*$ be the matrix multiplication operator. Then
- a) $\langle A, * \rangle$ is a monoid but not a group b) $\langle A, * \rangle$ is a group but not an abelian group
c) $\langle A, * \rangle$ is a semi group but not a monoid d) A is closed under $*$ but $\langle A, * \rangle$ is not a semi group
21. Let $(\mathbb{Z}, *)$ be an algebraic structure, where \mathbb{Z} is the set of integers and the operation $*$ is defined by $n * m = \text{maximum}(n, m)$. Which of the following statements is TRUE for $(\mathbb{Z}, *)$?
- a) $(\mathbb{Z}, *)$ is a group b) $(\mathbb{Z}, *)$ is a monoid
c) $(\mathbb{Z}, *)$ is an abelian group d) None of these
22. Some group $(G, 0)$ is known to be abelian. Then which one of the following is TRUE for G ?
- a) G is of finite order b) $g = g^2$ for every $g \in G$
c) $g = g^{-1}$ for every $g \in G$ d) $(g \circ h)^2 = g^2 \circ h^2$ for every $g, h \in G$
23. If the binary operation $*$ is defined on a set of ordered pairs of real numbers as $(a, b) * (c, d) = (ad + bc, bd)$ and is associative, then $(1, 2) * (3, 5) * (3, 4)$ equals
- a) $(7, 11)$ b) $(23, 11)$

