

PPSC LECTURER MATH (2017)

Available questions

1. A cyclic group of order n is generated by
(A) n elements (B) (n-1) elements (C) 1 element (D) None of these
2. Let G be a group of order 13.
(A) G is not cyclic (B) G is Non abelian (C) G is commutative (D) None of these
3. Identity element in a cyclic group is
(A) Infinite (B) Unique (C) Prime number (D) None of these
4. $\forall a, b \in G, (ab)^2 = a^2b^2$ then
(A) G is cyclic (B) G may be Abelian (C) G is abelian (D) None of these
5. Which of the following statement is correct.
(A) A group can have more than one identity element
(B) The Null set can be considered to be a group
(C) The set of all real numbers is a group under subtraction
(D) To each element of a group there corresponds only one inverse element.
6. The unit matrix of order n has rank:
(A) zero (B) N (C) 1 (D) None of these
7. If determinant $|A|=2$ then $|A|^5$
(A) 12 (B) 32 (C) 60 (D) None of these
8. If $\begin{bmatrix} a & -b \\ b & a \end{bmatrix}$ is invertible under matrix multiplication then its inverse is:
(A) $\begin{bmatrix} a & -b \\ b & a \end{bmatrix}$ (B) $\frac{1}{a^2+b^2} \begin{bmatrix} a & -b \\ b & a \end{bmatrix}$
(C) $\frac{1}{a^2+b^2} \begin{bmatrix} a & b \\ -b & a \end{bmatrix}$ (D) $\begin{bmatrix} a & b \\ -b & a \end{bmatrix}$
9. A homogeneous system of linear equations has a non trivial solution if:
(A) The number of unknowns exceeds the number of equations
(B) The number of equations exceeds the number of unknowns
(C) The number of unknowns proceeds the number of equations
(D) None of these
10. A Square matrix A such that $A^2=A$ is called
(A) Involuntary (B) Idempotent (C) Nilpotent (D) Symmetric
11. Cofactors of the elements of second row of the determinant $\begin{vmatrix} 1 & 2 & 3 \\ -4 & 3 & 6 \\ 2 & -7 & 9 \end{vmatrix}$
(A) -39, 3, 11 (B) 6, 5, 4 (C) 3, 11, -39 (D) 13, 1, 3

12. A system of m homogeneous linear equations $AX=0$ has a non trivial solution if and only if
(A) Rank A = n (B) Rank A < n (C) Rank A > n (D) None of these

13. The intersection of two infinite sets :
(A) Always infinite (B) Always finite (C) May not be infinite (D) None of these

14. Least upper bound of a set, if exists is:
(A) Infinite (B) Finite (C) Unique (D) Always in fraction

15. The greatest lower bound of a set:
(A) Always belong to set (B) Not belong to set
(B) May or may not belong to set (D) None of these

16. If $a, b \in R$ then:
(A) $|ab| > |a||b|$ (B) $|ab| \geq |a||b|$ (C) $|ab| < |a||b|$ (D) $|ab| \leq |a||b|$

17. A convergent sequence converges to :
(A) A unique limit (B) Many limits (C) Any two limits (D) None of these

18. Every pair of real numbers a and b satisfies one and only one of the conditions:
 $a > b$, $a = b$, $b < a$. This property of real numbers is known as:
(A) Transitive law (B) Associative law (C) Trichotomy law (D) Commutative law

19. $1 + z + \frac{z^2}{2!} + \frac{z^3}{3!} + \dots$ converges to:
(A) e^z (B) e^{-z} (C) $-ze^{z^2}$ (D) None of these

20. The degree of the differential equation of all tangent lines to the parabola $y^2 = 4ax$ is
(A) 3 (B) 1 (C) 2 (D) 4

21. The order of differential equation is defined as :
(A) The highest degree of variable (B) The order of highest derivative
(C) The power of variable in the solution (D) None of these

22. The Differential equation $(1 - x^2) \frac{d^2y}{dx^2} - 2x \frac{dy}{dx} + n(n+1)y = 0$ is
(A) Bessel equation (B) Legendre equation
(C) Poisson Equation (D) None of these

23. If a and b are parallel or anti-parallel vectors ,then
(A) $a \times b = 0$ (B) $a \times b = -b \times a = b$ (C) $a \times b = 0$ (D) None of these

24. The Vector equation of a line through a point with position vector 'a' and parallel to a vector 'b' is (t is scalar).
(A) $r = ta + b$ (B) $r = a + tb$ (C) $r = (1-t)a + tb$ (D) None of these

25. If a and b are unit vectors and ϕ is the angle between them,then value of $|\cos \frac{\phi}{2}| =$
(A) $\frac{1}{2}|a + b|$ (B) $\frac{1}{2}|a - b|$ (C) $|\frac{a-b}{a+b}|$ (D) $|\frac{a+b}{a-b}|$

54. External angle of regular octagon is
 (A) 45° (B) 60° (C) 30° (D) 90°
55. $\lim_{x \rightarrow \infty} \frac{\sin 2x}{x} =$
 (A) 2 (B) 0 (C) Does not exist (D) 1
56. The curve $x^4 + y^4 - 2x^2 - 2y^2 + 1 = 0$ has singular points
 (A) 4 (B) 2 (C) 1 (D) 3
57. The Asymptotes of the curve $y = x^3$ is
 (A) $y = x$ (B) $y = 0$ (C) $x = 0$ (D) None of these
58. The Latusrectum of Parabola $y^2 = 4ax$
 (A) $2a$ (B) $-2a$ (C) $4a$ (D) a
59. The equation $ax^2 + by^2 + 2gx + 2fy + c = 0$ represents
 (A) Parabola (B) Hyperbola (C) Ellipse (D) None of these
60. If a complex number lies in 2nd quadrant then its conjugate lies in which quadrant??
 (A) 1st (B) 2nd (C) 3rd (D) 4th
61. Degree and Order of differential equation $1 + (y')^2 = y$ is
 (A) 1,2 (B) 1,1 (C) 2,1 (D) 2,2
62. The general solution of 3rd order differential equation contains _____ number of arbitrary constants.
 (A) 1 (B) 2 (C) 3 (D) 4
63. The selling price of an article is Rs 118 and profit is 50%. What would be the cost price?
 (A) 78 (B) 77.66 (C) 80 (D) 78.66
64. A boat can travel with the speed of 13 Km/h in water, if the speed of stream is 4Km/h at what time the boat to go 68 Km down stream?
 (A) 3 hours (B) 4 hours (C) 5 hours (D) 2 hours

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