DAV PUBLIC SCHOOL , GEVRA PROJECT

Class : XII Question Bank 2019-20

MATHEMATICS

==========

Q.1 If $\tan^{-1}x + \tan^{-1}y = 4\pi/5$, then $\cot^{-1}x + \cot^{-1}y$ equals

(i) $\frac{\pi}{3}$ (ii)) $\frac{2\pi}{3}$ (iii)) $\frac{3\pi}{5}$ (iv) π

Q.2 The value of c in Rolle's theorem for the function $f(x) = x^3-3x$ in the interval [0,3] is

(i) 1 (ii) -1 (iii) 3/2 (iv) 1/3

Q.3 Which of the term is not used in a linear programming problem ?

(i) Optional solution (ii) Feasible solution (iii) Concave region (iv) Objective function

Q.4 If A is a matrix of order 3 such that A(adjA) = 10 I.Then the value of I adjA I is =----------

Q.5 If f'(x) changes sign from positive to negative as x increases through c, then c is called point of …….

Q.6 If two lines do not meet and not parallel, then they are known as…….

Q.7 Evaluate : $\int_{-1}^{1} x|x|\,dx$

Q.8 If A' = $\begin{bmatrix} -2 & 3 \\ 1 & 2 \end{bmatrix}$ and B = $\begin{bmatrix} -1 & 0 \\ 1 & 21 \end{bmatrix}$, then find the value of (A + 2B)'.

Q.9 Write the equation of the line $\vec{r}$ = $(2\hat{\imath} + \hat{\jmath})$ + $\mu\,(\hat{\imath}-\hat{\jmath}+4\hat{k})$.

Q.10 If A and B are events such that P(A) = 0.4, P(B) = 0.3 and P(AUB) = 0.5, then P(B'∩A) =

(i) 2/3 (ii) 1/2 (iii) 3/10 (iv) 1/5

Q.11 $\int_{-1}^{1} \frac{dx}{1+x^2}$=

(i) $\frac{\pi}{4}$ (ii) $\frac{\pi}{3}$ (iii) $\frac{\pi}{2}$ (iv) $\frac{\pi}{6}$

Q.12 The equation of the normal to the curve y=sin x at (0,0) is

(i) x=0 (ii) y=0 (iii) x+y=0 (iv) x-y=0

Q.13 $\int_{2}^{3} \frac{dx}{1-x^2}$ is equal to

(i) 1/2 log(2/3) (ii) 1/2log(3/2) (iii) 2/3 log (3/2) (iv) 1/3 log(2/3)

Q.14 If f(x) = $\cos^{-1}$(sin x), then f'(x) =----

(i) 0 (ii) 1 (iii) -1 (iv) none

Q.15 If A and B are symmetric matrices, then AB-BA is …….

Q.16 Solution obtained by giving particular values to the arbitrary constants in the general solutions of a differential equation is called…….

Q.17 `Evaluate : $\begin{vmatrix} 1 & a & b+c \\ 1 & b & c+a \\ 1 & c & a+b \end{vmatrix}$

Q.18 The differential equation of all non-vertical lines in a plane is

(i) $\frac{dy}{dx} = 0$ (ii) $\frac{dx}{dy} = 0$ (iii) $\frac{d^2y}{dx^2}$ = 0 (iv) $\frac{d^2x}{dy^2}$ =0

Q.19 A function f(x) is said to be a ……function on (a,b), if $x_1 < x_2$ implies $f(x_1) \leq f(x_2)$ for all $x_1, x_2 \in (a, b)$

Q.20 If A and B are two mutually exclusive events, then P(A and B) =…….

Q.21 A corner point of a feasible region is a point in the region which is the ……of two boundary lines.

Q.22 The normal at the point (1,1) on the curve $2y+x^2 =3$ is

(i) x+y = 0 (ii) x-y =0 (iii) x+y+1 =0 (iv) x-y+1=0

Q.23 If P(A) = ½, P(B) =0,then $P\left(\frac{A}{B}\right)$ is

(i) 0 (ii) 1/2 (iii) not defined (iv) 1

Q.24 The interval in which $y= x^2e^{-x}$ is increasing with respect to x is

(i) (-∞ , ∞) (ii) (-2,0) (iii) (2, ∞) (iv) (0,2)

Q.25 Find the minimum value of the function h(x) = sin(2x) +5 .

Q.26 An integrating factor of thew differential equation $(1+x^2)\frac{dy}{dx}$ +xy = x is

`(i) $\frac{x}{1+x^2}$ (ii) $\sqrt{1+x^2}$ (iii) $1/2\log(1+x^2)$ (iv) 5x

Q.27 The matrix obtained by interchanging the rows and columns of a given matrix A, is called…….

Q.28 `Find α; such that the line $\frac{x-2}{12} = \frac{y-1}{\alpha} = \frac{z-3}{-8}$ is parallel to the plane 3x-y-2z =7.

(OR)

Find the vector equation of the straight line passing through (1,2,3) and perpendicular to the plane

$\vec{r} .(\hat{i} + 2\hat{j} - 5\hat{k}) + 9 = 0$

Q.29 Find an angle θ which increases twice as fast as its sine.

Q.30 The probability of obtaining an even prime number on each die when a pair of dice is rolled is

(i) 0 (ii) 1/18 (iii) 1/12 (iv) 1/36

Q.31 The total revenue in Rs. received from the sale of x units of a product is given by R(x)=$3x^2$+36x+5.

`The marginal revenue when x=15 is (i) 116 (ii) 96 (iii) 90 (iii) 126

Q.32 The range of $\cos^{-1}x$ is $[0,\pi]$ (True/False)

Q.33 If A and B are matrices of order 3 and $|A|$= 5 ,$|B|$=3,then find $|3AB|$.

Q.34 If 2P(A)=P(B)=5/13 and P(A/B) =2/5, Then P(AUB) =

(i) 11/26 (ii)13/25 (iii) 11/24 (iv) 11/21

Q.35 If a matrix A is both symmetric and skew-symmetric matrix, then A is …….

(OR)

If A is a non-singular square matrix of order n, then $|adj(A)|$ = ……..

Q.36 Any three numbers which are proportional to the direction cosines of a line ,are called……

Q.37 `If E_1 and E_2 are two independent events such that P(E_1)=0.35 and P(E_1UE_2)=0.60, Then P(E_2) is

(i) 4/13 (ii) 3/13 (iii) 5/13 (iv) 8/13

Q.38 Find the projection of the vector $7\hat{i}+\hat{j}-4\hat{k}$ on $2\hat{i}+6\hat{j}+3\hat{k}$.

Q.39 If $4\cos^{-1}x + \sin^{-1}x = \pi, then\ x =$

(i) 3/2 (ii) $1/\sqrt{2}$ (iii) $\sqrt{3}/2$ (iV) $2/\sqrt{3}$

Q.40 What are the direction cosines of a line which makes equal angles with the coordinate axes?

Q.41 A problem in Mathematics is given to three students A,B and C and their respective probability of

Solving the problem is 1/2 ,1/3 and ¼ .Probability that the problem is solved is

(i)3/4 (ii) 1/2 (iii) 2/3 (iv) 1/3

Q.42 The integrating factor of differential equation cos x $\frac{dy}{dx}$ + y sinx = 1 is

(i) cosx (ii) sinx (iii) secx (iv) tanx.

Q.43 A diagonal matrix in which all diagonal element are equal and non-zero is called ……matrix.

(OR)

The sum of products of elements of any row with the cofactors of corresponding elements is equal to…….

Q.44 The angle of intersection between two curves is the angle between the ……to the curves at the point of intersections.

Q.45 `For what value of k, the matrix $\begin{bmatrix} 2-k & 4 \\ -5 & 1 \end{bmatrix}$ is not invertible ?

****

DAV ACC Jamul

SUBJECT- MATHS CLASS (XII)

1 MARKS QUESTIONS

1. Is f*: R* → *R*, given by $f(x) = |x - 1|$ is one-one? Give reason?

2. If $f : \{1, 3\} \to \{1, 2, 5\}$ and $g : \{1, 2, 5\} \to \{1, 2, 3, 4\}$ be given by
   $f = \{(1, 2), (3, 5)\}$, $g = \{(1, 3), (2, 3), (5, 1)\}$
   Write down gof

3. If *f: R* → *A*, given by $f(x) = x^2 - 2x + 2$ is onto function, find set *A*.

4. Evaluate: $\sin [2\cos^{-1}(-3/5)]$.

5. What is the principal value of $\tan^{-1} [\tan 2\pi/3]$?

6. Write the value of $\tan^{-1} (a/b) - \tan^{-1}[(a - b)/(a + b)]$.

7. If $\sin^{-1} x + \sin^{-1} y = 2\pi/3$, then the value of $\cos^{-1} x + \cos^{-1} y$ is ____
8. Suppose P and Q are two different matrices of order 3 × n and n × p, then the order of the matrix P × Q is?

9. A and B are square matrices of order 3 each, |A| = 2 and |B| = 3. Find |3AB|

10. Find the vector equation of a plane which is at a distance of 5 units from the origin and its normal vector is 2

11. If A is a square matrix of order 3 such that |adj A| = 64, find |A|.
12. If A is any square matrix of order 3 × 3 such that |A| = 3, then the value of |adj A| is?

13. If (2 **i** + 6 **j** + 27 **k**) x (**i** + p **j** + q **k**) = 0, then the values of q and q are?

14. If A and B are two events such that P (A) = 0.2, P (B) = 0.4 and P (A U B) = 0.5, then value of P (A/B) is?

15. An urn contains 6 balls of which two are red and four are black. Two balls are drawn at random. Probability that they are of the different colours.

16. For what value of *x*, $f(x) = |2x - 7|$ is not derivable.

17. Write derivative of sin x w.r.t. cos x

18. If $f(x) = x^2 g(x)$ and $g(1) = 6$, $g'(1) = 3$ find value of $f'(1)$.

19. Write the number of points of discontinuity of f(x) = [x] in [3, 7].

20. What is derivative of $|x - 3|$ at $x = -1$.

21. The side of a square is increasing at the rate of 0.2 cm/sec. Find the rate of increase of perimeter of the square.

22. Without using derivatives, find the maximum and minimum value of $y = |3 \sin x + 1|$.

23. Write the interval for which the function $f(x) = \cos x$, $0 \leq x \leq 2\pi$ is decreasing

24. Find the value of a for which the function $f(x) = x^2 - 2ax + 6$, $x > 0$ is strictly increasing

25. If $f(x) = ax + \cos x$ is strictly increasing on R, find a.

26. Find the point on the curve $y = 3x^2 - 12x + 9$ at which the tangent is parallel to x-axis.

27. If a manufacturer's total cost function is $C(x) = 1000 + 40x + x^2$, where x is the output, find the marginal cost for producing 20 units

28. Write the interval in which the function $f(x) = x^9 + 3x^7 + 64$ is increasing

29. Evaluate. $\int e^{\log x + \log\sin x}\, dx$

30. Find the area enclosed by circle $x^2 + y^2 = a^2$

31. Write a unit vector in xy-plane, making an angle of 30° with the +ve direction of x–axis.

32. What is the perpendicular distance of plane $2x - y + 3z = 10$ from origin?

33. What is the angle between the lines $2x = 3y = -z$ and $6x = -y = -4z$?

34. What is the distance between the planes $2x + 2y - z + 2 = 0$ and

$$4x + 4y - 2z + 5 = 0.$$

35. What is the equation of the plane through the point $(1, 4, -2)$ and parallel to the plane –

$$2x + y - 3z = 7?$$

36. What is equation of the plane if the foot of perpendicular from origin to this plane is (2, 3, 4)?

37. If O is origin $OP = 3$ with direction ratios proportional to $-1, 2, -2$ then what are the coordinates of P?

38. Are the planes $x + y - 2z + 4 = 0$ and $3x + 3y - 6z + 5 = 0$ intersecting?

39. Write equation of a line passing through (0, 1, 2) and equally inclined to co-ordinate axes.

40. Find the angle between the planes $2x - 3y + 6z = 9$ and xy – plane.

41. What is the equation of the plane which cuts off equal intercepts of unit length on the coordinate axes.

42. Find $P(A \cap B)$ if A and B are two events such that $P(A) = 0.5$, $P(B) = 0.6$ and $P(A \cup B) = 0.8$

43. A soldier fires three bullets on enemy. The probability that the enemy will be killed by one bullet is 0.7. What is the probability that the enemy is still alive?

DAV PS, Chhal **Mathematics (041)**

Q1. Let R be the relation in the set N given by R={(a,b):a=b-2,b>6}. Choose the correct answer.

(a) (2,4) ∈ R (b) (3,8) ∈ R (c) (6,8) ∈ R (d) (8,7) ∈ R

Q2. If $f: R \to R$ be given by $f(x) = (3 - x^3)^{\frac{1}{3}}$ then $fof(x)$ is

(a) $x^{\frac{1}{3}}$ (b) x^3 (c) x (d)$(3 - x^3)$

Q3. $\tan^{-1}\sqrt{3} - \sec^{-1}(-2)$ is equal to

(a) π (b) $-\frac{\pi}{3}$ (c) $\frac{\pi}{3}$ (d) $\frac{2\pi}{3}$

Q4. if A, B are symmetric matrices of same order, then AB - BA is a

(a) Skew symmetric matrix (b) Symmetric Matrix
(c) Zero matrix (d) Identity matrix

Q5. If $\begin{vmatrix} x & 2 \\ 18 & x \end{vmatrix} = \begin{vmatrix} 6 & 2 \\ 18 & 6 \end{vmatrix}$ then x is equal to

(a)6 (b) ±6 (c) -6 (d) 0

Q6. Which of the following is correct.

(a) Determinant is a square matrix. (b) Determinant is a number associated to a matrix.
(c) Determinant is a number associated to a square matrix (d) None of these

Q7. Derivative of $\cos^{-1}(e^x)$ w.r.t. x is,

(a) $\frac{-e^x}{\sqrt{1-e^{2x}}}$ (a) $\frac{e^x}{\sqrt{1-e^{2x}}}$ (a) $\frac{-e^x}{\sqrt{1+e^{2x}}}$ (a) $\frac{e^x}{\sqrt{1+e^{2x}}}$

Q8. The slope of the normal to the curve $y = 2x^2 + 3\sin x \ \ at\ x = 0$ is

(a)3 (b) $\frac{1}{3}$ (c) -3 (d) $-\frac{1}{3}$

Q9. $\int \frac{dx}{\sin^2 x \cos^2 x}$ equals

(a) tan x +cot x +c (b) tan x –cot x +c
(c) tan x. cot x +c (d) tan x – cot 2x +c

Q10. $\int_1^{\sqrt{3}} \frac{dx}{1+x^2}$ equals

(a) $\frac{\pi}{3}$ (b) $\frac{2\pi}{3}$ (c) $\frac{\pi}{6}$ (d) $\frac{\pi}{12}$

Q11. The point on the curve $y^2 = 8x$ for which the abscisa and ordinate change at the same rate.

(a) (2,4) (b) (1,2) (c) (2,1) (d) (5,2)

Q12. The total revenue received from the sale of x units of a product is given by $R(x) = 13x^2 + 26x + 15$. The marginal revenue when $x = 7$ is

(a) 205 (b) 201 (c) 102 (d)208

Q13. The slope of the tangent to the curve $y = 5x^2 + 3\sin x$ when x=0 is

(a) 2 (b) 3 (c) 5 (d) 1

Q14. The value of c in Rolle's therom when $f(x) = 2x^3 - 5x^2 - 4x + 3,\ x \in \left[\frac{1}{3}, 3\right]$ is

(a) 2 (b) $-\frac{1}{3}$ (c) -2 (d) $\frac{2}{3}$

Q15. The angle of intersection of parabola $y^2 = 4ax$ and $x^2 = 4ay$ at the origin is

(a) $\frac{\pi}{6}$ (b) $\frac{\pi}{3}$ (c) $\frac{\pi}{2}$ (d) $\frac{\pi}{4}$

Q16. Find the equation of the tangent to the curve $y = 4 + \sin^2 x$ at $x = 0$.

Q17. Find the interval in which $f(x) = x^x$ is decreasing.

Q18. At what point the slope of the tangent to the curve $x^2 + y^2 - 2x - 3$ is zero.

Q19. Show that the function $f(x) = x^3 - 3x^2 + 4x, x \in R$, is strictly increasing on R.

Q20. If $= \log_e x$, then find Δy when $x = 3, \Delta x = 0.03$.

Q.21 Area bounded by the curve y = x^3, the x-axis and the ordinates x= -2 and x=1 is

(a) -9 (b) -15/4 (c) 15/4 (d) 17/4

Q.22 If $\vec{a}, \vec{b}$ *and* $\vec{c}$ *are unit vector such that* $\vec{a} + \vec{b} + \vec{c} = \vec{0}$ *then the value* of $\vec{a}.\vec{b} + \vec{b}.\vec{c} + \vec{c}.\vec{a}$ is

(a) 1 (b) 3 (c) -3/2 (d) none of these.

Q.23 In a college, 30% students fail in physics, 25% fail in mathematics and 10% Fail in both. One student is chosen at random. The probability that she fails in physics If she has failed in mathematics is

(a) 1/10 (b) 2/5 (c) 9/20 (d) 1/3

Q.24 The plane 2x-3y+6z-11 =0 makes an angle $\sin^{-1} \propto$ with x- axis.Then The value of α is

(a) 3/2 (b) 2/3 (c) 2/7 (d) 3/7

Q.25 The reflection of the point (α, β, γ) in the xy-plane is

(a) $(\alpha, \beta, 0)$ $(b)\ (0,0,\gamma)$ $(c)\ (-\alpha, -\beta, \gamma)$ $(d)\ (\alpha, \beta, -\gamma)$

Q.26 If $|\vec{a} + \vec{b}| = 60$, $|\vec{a} - \vec{b}| = 40$ *and* $|\vec{a}| = 22$, *then the value of* $|\vec{b}|$

(a) 64 (b) 46 (c) 100 (d) 62

Q.27 If $\vec{a} = xi + 2j - zk$ *and* $\vec{b}$ = 3i-yj+k are two equal vectors,then the value of x + y + z is

(a) 0 (b) 1 (c) -2 (d) -1

Q.28 Write the equation of line passing through the point (α, β, γ) and parallel To z-axis.

Q.29 If the fessible region for a LPP is _____, then the optimal value of the Objective function Z = ax +by may or may not exist.

Q30. If P(E) = 7/13, P(F) = 9/13 and P(EUF) = 8/13 then the value of P(F/E) is_____.

Q31. $\cos^{-1}\left(\cos\frac{7\pi}{6}\right)$ is equal to

(a) $\frac{7\pi}{6}$ (b) $\frac{5\pi}{6}$ (c) $\frac{\pi}{3}$ (d) $\frac{\pi}{6}$

Q32. Matrices A and B will be inverse of each other only if,

(a) AB=BA (b) AB =BA =0 (c) AB=0,BA=I (d) AB=BA=I

Q33. $\int_0^{\frac{\pi}{4}} \tan x \, dx$ is equal to

(a) $\frac{1}{2}log2$ $(b)-\frac{1}{2}log2$ $(c)2log\frac{1}{2}$ $(d)-2log\frac{1}{2}$

Q34. $\tan^{-1}\left(\sqrt{3}\right)-\cot^{-1}\left(-\sqrt{3}\right)$ is equal to

(a) π $(b)\frac{-\pi}{2}$ (c) 0 (d) $2\sqrt{3}$

Q35. If the matrix A is both symmetric and skewsymmetric then,

(a) A is a diagonal matrix (b) A is zero matrix
(c) A is a square matrix (d) None of these

Q36. $\int_0^1 \frac{1}{\sqrt{1-x^2}}$ dx is equal to

(a) $\frac{\pi}{2}$ $(b)-\frac{\pi}{2}$ $(c)\frac{\pi}{4}$ $(d)-\frac{\pi}{4}$

Q37. If the curve $ay+x^2=7$ and $x^3=y$ cut orthogonaly at (1,1) then the value of a is

(a) 1 (b)0 (c) -6 (d)6

Q38. Which of the following function is decreasing on $(0,\frac{\pi}{2})$

(a) sin 2x (b) tan x (c) cos x (d) cos 3x

Q39. The equation of normal to the curve $y=\tan x$ at (0,0) is _____

Q40. If the $\int_0^a 3x^2dx=8$, then the value of a is

(a) 3 (b) 1 (c) 8 (d) 2

Monnet DAV PS Raigarh-1

QUESTION BANK MATHEMATICS CLASS-X

Section –A

1. Zeroes of $P(Z)=Z^2-27$ are
   (A) $3\sqrt{3}$
   (B) $-3\sqrt{3}$
   (C) None of these
   (D) $\pm 3\sqrt{3}$
2. The ratio between the LCM and HCF of 5,15,20 is:-
   (A)9:11
   (B) 4:3
   (C) 11:1
   (D) 12:1
3. If the $P(x)=ax^2+bx^2+c$, then –b/a is equal to
   (A) 0
   (B) 1
   (C) product of zeros
   (D) sum of zeros
4. The pair of equations ax +by =7 and 3x+3y = 16 represented parallel lines if
   (A) a=b

(B) 3a =3b
(C) 2a =3b
(D) ab = 6

5. $(x^2 +1) – x^2 =0$ has
(A)Four real roots
(B) Two real roots
(C) No real roots (D) one real roots

6. If the third of AP is 12 and the seventh terms is 24. Then tenth term is
(A)34
(B) 35
(C) 36
(D) 33

7. If the distance between the points (4,P) and (1,0) is 5 unit ,then the values of p is
(A) 4 only
(B) ±4
(C) -4
(D) 0

8. The values of $\sin^2 30 - \cos^2 30$ is
(A)9:11
(B) 4:3
(C) 11:1
(D) 12:1

9. The line drawn from the eye of an observer to the points in object viewed by the observer is known as
(A) Horizontal line
(B) Vertical line
(C) Line of sight
(D) Transversal line

10. From a point Q , the length of the tangent to a circle is 24cm and the distance of Q from the center is 25cm the radius of circle is
(A) 7cm
(B) 12cm
(C) 15cm
(D) 24.5 cm

11. The perimeter (in cm) of a square circumscribing a circle of radius a cm is
(A) 8a
(B) 4a
(C) 2a
(D) 16a

12. The radius (in cm) of the tangent right circular cone that can be cut out from a cube of edge 4.2 cm is
(A) 4.2
(B) 2.1
(C) 8.1
(D) 1.05

13. The shape of a Gilli ,in the Gilli Danda game is a combination of
(A)Two cylinders
(B) A cone and a cylinder
(C) Two cones and a Cylinders
(D) Two cylinders and a cone

14. The abscissa of a point of intersection of both types (less than and more then) of commulative frequency curves help in finding.

(A) Mean
(B) Median
(C) Mode
(D) None of these

15. The probability of throwing a numbers greater then 2 with a fair die is

(A) 2/3
(B) 5/6
(C) 1/3
(D) 2/5

Short answer type questions:

1. Write the sum of the exponents of prime factor in the prime factorization of 250 .
2. The decimal expansion of number $\frac{441}{2*5*7}$ has decimal representation.
3. Verify that x=3 is a zero of the polynomial.
4. Find the products of the zeros of $-2x^2+kx+6$.
5. The seventeenth terms of an AP exceeds its tenth term by 7 . find the common difference.
6. ABC is an isosceles triangle right angled at C . then prove that $AB^2=2AC^2$.
7. Find the distance between the point (2,3) and (4,1).
8. In triangle ABC , right angled at B, AB=5cm and sin c=1/2 , determine of side AC.
9. Find value of $\sin^2 30 - \cos^2 30$.
10. Find the area of quadrant of a circle whose circumference is 44 cm.
11. Find the class mark of 10 -25.
12. Find the probability of getting both side is a coin is tossed twice.
13. Find the products of zeroes of $-2x^2+kx+6$.
14. The pair of equations ax +2y=7 and 3x+by=16 represented condition of parallel lines.
15. If x=2 is a solution of the equation $x^2-5x+6k= 0$, then find value of k.

Fill in the blanks:-

1. Reciprocal of cotA IS _____.
2. A line intersecting a circle in two points is called a _____.
3. The common point of tangent of a circle and the circle is called a _____.
4. All circles are _____.
5. All _____ triangles are equal.
6. If 3cotØ = 2, then value of tanØ = _____.
7. The study of relationship between the sides and angles of a triangle is known as_____
8. A tangent to a circle intersect it in points _____ cone.
9. Area of sector is _____.
10. 3 median = mode + _____.

Answerkey

OBJECTIVES

1. ±3√3 2. 12:1 3. SUM OF ZEROES 4. ab=6 5. NO real roots
6. 33 7.±4 8. -1/2 9. Line of sight 10. 7cm
11. 8a 12. 2.1 13. two cones and cylinder 14.median 15. 2/3

Short answer type questions:-

1. $250=2*5^3$ sum of exponents = 1+3
2. Number $\frac{441}{2*5*7}$, the denominator 2^2*5^3 is of the from 2^3*5^n ,where m and n are non negative integers. Hence it has terminating decimal represented.

3. $P(x)=2x^3-5x^2-4x+3$ if p(3)=0.
4. Here a=-2 , b=k , c=6, product of zeroes = c/a, = 6/-2 =3.
5. $A_{17}- A_{10}=7$, 7d=7 , so d=1
6. $AB^2 = 2AC^2$ AND AC=BC (GIVEN) SO by THE PYTHAGORAS theorem it proved.
7. By the using of distance formula $\sqrt{8} = 2\sqrt{2}$.
8. Ac = 10cm.
9. -1/2.
10. Area of quadrant = 77/2.Type equation here.
11. Class mark = 17.5
12. Probability of getting head = ¼
13. Product of zeroes = -3
14. For a condition of parallel lines is $\frac{a}{3} = \frac{2}{b} \neq \frac{7}{16}$, ab = 6.
15. K = 1.

FILL IN THE BLANKS

1. tan A 2. secant 3.points of contact 4. Similar 5. Equilatral

6. 3/2 7. Hypotenuse 8. One 9. Area of circle –area of minor sector
10. 2*mean

Monnet DAV PS Raigarh-2

QUESTION BANK **CLASS-XII** **MATHEMATICS**

1.Let A={1,2,3}.Then the number of equivalence relation containing (1,2) is:
(a)1 (b)2
(c)3 (d)4

2.Let R be a relation on the set N of natural numbers defined by nRm if n divides m.Then R is:
(a)Reflexive and Symmetric (b)Transitive and Symmetric
(c)Equivalence (d)Reflexive,transitive but not symmetric

3.Set A has 3 elements and the set B has 4 elements.Then the number of injective mappings that can be defined from A to B is :
(a)144 (b)12
(c)24 (d)64

4.If $\sin^{-1}x = y$,then:
(a)$0 \le y \le \pi$ (b) $-\frac{\pi}{2} \le y \le \frac{\pi}{2}$
(c)$0 < y < \pi$ (d) $-\frac{\pi}{2} < y < \frac{\pi}{2}$

5.$\cos^{-1}(\cos \frac{7\pi}{6})$ is equal to :
(a) $\frac{7\pi}{6}$ (b) $\frac{5\pi}{6}$
(c) $\frac{\pi}{3}$ (d) $\frac{\pi}{6}$

6.The number of all possible matrices of order 3x3 with each entry 0 or 1 is:
(a)27 (b)18
(c)81 (d)512

7.Assume X and Z are matrices of order 2 x n and 2 x p.
If n=p,then the order of 7X-5Z is:
(a)p x 2 (b)2 x n
(c)n x 3 (d)p x n

8.If A and B are symmetric matrices of same order,then AB-BA is a:
(a)Skew-symmetric matrix (b)Symmetric matrix
(c)Zero matrix (d)Identity matrix

9.Matrices A and B will be inverse of each other only if:

(a)AB=BA (b)AB-BA=O

(c)AB=O,BA=I (d)AB=BA=I

10.If $\begin{matrix} x & 2 \\ 18 & x \end{matrix} = \begin{matrix} 6 & 2 \\ 18 & 6 \end{matrix}$,then x is equal to:

(a)6 (b)±6

(c)-6 (d)0

11.Let A be a non-singular matrix of order 3x3.Then I adj AI is equal to :

(a)IAI (b)IAI^2

(c)IAI^3 (d)3IAI

12.The function $f(x) = \begin{cases} \frac{\sin x}{x} + \cos x, & x \neq 0 \\ k, & x = 0 \end{cases}$ is continuous at x=0,then the value of k is:

(a)3 (b)2

(c)1 (d)1.5

13.The function f(x)=[x],where [x] denotes the greatest integer function,is continuous at:

(a)4 (b)-2

(c)1 (d)1.5

14.The rate of change of the area of a circle with respect to its radius r at r=6 cm is:

(a)10π (b)12π

(c)8π (d)11π

15.The total revenue received from the sale of x units of a product is given by $R(x)=3x^2+36x+5$.The marginal revenue ,when x=15 is:

(a)116 (b)96

(c)90 (d)126

16.The slope of the normal to the curve $y=2x^2+3\sin x$ at x=0 is:

(a)3 (b)1/3

(c)-3 (d)-1/3

17.The point on the curve $x^2=2y$,which is nearest to the point (0,5) is:

(a)(2√2,4) (b)(2√2,0)

(c)(0,0) (d)(2,2)

18.$\int \frac{10x9+10x\log e10}{x10+10x}$ dx equals:

(a)$10^x-x^{10}+c$ (b)$10^x+x^{10}+c$

(c)$(10^x-x^{10})^{-1}+c$ (d)$\log(10^x+x^{10})+c$

19.$\int ex(\sec x(1+\tan x)dx$ equals:

(a)$e^x \cos x + c$ (b)$e^x \sec x + c$

(c)$e^x \sin x + c$ (d) $e^x \tan x + c$

20.If $f(x)=\int_0^x t \sin t \, dt$,then f'(x) is:

(a)cos x + x sin x (b)x sin x

(c)x cos x (d)sin x + x cos x

21.Find the area lying in the first quadrant and bounded by the circle $x^2+y^2=4$ and the lines x=0 and x=2.

22.What is the area enclosed by the ellipse $\frac{x2}{a2}+\frac{y2}{b2}=1$?

23.Write the degree of the differential equation $(\frac{d2y}{dx2})^3+(\frac{dy}{dx})^2+\sin(\frac{dy}{dx}) + 1 = 0.$

24.What is the order of the differential equation $2x^2 + \frac{d2y}{dx2} - 3\frac{dy}{dx} + y = 0$.

25.The number of arbitrary constants in the general solution of a differential equation of fourth order is _____.

26.The number of arbitrary constants in the particular solution of a differential equation of third order is _____.

27.In ΔABC,what is the value of AB+BC+CA=?

28.When the vectors a and b are collinear?

29.Find the magnitude of the vectors 6i+2j+3k.

30.What is the distance of a point P(a,b,c) from x-axis?
31.If the direction cosines of a line are <k,k,k>,then find the value of k.
32.The reflection of the point (a,b,c) in the xy-plane is _____.
33.The corner points of the feasible region determined by the following system of linear inequalities:2x+y≤10,x+3y≤,x,y≥0 are(0,0),(5,0),(3,4) and (0,5).
Let Z=px+qy,where p,q>0.What is the condition on p and q so that the maximum of Z occurs at both (3,4) and (0,5).
34.If P(A)=1/2,P(B)=0,then P(A/B)=_____?
35.If A and B are events such that P(A/B)=P(B/A),then what is the condition for A and B?
36.When two events A and B are said to be independent?
37.Let A and B be two events.If P(A)=0.2,P(B)=0.4,P(AUB)=0.6,then P(A/B) is _____.
38.If A is a square matrix such that A^2=A,then$(I+A)^3$-7A is equal to _____.
39.Determinant is a number associated to a _____.
40.The area of a triangle with vertices (-3,0),(3,0) and (0,k) is 9 sq. units.The value of k will be _____.

Answer:

1.(b)2
2.(b)Transitive and symmetric
3.(c)24
4. (b) - $\frac{\pi}{2} \leq y \leq \frac{\pi}{2}$
5. (b) $\frac{5\pi}{6}$
6. (d)512
7. (b)2 x n
8. (a)Skew-symmetric matrix
9. (d)AB=BA=I
10. (b)±6
11. (b)$|A|^2$
12. (b)2
13. (d)1.5
14. (b)12π
15. (d)126
16. (d)-1/3
17. (a)(2√2,4)
18. (d)$\log(10^x+x^{10})+c$
19. (b)e^x sec x + c
20. (b)x sin x
21.π
22.πab
23.Not defined
24.2
25.4
26.0
27.0
28.Both the vectors a and b have the same direction but different magnitudes.
29.7
30.$\sqrt{(b^2+c^2)}$
31.k=1
32.(a,b,-c)
33.q=3p
34.Not Defined
35.P(A)=P(B)
36.P(A∩B)=P(A)P(B)
37.0

38.I
39.Square Matrix
40.3

Prepared By:
NAROTTAM KUANR,TGT(MATHS)
MONNET DAV PUBLIC SCHOOL,
NAHARPALI,RAIGARH,C.G.

DAV PS Rajahra

CLASS – XII **1 – MARKS QUESTION BANK**

1. 1) If $\begin{vmatrix} 3x & 7 \\ -2 & 4 \end{vmatrix} = \begin{vmatrix} 8 & 7 \\ 6 & 4 \end{vmatrix}$, then the value of x is

   a) 3 b) -4 c) -2 d) 0

2. $\int \frac{\sin^2 x - \cos^2 x}{\sin x \cos x}\, dx$ is

   a) log (cosec 2x) +c b)log($\sin 2x$) +c c) $-\cos 2x$ d) $\sec 2x$ +c

3. If the Cartesian equations of a line are $\frac{3-x}{5} = \frac{y+4}{7} = \frac{2z-6}{4}$, then the vector equation of the line is ……

4. If y = $\tan^{-1}(\sin\sqrt{x}$) then $\frac{dy}{dx}$ is

   a) $\frac{\cos\sqrt{x}}{2\sqrt{x}\,(1+sin^2\sqrt{x})}$ b) $\frac{\sin\sqrt{x}}{2\sqrt{x}\,(1+sin^2\sqrt{x})}$ c) $\frac{-\cos\sqrt{x}}{2\sqrt{x}\,(1+sin^2\sqrt{x})}$ d) $\frac{-\sin\sqrt{x}}{\sqrt{x}\,(1+sin^2\sqrt{x})}$

5) If A_{ij} is the cofactor of the element a_{ij} of the determinant $\begin{vmatrix} 2 & -3 & 5 \\ 6 & 0 & 4 \\ 1 & 5 & -7 \end{vmatrix}, then$ the value of $a_{32}.A_{32}$ is

a) 112 b)110 c) -112 d) -110

6) If $\tan^{-1}x + \tan^{-1}y = \frac{\pi}{4}$, xy <1, then the value of x + y + x y is

   a) 1 b) -1 c) 0 d) -3

7) Find the value of 'p' for which the vectors $3\hat{\imath} + 2\hat{\jmath} + 9\hat{k}$ and $\hat{\imath} - 2p\hat{\jmath} + 3\hat{k}$ are parallel.

   a) P = $\frac{-1}{3}$ b) P = $\frac{1}{3}$ c) P = $\frac{-2}{3}$ d) P = $\frac{-4}{3}$

8) If $\int_0^a \frac{1}{4+x^2}\, dx = \frac{\pi}{8}$, then the value of a is

   a) -2 b) 0 c) 4 d) 2

9) If P(A) =0.8 , P(B) = 0.5 and P(B/A) = 0.4 then the value of $P(A \cap B)$ is

   a) 0.34 b) 0.32 c) 0.42 d) 0.38

10) vector of magnitude 12 units in the direction of vector $\hat{\imath} - 2\hat{\jmath} + 2\hat{k}$ is

a) $4\hat{i} - 8\hat{j}+8\hat{k}$ b) $8\hat{i} - 4\hat{j}+8\hat{k}$ c) $4\hat{i} - 8\hat{j}-8\hat{k}$ d) $4\hat{i} + 8\hat{j}+8\hat{k}$

11) If A is a square matrix of order 2 and $|A| = 7$ then the value of $|A.\,AdjA|$ is

a) 49 b) 343 c) 64 d) 36

12) the value of integration $\int e^{-\log \sec x}$ dx is

a) $\sin x$ +c b) $-\sin x$ +c c) $\cos x$ +c d) $\sec x$+c

13) Find the value of A+A' if matrix **A =** $\begin{bmatrix} 4 & -1 \\ 6 & 2 \end{bmatrix}$

14) The value of $\tan^{-1} 1 - \sec^{-1}(-\frac{2}{\sqrt{3}})$ **is**

a) $\frac{5\pi}{8}$ b) $\frac{-5\pi}{12}$ c) $\frac{7\pi}{12}$ d) $\frac{-7\pi}{12}$

15) Write the direction cosine of a vector parallel to the line $\frac{4-x}{2} = \frac{y+3}{3} = \frac{z+2}{6}$

16) Find the distance between the planes 2x+3y+4z = 4 and 4x+6y+8z= 12

17) The distance of the point (2,1,-1) from the plane x – 2y + 4z = 9 is ……

18) Evaluate P(AUB) , if 2P(A) = P(B) = $\frac{5}{13}$ and P(A/B) = $\frac{2}{5}$.

19) The order and degree of the differential equation $(y'')^2 + \cos y' = 0$ is

(a) order- 2 degree -1 b) order- 2 degree -2 c) order- 2 degree –Not defined d) order- 1 degree -2

20) write the order of the differential equation representing the family of ellipses having centre at origin and foci on X- axis.

21) If $\vec{a} = \hat{\imath} + 3\,\hat{\jmath} + 7\,\hat{k}$ and $\vec{b} = 7\hat{\imath} - \hat{\jmath} + 8\,\hat{k}$,then the projection of $\vec{a}$ on $\vec{b}$ is

a) $\frac{60}{\sqrt{114}}$ b) $\frac{60}{\sqrt{112}}$ c) $\frac{58}{\sqrt{114}}$ d) $\frac{54}{\sqrt{110}}$

22) The slope of the normal to the curve x = a$\cos^3\theta$, y = a $\sin^3\theta$ at $\theta = \frac{\pi}{4}$ is

a) -2 b) 1 c) -1 d) 4

23) If x is real, find the minimum value of x^2- 8 x + 17.

24) If the function f(x) = 2x^2- k x +5 is increasing on [1, 2], then k lies in the interval

a) $(-\infty, 4)$ b) $(4, \infty)$ c) $(-\infty, 8)$ d) $(8, \infty)$

25) The minimum value of x $\log_e x$ is equal to

a) e b) 1/e c) - 1/e d) 2/e

26) If R is a relation on the set A = {1, 2, 3,} given by R = { (1, 1), (2, 2), (3, 3) } , then R is

a) reflexive b) symmetric c) transitive d) all the three option

27) If f:R→R is given by f(x) = x^3+3, then f^{-1}(x) is equal to

a) $x^{1/3}$-3 b) $x^{1/3}$+3 c) $(x-3)^{1/3}$ d) x +$3^{1/3}$

28) The function f: [0, ∞) → R given by f(x) = $\frac{x}{x+1}$ is

a) one-one and onto b) one-one but not onto

c) onto but not one-one d) neither one-one nor onto

29) If x = t^2, y = t^3, then $\frac{d^2y}{dx^2}$ =

a) 3/2 b) 3/4t c) 3/2t d) 3t/2

30) If y = $\sqrt{\sin x + y}$, then $\frac{dy}{dx}$ =

a) $\frac{\sin x}{2y-1}$ b) $\frac{\sin x}{1-2y}$ c) $\frac{\cos x}{1-2y}$ d) $\frac{\cos x}{2y-1}$

31) The solution of $x^2 + y^2 \frac{dy}{dx}$ = 4 is

a) $x^2 + y^2$=12x+c b) $x^3 + y^3$=3x+c c) $x^2 + y^2$=3x+c d) $x^3 + y^3$=12x+c

32) Out of 30 consecutive integers, 2 are chosen at random. The probability that their sum is odd, is

a) $\frac{14}{29}$ b) $\frac{16}{29}$ c) $\frac{15}{29}$ d) $\frac{10}{29}$

33) If A = $\begin{bmatrix} 5 & x \\ y & 0 \end{bmatrix}$ and A = A^T, then

a) x = 0, y = 5 b) x + y = 5 c) x = y d) none of these

34) If A is a square matrix such that A^2 = I, then A^{-1} is equal to

a) A + I b) A c) 0 d) 2A

35) The area between x-axis and curve y = $\cos x$ when 0$\leq x \leq 2\pi$ is

a) 0 b) 2 c) 3 d) 4

36) The area bounded by the parabola y^2 = 4ax and x^2 = 4ay is

a) $\frac{8a^3}{3}$ **b)** $\frac{16a^2}{3}$ **c)** $\frac{32a^2}{3}$ **d)** $\frac{64a^2}{3}$

37) Objective function of a LPP is

a) a constant b) a function to be optimized c) a relation between the variables d) none of these

38) The point which does not lie in the half plane 2 x + 3 y – 12 $\leq$ 0 is

a) (1, 2) b) (2, 1) c) (2, 3) d) (-3, 2)

39) Find $\int \frac{3+3\cos x}{x+\sin x}\, dx$

40) If $\begin{bmatrix} 1 & 2 \\ 2 & 1 \end{bmatrix} \begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} 5 \\ 4 \end{bmatrix}$, then value of y is .....

ANSWER - 1(c) 2(a) 3) $\vec{r} = 3\hat{\imath} - 4\hat{\jmath} + 3\hat{k} + \mu(-5\hat{\imath} + 7\hat{\jmath} + 2\hat{k})$

4(a) 5(b) 6(a) 7(a) 8(d) 9(b) 10(a) 11(a) 12(a) 13) $\begin{bmatrix} 8 & 5 \\ 5 & 4 \end{bmatrix}$ 14(d) 15) $\frac{-2}{7}, \frac{3}{7}, \frac{6}{7}$

16) $\frac{2}{\sqrt{29}}$ 17) $\frac{13}{\sqrt{21}}$ 18) $\frac{11}{26}$

19) (c) 20) 2 21(a) 22(b) 23) 1 24(a) 25(c) 26(d) 27(c) 28(b) 29(b) 30(d) 31(d) 32(c) 33(c) 34(b) 35(d) 36(b) 37(b) 38(c) 39) $\log(x+\sin x)^3$+c 40) y =2

DAV PUBLIC SCHOOL , CHIRIMIRI

Question Bank (1 Mark)

1. Is the relation $R = \{(1,2),(2,1) in\ the\ set\ \{1,2,3\}$ transitive? Give reason.
2. If $f: R \to R\ defined\ by\ f(x) = (3 - x^3)^{\frac{1}{3}}, then\ fof(x) is\ equal\ to$ a) x b) –x c) $\frac{1}{x}$ d) none of these.
3. If f is an invertible function defined as $f(x) = \frac{3x-4}{5}$ $then\ find\ f^{-1}(x).$
4. If $\tan^{-1}x + \tan^{-1}y = \frac{\pi}{4}, xy < 1, then\ the\ value\ of\ x = y = xy\ is$ a) 0 b) 1 c) 2 d) 3
5. Write the value of $\cos^{-1}\left(\frac{-1}{2}\right) + 2\sin^{-1}\left(\frac{1}{2}\right)$.
6. Write the principal value of $\tan^{-1}\left(\tan\frac{9\pi}{8}\right)$.
7. Write the principal value of $\tan^{-1}\sqrt{3} - \sec^{-1}(-2)$.
8. If $2\begin{bmatrix} 3 & 4 \\ 5 & x \end{bmatrix} + \begin{bmatrix} 1 & y \\ 0 & 1 \end{bmatrix} = \begin{bmatrix} 7 & 0 \\ 10 & 5 \end{bmatrix}, then\ the\ value\ of\ (x-y)\ is$ a) 0 b) 10 c) -10 d) none of these.

9. If $\begin{bmatrix} x & 1 \end{bmatrix}\begin{bmatrix} 1 & 0 \\ -2 & 0 \end{bmatrix} = 0, then\ the\ value\ of\ x\ is$ a) 0 b) 1 c) 2 d) -2
10. If A is a square matrix such that $A^2 = A, then\ 7A - (I + A)^3\ is\ equal\ to$ a) 0 b) I c) –I d) A
11. If $\begin{bmatrix} a+4 & 3b \\ 8 & -6 \end{bmatrix} = \begin{bmatrix} 2a+2 & b+2 \\ 8 & a-8b \end{bmatrix}, then\ find\ the\ value\ of\ a - 2b.$
12. If $\begin{vmatrix} x+1 & x-1 \\ x-3 & x+2 \end{vmatrix} = \begin{vmatrix} 4 & -1 \\ 1 & 3 \end{vmatrix}, then\ the\ value\ of\ x\ is$ a)1 b) -1 c) 2 d) -2
13. If A is a square matrix and |A| = 2, then find the value of $|AA^T|$.
14. For what value of x, the matrix $\begin{bmatrix} 5-x & x+1 \\ 2 & 4 \end{bmatrix}\ is\ singular?$
15. Evaluate $\int \cos^{-1}(\sin x)\ dx.$
16. Evaluate $\int \frac{dx}{\sin^2 x \cos^2 x}$.
17. Evaluate $\int e^x(\tan x + 1)\sec x\ dx.$
18. Evaluate $\int \frac{e^{\tan^{-1}x}}{1+x^2} dx.$
19. Evaluate $\int_0^1 \frac{1}{\sqrt{2x+3}}\ dx$.
20. If $f(x) = |\cos x|, find\ f^I\left(\frac{3\pi}{4}\right).$
21. The function $f(x) = \begin{cases} kx^2, & x \le 2 \\ 3, & x > 2 \end{cases}\ is\ continuous\ at\ x = 2, then\ the\ value\ of\ k\ is$ a) 0 b)1 c) $\frac{3}{4}$ d) $\frac{4}{3}$
22. The value of c in Mean Value Theorem for the function $f(x) = x(x-2), x \in [1,2]\ is$ a) 0 b) 1 c) $\frac{3}{2}$ d) $\frac{-3}{2}$.
23. The sides of an equilateral triangle is increasing at the rate o 2 cm/sec. find the rate at which the area increases, when side is 10 cm.
24. Find the slope of the tangent to the curve $y = x^3 - x + 1$ at the point whose x-coordinate is 2.
25. If the function $f(x) = k(x + \sin x) + k$ is increasing, then a) k = 0 b) $k > 0$ c) $k < 0$ d) $k \neq 0$.
26. If x is real, find the minimum value of $x^2 - 8x + 17.$
27. Find the area bounded by the curve $y = \sin x, x - axix, x = 0\ and\ x = \pi.$
28. Write the order and degree of the differential equation $y = x\frac{dy}{dx} + a\sqrt{1 + \left(\frac{dy}{dx}\right)^2}$.
29. Write the order and degree of the differential equation $\left(\frac{d^2y}{dx^2}\right)^2 + \left(\frac{dy}{dx}\right)^2 = x\sin\left(\frac{dy}{dx}\right)$.
30. find the general solution of the differential equation $\frac{dx}{x} + -- \frac{dy}{y} = 0.$
31. Write the direction cosines of the vector $-2\boldsymbol{i} + \boldsymbol{j} - 5\boldsymbol{k}$.
32. Write a vector of magnitude 15 units in the direction of vector $-2\boldsymbol{j} + 2\boldsymbol{k}$.
33. If $\boldsymbol{p}$ is a unit vector and $(\boldsymbol{x} - \boldsymbol{p}).(\boldsymbol{x} + \boldsymbol{p}) = 80, then\ find\ |\boldsymbol{x}|.$
34. Find k when the scalar projection of $\boldsymbol{a} = k\boldsymbol{i} + \boldsymbol{j} + 4\boldsymbol{k}\ on\ \boldsymbol{b} = 2\boldsymbol{i} + 6\boldsymbol{j} + 3\boldsymbol{k}\ is\ 4\ units.$
35. Find the value of α if $(2\boldsymbol{i} + 6\boldsymbol{j} + 14\boldsymbol{k}) \times (\boldsymbol{i} - \alpha\boldsymbol{j} + 7\boldsymbol{k}) = \boldsymbol{0}.$
36. Write the given equation of line in vector form : $\frac{3-x}{5} = \frac{y+4}{7} = \frac{2z-6}{4}$.
37. Write the equation of the line which passes through the point (-2, 4, -5) and parallel to the line $\frac{x+3}{3} = \frac{4-y}{5} = \frac{z+8}{6}$.
38. Find the equation of the plane which bisect the line segment joining the points (2, 3, 5) and (4, 5, 7) at right angle.
39. Find the value of k so that the lines $\frac{1-x}{3} = \frac{7y-14}{2k} = \frac{z-3}{2}\ and\ \frac{7-7x}{3k} = \frac{y-5}{1} = \frac{6-z}{5}$ are perpendicular to each other.
40. Find the vector equation of a plane which is at a distance of 7 units from the origin and which is normal to the vector $3\boldsymbol{i} + 5\boldsymbol{j} - 6\boldsymbol{k}.$

41. Write the equation of the plane passing through the points (2, 0, 0), (0, 3, 0) and (0, 0, 4).
42. If A and B are two events such that $P(A) = \frac{1}{2}, P(B) = \frac{1}{3}$ and $P(A \cap B) = \frac{1}{4}$, then find $P(\frac{A'}{B})$.
43. If A and B are two independent events with $P(A) = 0.3$ and $P(B) = 0.6$, then find $P(\text{neither } A \text{ nor } B)$.
44. A die is thrown and a card is selected from a deck of 52 cards. Find the probability of getting an even number on the die and a spade card.
45. The probability distribution of random variable X is given below :

X	2	3	4	5
P(X)	$\frac{5}{k}$	$\frac{7}{k}$	$\frac{9}{k}$	$\frac{11}{k}$

Find the value of k.

46. Two cards are drawn at random one by one without replacement from a deck of 52 playing cards. Find the probability that both the cards are black.
47. Define optimal solution in an LPP.
48. Evaluate $\int_{-5}^{5} |x + 2|\, dx$.
49. Evaluate $\int_{-1}^{1} x^{17} \cos^4 x\, dx$.
50. Find the derivative of $\sin x$ with respect to $\tan x$.

DAV PS, BHATGAON

1 Marks Question
Class – XII Maths

1. Find the value of a and b , if A = B ,where A = $\begin{bmatrix} a+4 & 3b \\ 8 & -6 \end{bmatrix}$ and B = $\begin{bmatrix} 2a+2 & b^2+2 \\ 8 & b^2-5b \end{bmatrix}$.
2. Find the value of $\hat{\imath}.(\hat{\jmath} \times \hat{k}) + \hat{\jmath}.(\hat{\imath} \times \hat{k}) + \hat{k}.(\hat{\imath} \times \hat{\jmath})$.
3. If the function f : R $\rightarrow$ R ,defined by f(x) = 3x – 4 is invertible , find f^{-1} .
4. Using the principal value , find the value of $cos^{-1}\left(cos\ \frac{13\pi}{6}\right)$.
5. Find a vector in the direction of a vector $\vec{a} = \hat{\imath} - \hat{\jmath} + \hat{k}$, which has magnitude 8 units .
6. Write the direction cosines of vector $2\hat{\imath} - \hat{\jmath} + 3\hat{k}$.
7. If f$(x) = x + 7$ and g$(x) = x - 7, x \in R$, find fog(6) .
8. Find the value of $\boldsymbol{\lambda}$, so that the vectors $\vec{a} = 3\hat{\imath} + 2\hat{\jmath} + 9\hat{k}$ and $\vec{b} = \hat{\imath} + \boldsymbol{\lambda}\hat{\jmath} + 3\hat{k}$ are perpendicular to each other .

9. If A' $=\begin{bmatrix} -2 & 3 \\ 1 & 2 \end{bmatrix}$ and B $=\begin{bmatrix} -1 & 0 \\ 1 & 2 \end{bmatrix}$, find [A+2B'] .

10.Write the Cartesian equation of the line $\vec{\imath} = (2\hat{\imath} + \hat{\jmath}) + \boldsymbol{\lambda}(\hat{\imath} - \hat{\jmath} + 4\hat{k})$.

11. If p(A) $=\frac{1}{2}$, p(B) = 0 ,then p $\left(\frac{A}{B}\right)$ is

(a) Zero (b) $\frac{1}{2}$ (c) Not defined (d) 1

12. If p(A) $=\frac{4}{5}$ and p(A $\cap$ B) $= \frac{7}{10}$, then p(B/A) is equal to

(a) $\frac{1}{10}$ (b) $\frac{1}{8}$ (c) $\frac{7}{8}$ (d) $\frac{17}{20}$

13. Let A and B are two events . If P(A)=0.2, P(B)=0.4, P(A$\cup$ B)=0.6,

then P(A/B) is equal to

(a)0.8 (b) 0.5 (c) 0.3 (d) 0

14. If P(A)= $\frac{3}{10}$, P(B)= $\frac{2}{5}$ and P(A$\cup$B)=$\frac{3}{5}$ then P(B/A)+P(A/B) equals to

(a) $\frac{1}{4}$ (b) $\frac{1}{3}$ (c) $\frac{5}{12}$ (d) $\frac{7}{12}$

15. $\int_1^{\sqrt{3}} \frac{1}{1+x^2}\, dx$ is

(a) $\frac{\pi}{3}$ (b) $\frac{2\pi}{3}$ (C) $\frac{\pi}{6}$ (d) $\frac{\pi}{12}$

16. $\int_0^{2/3} \frac{1}{4+9x^2}\, dx$ is equal to

(a) $\frac{\pi}{6}$ (b) $\frac{\pi}{12}$ (c) $\frac{\pi}{24}$ (d) $\frac{\pi}{4}$

17. The value of $\int_0^4 (x + e^{2x})\, dx$ is

(a) $\frac{15+e^8}{2}$ (b) $\frac{15-e^8}{2}$

(c) $\frac{e^8-15}{2}$ (d) $\frac{-e^8-15}{2}$

18. $\int_{\frac{-\pi}{4}}^{\frac{\pi}{4}} \frac{dx}{1+cos2x}$ is equal to

(a) 1 (b) 2 (c) 3 (d) 4

19. Evaluate $\int_2^3 3^x\,dx$.

20.Evaluate $\int_0^3 \frac{dx}{9+x^2}$.

21. If $\int_0^a \frac{1}{4+x^2}\,dx = \frac{\pi}{8}$, then find the value of a .

22 Find the projection of vector $\hat{\imath} + 3\hat{\jmath} + 7\hat{k}$ on vector $2\hat{\imath} - 3\hat{\jmath} + 6\hat{k}$

23 If the set A contain 5 element and set B contain 6 element, then the number of one one onto function from A to B

(a) 720 (b) 120 (c) 0 (d) None of these.

25. Evaluate $\cot(tan^{-1}a + cot^{-1}a)$

26 If $x = a(cos\theta + \theta sin\theta)$ $and\ y = a(sin\theta - \theta cos\theta)$ $\frac{dy}{dx}$ is equal to

(a)tan θ (b)cot θ (c) sin θ (d) cosθ

27. Which of the following function is decreasing on $\left(0, \frac{\pi}{2}\right)$?

(a) sin2x (b) cosx (c) tanx (d) cos3x

28 The linear inequalities or equation or restrictions on the Variables of a linear programming problem are called.

(a)Linear relation (b)constraints (c) Function(d)Objective function

29 Events A and B are such that P(A)=$\frac{1}{2}$, P(B)= $\frac{7}{12}$ and P(not A or not B). state whether A and B are Independent.

30 The degree of differential equation $\left(\frac{d^2y}{dx^2}\right)^3 + \left(\frac{dy}{dx}\right)^3 + sin\left(\frac{dy}{dx}\right) + 1 = 0$ is

(a) 3 (b) 2 (c) not defined (d) 1

31. For what positive value x ,the following determinants are equal $\begin{vmatrix} 2x & 3 \\ 5 & x \end{vmatrix} = \begin{vmatrix} 16 & 3 \\ 5 & 2 \end{vmatrix}$

32. The point at which the tangent to the curve $y = 2x^2 - x + 1$ is parallel to $y = 3x + 1$

(a) (2,1) (b) (1,2) (c) (3,9) (d)(-2,1)

33. Area bounded by curve $y = f(x)$ and the ordinate $x = a$ and $x = b$ is given by

(a) $\int_a^b f(x)dx$ (b) $\int_a^b xdx$ (c) $\int_a^b ydy$ (d) $\int_a^b dx$

34. Area bounded by the circle $x^2 + y^2 = a^2$ in the first quadrant is.

(a) πa^2 (b)$\frac{\pi a^2}{2}$ (c) $\frac{\pi a^2}{4}$

(d) None of these.

35. Area bounded by two curves $y = f_1(x)$ and $y = f_2(x)$ between the ordinate x=a and x=b is

(a) $\int_a^b f_1(x)dx$ (b)) $\int_a^b f_2(x)dx$ (c) $\int_a^b [f_1(x) + f_2(x)]dx$ (d) $\left|\int_a^b [f_1(x) - f_2(x)]dx\right|$

36. Area bounded by ellipse $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$ is

(a) πab (b) $\pi a^2 b^2$ (c) $\pi(a + b)$ (d) $\pi^2 ab$

37. The area of the region bounded by the curve $y = \sqrt{16 - x^2}$ and above x-axis is

(a) 8π sq. units (b)) 20π sq. units (c) 16π sq. units (d) 256π sq. units

38Using integration find the area bounded by line x=2 and parabola $y^2=8x$.

39 The value of c in Rolle,s theorem for the function $f(x) = x^3 - 3x$ in the interval $[0, \sqrt{3}i]$ is

(a) 1 (b)-1 (c) $\frac{3}{2}$ (d) $\frac{1}{2}$

40 A solution which contains as many arbitrary constants as order of differential equation is called ……

41If A is square matrix satisfying $A'A = I$ .Write the value of $|A|$.

42.If $|\hat{a}| = 2$, $|\hat{b}| = 7$ and $|\hat{a} \times \hat{b}| = 3\hat{\imath} + 2\hat{\jmath} + 6\hat{k}$ Find the angle between $\vec{a}$ and $\vec{b}$

DAV PUBLIC SCHOOL, BISHRAMPUR

CLASS: XII SUBJECT: MATHEMATICS

1. Set A has 3 elements and the set B has 4 elements. Then the number of injective mappings that can be defined from A to B is:

a) 144 b) 12 c) 24 d) 64

2. The domain of $\sin^{-1}2x$ is:

a) [0, 1] b) [-1, 1] c) [-1/2, 1/2] d) [-2, 2]

3. The greatest and least value of $(\sin^{-1}x)^2 + (\cos^{-1}x)^2$ are respectively :

a) $\frac{5\pi 2}{4}$ and $\frac{\pi 2}{8}$ b) $\frac{\pi}{2}$ and $-\frac{\pi}{2}$ c) $\frac{\pi 2}{4}$ and $-\frac{\pi 2}{4}$ d) $\frac{\pi 2}{4}$ and 0.

4. If A is a square matrix such that $A^2 = A$, then $(I + A)^3 - 7A$ is equal to :

a) A b) I - A c) I d) 3A

5. If $\begin{vmatrix} 2x & 5 \\ 8 & x \end{vmatrix} = \begin{vmatrix} 6 & -2 \\ 7 & 3 \end{vmatrix}$, then value of x is:

a) 3 b) ± 3 c) $\pm$ 6 d) 6

6. The value of 'c' in Rolle's Theorem for the function $f(x) = x^3 - 3x$ in the interval $[0, \sqrt{3}]$ is :

a) 1 b) -1 c) $\frac{3}{2}$ d) $\frac{1}{3}$

7. The value of 'c' in Mean Value Theorem for the function f(x) = x(x-2), in the interval [1, 2] is :

a) $\frac{3}{2}$ b) $\frac{2}{3}$ c) $\frac{1}{2}$ d) $\frac{3}{4}$

8. The interval in which $y = x^2e^{-x}$ is increasing with respect to x is :

a) $(-\infty, \infty)$ b) (-2, 0) c) $(2, \infty)$ d) (0, 2)

9. The two curves $x^3 - 3xy^2 + 2 = 0$ and $3x^2y - y^3 = 2$ cut at an angle :

a) $\frac{\pi}{2}$ b) π c) $\frac{\pi}{4}$ d) $\frac{\pi}{3}$

10. $\int_{-2}^{2} /x \cos \pi x/ \, dx$ is equal to :

a) $\frac{8}{\pi}$ b) $\frac{4}{\pi}$ c) $\frac{2}{\pi}$ d) $\frac{1}{\pi}$

11. $\int_0^{\pi} [\cot x] \, dx$, where [.] denote the greatest integer function, is equal to :

a) $\frac{\pi}{2}$ b) 1 c) -1 d) $-\frac{\pi}{2}$

12. The area enclosed by the ellipse $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$ is equal to :

a) $\pi^2 ab$ b) πab c) $\pi a^2 b$ d) $\pi a b^2$

13. The area of the region bounded by the curve $y = x^2$ and the line y = 16 is :

a) $\frac{32}{3}$ b) $\frac{256}{3}$ c) $\frac{64}{3}$ d) $\frac{128}{3}$

14. The number of arbitrary constants in the particular solution of a differential equation of fourth order is:

a) 0 b) 2 c) 3 d) 4

15. The solution of the differential equation: $2x \frac{dy}{dx} - y = 3$ represents a family of:

a) straight lines b) circles c) parabolas d) ellipses.

16. The value of λ for which two vectors $2i - j + 2k$ and $3i + \lambda j + k$ are perpendicular is :

a) 2 b) 4 c) 6 d) 8

17. The length of the perpendicular drawn from the point (3, -1, 11) to the line $\frac{x}{2} = \frac{y-2}{3} = \frac{z-3}{4}$ is:

a) $\sqrt{29}$ b) $\sqrt{33}$ c) $\sqrt{53}$ d) $\sqrt{65}$

18. The distance of the point (1, -5, 9) from the plane x-y +z = 5, measured along a straight line: x = y = z is:

a) $10\sqrt{3}$ b) $5\sqrt{3}$ c)3 $\sqrt{10}$ d) 3 $\sqrt{5}$

19. The distance between two parallel planes: 2x +y + 2z = 8 and 4x + 2y + 4z +5 = 0 is:

a) $\frac{5}{2}$ b) $\frac{7}{2}$ c) $\frac{9}{2}$ d) $\frac{3}{2}$

20. Probability that a speaks truth is $\frac{4}{5}$. A coin is tossed. A reports that a head appears. The probability that actually there was head is :

a) $\frac{4}{5}$ b) $\frac{1}{2}$ c) $\frac{1}{5}$ d) $\frac{3}{5}$

21. Write fog, if f: R$\rightarrow R$ and g: R$\rightarrow R$ are given by $f(x) = 8x^3$ and $g(x) = x^{1/3}$.

22. If R = {(x, y): x + 2y = 8} is relation on N, then write the range of R.

23. Find the principal value of : $\tan^{-1}(\sqrt{3}) - \cot^{-1}(-\sqrt{3})$.

24. If $\tan^{-1}x + \tan^{-1}y = \frac{\pi}{4}$, xy <1, then write the value of x +y + xy.

24. Write the number of all possible matrices of order 2 X 2 with each entry 1,2 and 3.

25. If $\begin{bmatrix} x-y & z \\ 2x-y & w \end{bmatrix} = \begin{bmatrix} -1 & 4 \\ 0 & 5 \end{bmatrix}$, then find the value of x + y.

26. If A is square matrix of order 3 and I3AI = k IAI, then write the value of k.

27. If A is square matrix satisfying A'A = I, write the value of IAI.

28. If A and B are square matrices of of the same order 3, such that IAI = 2 and AB = 2I. write the value of IBI.

29. If f(x) = x+1, find $\frac{d}{dx}$(fof)x.

30. If y = x IxI, find $\frac{dy}{dx}$ for x<0.

31. Evaluate $\int \frac{(1+logx)^2}{x}$ dx

32. Given, $\int e^x(\tan x + 1)\sec x\,dx$ = e^x f(x) + C. Write f(x) satisfying above.

33. Write the anti-derivative of $(3\sqrt{x} + \frac{1}{\sqrt{3}})$.

34. Find the area of region bounded by the y-axis, y = cos x and y = sin x, $0 \leq x \leq \frac{\pi}{2}$.

35. write the solution of differential equation $\frac{dy}{dx}$ = x^3e^{-2y}.

36. Write the integrating factor of the following differential equation.

$(1 + y^2) + (2xy - \cot y)\frac{dy}{dx} = 0$.

37. Write the solution of differential the following equation

$\cos(\frac{dy}{dx}) = a$, ($a \in R$).

38. Write the projection of the vector I + j +k along the vector j.

39. If I$\vec{a}$ I = 8, I I$\vec{b}$ I = 3 and I$\vec{a} \times \vec{b}$I = 12, find the angle between $\vec{a}$ and $\vec{b}$.

40. what are the direction cosines of a line which makes equal angles with the coordinate axes?

41. Find the distance of the point (2, 3, 4) from X-axis.

42. If a line has direction ratios (2, -1, -2) then what are its direction cosines?

43. write the equation of the straight line through the point (α, β, γ) and parallel to Z- axis.

44. If a line makes angles 90°, 60° and θ with X, Y and Z axes respectively, where θ is acute angle, then find θ.

45. If P(not A) = 0.7, P(B) = 0.7 and P(B/A) = 0.5, then find P(A/B).

46. A black and a red die are rolled together. Find the conditional probability of obtaining the sum 8, given that the red die resulted in a number less than 4.

47. A bag A contains 4 green and 3 red balls and bag B contains 4 red and 3 green balls. One bag is taken at random and a ball is drawn and noted to be green. Find the probability that it comes from bag B.

48. Two dice are thrown n times in succession. Find the probability of obtaining a double six at least once.

49. Write 2X2 matrix which is both symmetric and skew- symmetric.

50. Evaluate $\int_{-\pi/2}^{\pi/2} sin^5x\,dx$.

DAV PS, PANDAVPARA

OBJECTIVE TYPE QUESTIONS : 2019-20

CLASS – XII **SUBJECT- MATHEMATICS**

Q1.Given set A = {1, 2, 3} and a relation R = {(1, 2), (2, 1)}, the relation R will be-

a) reflexive if {1, 1) is added
b) symmetric if {2, 3) is added
c) transitive if {1, 1) is added
d) symmetric if {3, 2) is added

Q2. Let Z be the set of integers and R be a relation defined in Z such the aRb if (a-b) is divisible by 5. Then R

partitions the set Z into _____ pairwise disjoint subsets.

Q3. Consider set A = {1, 2, 3} and the relation R = {(1, 2)}, the R is a transitive relation. State true or false.

Q4. Set A has 3 elements and the set B has 4 elements. Then the number of injective functions that can be defined from set A to B is-

a) 144 b) 12 c) 24 d) 64

Q5. Principal value of $\sin^{-1}\left(-\frac{1}{2}\right)$ is –

a) $\frac{\pi}{3}$ b) $-\frac{\pi}{3}$ c) $\frac{5\pi}{6}$ d) $-\frac{\pi}{6}$

Q6. $\sin^{-1}\left(\sin\frac{2\pi}{3}\right) = \frac{2\pi}{3}$, state true or false.

Q7. If $3\sin^{-1}x + \cos^{-1}x = \pi$, the x is equal to –

a) 0 b) $\frac{1}{\sqrt{2}}$ c) -1 d) $\frac{1}{2}$

Q8. If $\cos(\tan^{-1}x + \cot^{-1}\sqrt{3}) = 0$, then value of x is _____.

Q9. Total number of possible matrices of order 2 x 3 with each entry 1 or 0 is –

a) 6 b) 36 c) 32 d) 64

Q10. If $A = \begin{bmatrix} 0 & a \\ 0 & 0 \end{bmatrix}$, then A^{16} is _____ matrix.

Q11. If A and B are symmetric matrices, then AB – BA is a _____ matrix.

Q12. Let A be a square matrix of order 2 x 2, then $|KA|$ is equal to –

a) $K|A|$ b) $K^2|A|$ c) $K^3|A|$ d) $2K|A|$

Q13. A and B are invertible matrices of the same order such that $[(AB)^{-1}] = 8$, if [A]=2, then [B] is –

a) 16 b) 4 c) 6 d) $\frac{1}{16}$

Q14. A function f is said to be continuous for $x \in R$, if –

a) It is continuous at x = 0
b) Differentiable at x = 0
c) Continuous at points
d) Differentiable for $x \in R$

Q15. The function $f(x) = \frac{x+1}{1+\sqrt{1+x}}$ is continuous at x = 0, if f(0) is _____.

Q16. A function $f(x) = \frac{x}{x-5}$, $x \in R$, is a continuous function. State true or false.

Q17. If y = log (tan x) + log (cot x), then $\frac{dy}{dx}$ is _____.

Q18. If $f(x) = 9x^{2+2x}$, then f'(-1) is _____.

Q19. The derivative of sin x with respect to log x is –

a) cos x b) x cos x c) $\frac{\cos x}{\log x}$ d) $\frac{1}{x\cos x}$

Q20. The edge of a cube is increasing at the rate of 0.3 cm/s, the rate of change of its surface area when edge is 3 cm is_____.

Q21. The line y = x + 1 is a tangent to the curve $y^2 = 4x$ at the point –

a) (-1, 2) b) (1, 2) c) (1, -2) d) (2, 1)

Q22. If $\int sec^2(7-4x)\,dx$ = a tan (7-4x) + C, then value of a is –

a) 7 b) -4 c) 3 d) $-\frac{1}{4}$

Q23. The value of λ for which $\int \frac{4x^3+\lambda 4^x}{4^x+x^4}\,dx = \log[4^x + x^4]$ is -

a) 1 b) $\log_e 4$ c) $\log_4 e$ d) 4

Q24. The value of $\int_0^{\pi} |\cos x|\,dx$ is 2. State true or false.

Q25. The area of the region bounded by the curve $y = \frac{1}{x}$, the x – axis and between x = 1 to x = 6 is _____.

Q26. The degree of differential equation $\frac{dy}{dx} + \sin\left(\frac{dy}{dx}\right) = 0$ is not defined. State true or false.

Q27. The order of the differential equation of all the circles of given radius 4 is –

a) 1 b) 2 c) 3 d) 4

Q28. Mathematically a vector is defined as a" directed line segment". State true or false.

Q29. The distance of point (2, 5, 7) from the x axis is –

a) 2 b) $\sqrt{74}$ c) $\sqrt{29}$ d) $\sqrt{53}$

Q30. A line makes angles $\propto, \beta, \gamma$ with x – axis, y – axis and z – axis respectively, then cos 2α + cos 2β + cos 2γ is

equal to –

a) 2 b) 1 c) -2 d) -1

Q31. A line makes angles $\propto, \beta, \gamma$ with z – axis, x – axis, y – axis respectively. Then direction cosines of line are cos β,

cos γ, cos α. State true or false.

Q32. The equations of y – axis in space are –

a) x = 0, y = 0 b) x = 0, z = 0 c) y = 0, z = 0 d) y = 0

Q33. Of all the points of the feasible region, for maximum or minimum of objective function, the point lies-

a) inside the feasible region
b) at the boundary line of the feasible region
c) vertex point of the boundary of the feasible region
d) none of these

Q34. Feasible region is the set of points which satisfy –

a) the objective functions
b) sum of the given constraints
c) all of the given constraints
d) none of these

Q35. Let A and B be two given mutually exclusive events. Then P(A/B) is_____.

Q36. 3 persons A, B and C, fire a target in turn. Their probabilities of hitting the target are 0.2, 0.3 and 0.5 respectively, the probability the target hit is _____.

Q37. If A and B are independent events, then P(A and B) = P(A) + P(B). State true or false.

Q38. Three balls are drawn from a bag containing 2 red and 5 black balls, if the random variable X represents the

number of red balls drawn, then X can take values-

a) 0, 1, 2 b) 0, 1, 2, 3 c) 0 d) 1, 2

Q39. The value of k, for which the following distribution is a probability distribution.

X	30	10	-10
P(X)	1/5	3/10	k

is _____.

Q40. The area of a parallelogram whose one diagonal is 2 $\hat{\imath}$ + $\hat{\jmath}$ - 2$\hat{k}$ and one side is 3 $\hat{\imath}$ + $\hat{\jmath}$ - $\hat{k}$ is -

a) $\hat{\imath}$ - 4 $\hat{\jmath}$ - $\hat{k}$ b) 3$\sqrt{2}$ sq. units c) 6$\sqrt{2}$ sq. units d) 6 sq. units