CLASS XII

MATHEMATICS

1 MARK SHORT **100** QUESTIONS

(1). Let Rbe the relation in the set {1,2,3,4} given by R ={(1,2),(2,2),(1,1),(4,4),(1,3),(3,3),(3,2)} Is R symmetric and Transitive?

(2). An equivalence relation R in A divides it into equivalence classes A_1, A_2, A_3.What is the value of $A_1 \cup A_2 \cup A_3$ and $A_1 \cap A_2 \cap A_3$.

(3) Let $A\{1,2,3,\}$ .Find The number of equivalence relations containing (1,2) .

(4) If A is a matrix of order m X n and B is a matrix such that $AB'$and $B'A$ are defined. The order of B is…………………

(5) The elements of a 3×4 matrix are given by $a_{ij} = \frac{1}{2}|-3i + j|$. Write the value of $a_{32} - a_{14}$.

(6) If A and B are square matrix of order 3 and $|A| = 5, |B| = 3$,then the value of $|3AB|$ is.........

(7) Write the order and degree of the differential equation $2x^2 \frac{d^2y}{dx} - 3\left(\frac{dy}{dx}\right)^2 + y = 0.$

(8) What is the value of the constant of integration in the particular solution of the differential equation

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$\frac{dy}{dx} = \frac{2x}{y^2}$ if $f(-2) = 3$.

(9) Find the projection of $\vec{a} = 2\hat{i} + 3\hat{j} + 2\hat{k}$ on $\vec{b} = \hat{i} + 2\hat{j} + \hat{k}$.

(10) For what value of k', the matrix $\begin{pmatrix} 2 & 5 \\ k & 10 \end{pmatrix}$ is a singular matrix?

(11) If a plane has the intercepts a, b, c and is a distance of ′ p ′ units from the origin, then $\frac{1}{a^2} + \frac{1}{b^2} + \frac{1}{c^2} = \cdots$

(12) Find the coordinates of the point where the line $\frac{x-5}{-2} = \frac{y-1}{3} = \frac{z-6}{-5}$ crosses the ZX − plane .

(13) Given two independent events A and B such that $P(A) = 0.3$ and $P(B) = 0.6$ find $P(A \text{ and not } B)$.

(14) Whether true or false. If A and B are events such that $P(A \mid B) = P(B \mid A)$, then $A \cap B = \emptyset$.

(15) Find the area of the region bounded by the curve $y = x^2$ and the line $y = 4$.

(16) $2\begin{pmatrix} 3 & 4 \\ 5 & x \end{pmatrix} + \begin{pmatrix} 1 & y \\ 0 & 1 \end{pmatrix} = \begin{pmatrix} 7 & 0 \\ 10 & 5 \end{pmatrix}$ Find $(x - y)$.

(17) Find K so that the function $f(x) = \begin{Bmatrix} kx + 1, & \text{if } x \leq \pi \\ \cos x, & \text{if } x > \pi \end{Bmatrix}$ Is continuous at $x = \pi$

(18) Find the slope of the normal to the curve $x = 1 - a\sin\theta$, $y = b\cos^2\theta$ at $\theta = \frac{\pi}{2}$.

(19) Find the vector equation of a plane passing through A(2, 5, -3), B(-2,-3, 5) and C(5, 3, -3).

(20) Find the distance between lines $r = \hat{i} + 2\hat{j} - 4\hat{k} + \lambda(2\hat{i} + 3\hat{j} + 6\hat{k})$ and $r = 3\hat{i} + 3\hat{j} - 5\hat{k} + \mu(2\hat{i} + 3\hat{j} + 6\hat{k})$.

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(21) If $A = \{-5,0,3\}$, then what is the number of relations on A

(22) Let $A = \{0,1,2,3\}$ and define a relation R on A as follows: $R = \{(0,0), (0,1), (0,3), (1,0), (1,1), (2,2), (3,0), (3,3)\}$.Is R reflexive? symmetric? transitive ?

(23) For the set $A = \{1,2,3\}$, define a relation R in the set A as follows: $R = \{(a,a), (b,c), (a,b)\}$. Then. write minimum number of ordered pairs to be added to R to make it reflexive and transitive.

(24) Write the maximum number of equivalence relations on the set A $= \{1,2,3\}$

(25) To every square matrix, we can associate a unique number (real or complex) called ……..of that matrix.

(26) If M_{ij} is the minor of the element a_{ij} in the determinant A then the number $(-1)^{i+j} M$ is called the …….. of the element a_{ij} .

(27) If each element on one side of the principal diagonal of a determinant is zero,then the value of the determinant is …..

(28) If $A = [a_{ij}]$ be a square matrix of order n , then $|kA| =$…..

(29) If A and B are square matrices of the same order, then $|AB| = \cdots$

(30) If any two rows (or columns)of a determinant are identical, then the value of determinant is ... ..

(31) The sum of product of elements of any row (or column)of a determinant with their corresponding cofactors is equal ….

(32) The sum of products of elements any row (or column) of a determinant with the cofactors of the corresponding elements of some other row (or column) is equal to…….

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(33) Let A be a skew-symmetric matrix of odd order, then $|A| =$.......

(34) If A is a square matrix of order 2 and $|\mathrm{A}| = -5,$ find the value of $|3\mathrm{A}|$

(35 If A is a square matrix of order 3 and $|\mathrm{A}| = -2,$ find the value of $|5\mathrm{A}|$

(36) If A is a square matrix of order 3 and $|2\mathrm{A}| = \mathrm{k}|\mathrm{A}|$, then write the value of k .

(37) If A is a square matrix such that $|A| = 7$, then write the value of $|AA'|$, where A ' is the transpose of A …..

(38) If A is a square matrix of order 3 such that $|A| = -4$, then find $|\mathrm{adj}\, A|$.

(39) If A is a square matrix of order 3 such that $|\mathrm{A}| = 2$, then find $|\ 3.\ \mathrm{adj}\ A\ |$

(40) If A is a square matrix of order 3 such that $|\mathrm{adj}\, A| = 100$, then find $|A|$.

(41) If $A = \begin{bmatrix} 1 & 3 \\ -1 & 4 \end{bmatrix}$, find $|\mathrm{adj}\, A|$.

(42) For what value of k , the matrix $\begin{bmatrix} 2 & k \\ 3 & 5 \end{bmatrix}$ has no inverse?

(43) If A and B are square matrices of the same order, then $(AB)' =$…

(44) A square matrix A is called symmetric iff $A' =$….

(45) A square matrix A is called skew-symmetric iff $A' =$…….

(46) Every element of leading diagonal of a……………… matrix is zero.

(47) ….. matrix is both symmetric and skew-symmetric matrix.

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(48) Sum of two symmetric matrices is always ……… matrix.

(49) Sum of two skew-symmetric matrices is always………. matrix.

(50) If A is a square matrix, then $A + A^{'}$ is ………….. and $A - A^{'}$ is……….

(51) If A is a symmetric matrix, then A^3 is a matrix……………….

(52) If A is a skew-symmetric matrix, then A^2 is a matrix……….

(53) If A and B are the symmetric matrices of the same order, then $AB + BA$ is…….. and $AB - BA$ is ……..

(54) In applying one or more row operations while finding A^{-1} by elementary row operations, we obtain all zero in one or more rows, then A^{-1}…………..

(55) The order of a matrix is defined as ………

(56) A diagonal matrix in which all diagonal elements are equal is called a ………….

(57) Two matrices A and B are conformable for the matrix multiplication AB if the number of columns of A is same as the………..

(58) How many reflexive relations are possible in a set A whose $n(A) = 3$.

(59) Let A and B be events with $P(A) = \frac{3}{5}, P(B) = \frac{3}{10}$ and $P(A \cap B) = \frac{1}{5}$. Are A and B are independent?

(60) If the matrix $X = \begin{bmatrix} 0 & a & -3 \\ 2 & 0 & -1 \\ b & 1 & 0 \end{bmatrix}$ is skew symmetric, find the value $of\ 'a'\ and\ 'b'$.

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(61) Find the direction cosines of the line that makes equal angles with the coordinate axes.

(62) Find the direction cosines of the line passing through the two points (-2,4,-5) and (1,2,3).

(63) Write the direction cosines of z -axis.

(64) Write the direction cosines of the line joining the points (1,0,0) and (0,1,1)

(65) Write the vector equation of the line $\frac{3-x}{5} = \frac{y+4}{7} = \frac{2z-6}{4}$.

(66) Write the Cartesian equation of the following line given in vector form $\vec{r} = 2\hat{i} + \hat{j} - 4\hat{k} + \lambda(2\hat{i} - \hat{j} - \hat{k})$

(67) Find the Cartesian equation of the line which passes through the point $(-2,4,-5)$ and parallel to the line $\frac{x+3}{3} = \frac{4-y}{5} = \frac{z+8}{6}$

(68) The cartesian equation of a line AB is $\frac{2x-1}{\sqrt{3}} = \frac{y+2}{2} = \frac{z-3}{3}$, Find the direction cosines of a line parallel to AB .

(69) In a LPP, the linear function which has to be maximised or minimised is called……. function.

(70) The linear inequalities or restrictions on the variable of an LPP are called ………

(71) In the objective function $Z = ax + by$, x and y are called ……………. variables.

(72) The common region determined by all the constraints including non negative constraints $x \geq 0, y \geq 0$of an LPP is called the……………. region.

(73) Every point in the feasible region is called a ………..solution to LPP.

(74) A feasible solution of LPP which maximises or minimises the objective function is called ……. solution. .

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(75) In a LPP, the feasible region may be bounded or unbounded, it is always a ………..set.

(76) In a LPP, the objective function is always …………..

(77) In a LPP, if the objective function $Z = ax + by$ has the same maximum value on two corner points of the feasible region, then every point on the line segment joining these two points give the same ………value .

(78) Let R be the feasible region for an LPP and Z=ax+by be the objective function. If R is bounded ,then the objective Z has both a maximum and a minimum value on R and each of these occurs at a ………..of R.

(79) The feasible bounded region for an LPP is always a …………polygon.

(80) Write the equations of x -axis in the space.

(81)If a line makes angles (α,β,γ) with the positive directions of the coordinate axes, then find value of $\sin^2\alpha + \sin^2\beta + \sin^2\gamma$.

(82) If a line makes an angle of $\frac{\pi}{4}$ with each of y and z axis, then find the angle which it makes with x -axis.

(83) If the direction cosines of a line are k . k . k , then find the value of k.

(84) The conditional probability P(A/B) of occurrence of A given that B has already occurred is given by………

(85) If A is any event of sample spaces then (i) $P(A/S) =$…….. (ii) $P(S/A) =$…….

(86) " The conditional probability of an event A given that B has occurred lies between "………………

(87) If A and B are two events such that $P(A \mid B) = p, P(A) = p, P(B) = \frac{1}{3}$ and $P(A \cup B) = \frac{5}{9}$, then p =……..

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(88) If A and B are such that $P(A' \cup B') = \frac{2}{3}$ $P(A \cup B) = \frac{5}{9}$, then $P(A') + P(B') =$

(89) If $P(A \cap B) = \frac{1}{2}, P(A' \cap B') = \frac{1}{3}, P(A) = p$ and $P(B) = 2p$, then find the value of p

(90) Find the length of perpendicular drawn from the origin on the plane $2 x-3 y+6 z-5=0$. Also write a unit vector normal to the plane.

(91 If $A = \{-5,0,3\}$, then what is the number of relations on A ?

(92) Write the maximum number of equivalence relations on the set $A = \{1,2,3\}$

(93) If $R = \{(x, y): x + 2y = 8\}$ is a relation on N, write the range of R.

(94) Let $R = \left\{(a, a^3): a \text{ is a prime number less than } 5\right\}$. Find the range of R .

(95) How many equivalence relations on the set {1,2,3} containing (1,2) and (2,1) are there in all ? Justify your

(96) Find a matrix A such that $2A - 3B + 5C = 0$, where B= $\begin{bmatrix} -2 & 2 & 0 \\ 3 & 1 & 4 \end{bmatrix}$ and $C = \begin{bmatrix} 2 & 0 & -2 \\ 7 & 1 & 6 \end{bmatrix}$

(97) If $x = a\cos\theta; y = b\sin\theta$, then find $\frac{d^2y}{dx^2}$

(98) Consider the set $A = \{1,2,3\}$ and R be the smallest equivalence relation on A , then find R .

(99) If A is skew symmetric matrix of order 3 , then find the value of $|A|$.

(100). Write the slope of normal to the curve $xy = 12$ at the point (3,4) . Also what is the corresponding equation of normal?

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***All The Best ***

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