**KENDRIYA VIDYALAYA, KAVARATTI 682555 (U.T. of Lakshadweep)**

MCQS CLASS 12

# MULTIPLE CHOICE QUESTIONS FROM XII CLASS

1. If $3\tan^{-1}x + \cot^{-1}x = \pi$ then x equals

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

2. If $P(A \cap B) = \frac{7}{10}$ $P(B) = \frac{17}{20}$ then P (A/B ) equals

(a) $\frac{14}{17}$ $(b)$ $\frac{17}{20}$ (c) $\frac{7}{8}$ (d) $\frac{5}{8}$

3. The reflection of the point ( 1,-2,3 ) in the XY- plane is

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

4. Area of the region bounded by the curve y = cos x , between x= 0 and $x = \pi$ is

(a ) 2 sq units (b) 4 sq units (c) 3 sq units Type equation here. (d) 1 sq units

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

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

6. The planes 2x- y+ 4z = 5 and 5x-2.5 y + 10 z = 6 are

(a) perpendicular (b) parallel (c) intersect y axis (d) passes through (0,0, $\frac{5}{4}$ )

7.The vector in the direction of the vector $\hat{\imath} - 2\hat{\jmath} + 2\hat{k}$ that has magnitude 9 is

(a ) $\hat{\imath} - 2\hat{\jmath} + 2\hat{k}$ (b) $\frac{\hat{\imath} - 2\hat{\jmath} + 2\hat{k}}{3}$

(c) $3(\hat{\imath} - 2\hat{\jmath} + 2\hat{k})$ (d) $9(\hat{\imath} - 2\hat{\jmath} + 2\hat{k})$

8.If $x = t^2$ and $y = t^3$, then $\frac{dy}{dx}$ is

(a) $\frac{3}{2}t$ (b) $\frac{2}{3}t$ $\frac{3}{2t}$ $\frac{3t}{2}$

9 The area of the quadrilateral ABCD where A (0,4,1 ), B (2,3,-1 ), C (4,5,0 ) and D ( 2,6,2 ) is equal to

(a) 9 sq units (b) 18 sq units (c) 27 sq units (d) 81 sq units

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MCQS CLASS 12

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

(a) 8 $\pi$ sq units (b)20 $\pi$ sq units (c) 16 $\pi$ sq units (d ) 256 $\pi$ sq units

……

CLASS-12 BIOLOGY MCQ

1. Residual persistent nucleus
a.pericarp , b.germ pore, c.hilum d. perisperm
2.Fusion of male and female gamete is called as
a.Double fertilization ,b.Triple fusion, c. Syngamy
d.Artificial hybridization
3.After ovulation the remaining pars of the Graffian follicle transform into-----.
a.Ovum, b.Corpus luteum,c.Embryo,d. Blastula.

4.A foetal sex determination test based on the chromosomal pattern in the amniotic fluid surrounding the embryo is----------.
a.Invitro fertilisation, b.Invivofertilisation,c.Amniocentesis,d.None of these.

5.The genetic disorder----------is caused due to the presence ofan additional copy of X-chromosome resulting in to a karyotype of 47XXY.
a. Turners Syndrome,b.Down's syndrome,c.Klinefelter's syndrome,
d.Haemophila.
6.---------- is a quick way to compare the DNA sequences of any two individuals.
a. Human Genome project, b.DNA fingerprinting, c.Bioinformatics,
d.None of these.
7.The process of evolution of different species in a given geographical area starting from a point and literally radiating into other areas of geography is---.
a. Industrial melanism, b. Saltation, c.Adaptive radiation,d.None of these.

8.The WIDAL test confirms ---------disease.
a. Typhoid, b. AIDS, c. Caner, d.Malaria.

9.The programe for herd improvement in a short time is ----------.
a.Out breeding, b. MOET, c.Hybridisation, d.Inbreeding.

10.Baculoviruses used as biocontrol agent is an example for----------.

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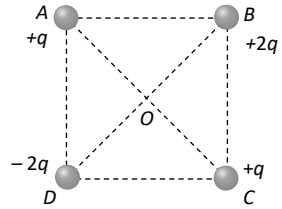
MCQS CLASS 12

a.Biofertiliser, b.Weedicide, c.Biopesticide, d.Organic farming.

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CLASS-12 PHYSICS MCQ

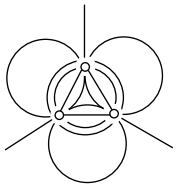
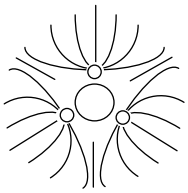
1. Four charges are arranged at the corners of a square $ABCD$ , as shown in the adjoining figure. The force on the charge kept at the centre *O* is

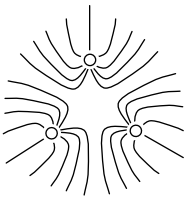
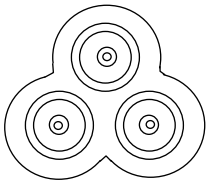



(a) Zero (b) Along the diagonal $AC$

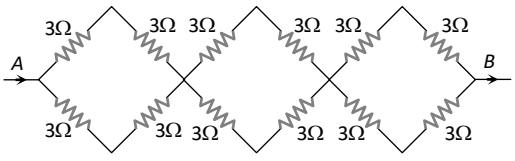
(c) Along the diagonal $BD$ (d)Perpendicular to side $AB$

2. Three positive charges of equal value *q* are placed at the vertices of an equilateral triangle. The resulting lines of force should be sketched as in

(a)  (b) 

(c)  (d) 

3. In the network of resistors shown in the adjoining figure, the equivalent resistance between *A* and *B* is




(a) 54 *ohm* (b) 18 *ohm*

(c) 36 *ohm* (d) 9 *ohm*

4. Two electric bulbs whose resistances are in the ratio of 1 : 2 are connected in series. The powers dissipated in them have the ratio

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

5. One requires energy $E_n$ to remove a nucleon from a nucleus and an energy $'E_e'$ to remove an electron from the orbit of an atom. Then

(a) $E_n = E_e$ (b) $E_n < E_e$

(c) $E_n > E_e$ (d) $E_n \geq E_e$

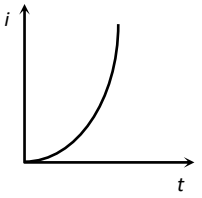
6. The ratio of momenta of an electron and an $\alpha-$ particle which are accelerated from rest by a potential difference of 100 *V* is

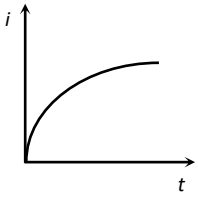
(a) 1 (b) $\sqrt{\frac{2m_e}{m_\alpha}}$ (c) $\sqrt{\frac{m_e}{m_\alpha}}$ (d) $\sqrt{\frac{m_e}{2m_\alpha}}$

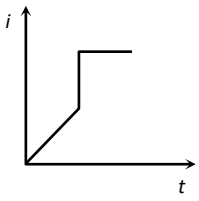
7. A coil of inductance L has an inductive reactance of $X_L$ in an AC circuit in which the effective current is *I*. The coil is made from a super-conducting material and has no resistance. The rate at which power is dissipated in the coil is

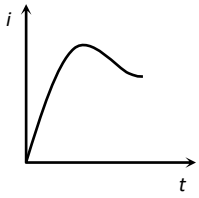
(a) 0 (b) $IX_L$ (c) $I^2X_L$ (d) $IX_L^2$

8. When a battery is connected across a series combination of self inductance *L* and resistance *R*, the variation in the current *i* with time *t* is best represented by **[MP PET 2004]**

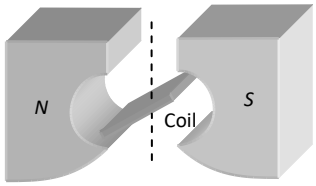
(a) 


(b) 


(c) 


(d) 


9. The figure below shows the north and south poles of a permanent magnet in which *n* turn coil of area of cross-section *A* is resting, such that for a current *i* passed through the coil, the plane of the coil makes an angle $\theta$ with respect to the direction of magnetic field B. If the plane of the magnetic field and the coil are horizontal and vertical respectively, the torque on the coil will be



MCQS CLASS 12

(a) $\tau = niAB\cos\theta$

(b) $\tau = niAB\sin\theta$

(c) $\tau = niAB$

(d) None of the above, since the magnetic field is radial

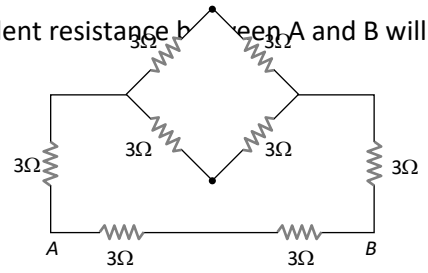
10. Equivalent resistance between A and B will be

(a) 2 *ohm*

(b) 18 *ohm*

(c) 6 *ohm*

(d) 3.6 *ohm*



# CLASS- XII –MATHS MCQ

Q1) The plane 2x-y+4z=5 and 5x-215y+10z=6 are?

a)perpendicular b)parallel c)pass through (0,0)

Q2) The area Bounded by the curve $y=x^3$ ,the x axis and ordinates x=-2 and x=1 is ?

Q3) vector equation of the curve through the axis(3,4,-7) and (1,-1,6) is ?

Q4) order of the differential equation

$3x^2 d^2y/dx^2 -5dy/dx +y=0$

Q5) integrate $\sin^{-1}(\cos x)dx$

Q6) Let A be a skew symmetric matrix of odd oder , then |A| is equal to?

a)0 b)1 c)-1 d)none of these

Q7)In the interval (-3,3), the function f(x)=x/3 +3/x is

a) Decreasing b) increasing c)neither increasing or decreasing d)none of these

Q8) Find the distance between the parallel planes r.(2i-j+3j)=4 and

(6i-3j+9k)+13=0?

Q9)If the feesible region for a LPP is……. Then the opitimal value of the objective functions Z=ax+by by may or may not exist.

Q10)prove that the right circular cone of maximum volume which can be inscribed in a sphere of radius r has altitude equal to 4r/3 and show that the ,max volume is 8/24 of the volume of a sphere.?

***OBJECTIVE TYPE QUESTIONS***

1.If A is an mxn matrix then A' is

a)mxn b)nxm c)mxm d)nxn

2.A Relation from A to B is an arbitrary subset of:

a) AxB b) BxB c)AxA d)BxB

3.The principal value of $\cot^{-1}(-1)$ is

a) $\frac{\pi}{4}$ b) $-\frac{\pi}{6}$ c)$-\frac{\pi}{4}$ d) $\frac{\pi}{6}$

4.$\tan^{-1}\frac{1}{2} + \tan^{-1}\frac{1}{3}$ is equal to

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

5.If x=a sin2t(1+cos 2t) and y=b cos2t(1-cos2t),then the value of $\frac{dy}{dx}$ at t=$\frac{\pi}{4}$ is

a) $\frac{a}{b}$ b) $\frac{b}{a}$ c)$ab$ d) a+b

6.The slope of the tangent to the curve given by x=1-cos$\theta$ , y=$\theta - sin\theta$ $at$ $\theta = \frac{\pi}{2}$

a)0 b)-1 c)1 d)$\sqrt{3}$

7.A straight line makes angle of $60^0$ with each of x-axis and y-axis .With z-axis it makes an angle of

a)$30^0$ b)$45^0$ c)$60^0$ d)$90^0$

8.A perpendicular PM is drawn from the point P(1,2,3) on XY plane.The coordinates of the foot of the perpendicular M are

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

9.if 2x+5y-6z+3=0 be the equation of the plane,then the equation of the plane parallel to the given plane is

a)3x+5y-6z+3=0

b)3x-5y-6z+3=0

c)2x+5y-6z+k=0

d)4x+10y-6z+3=0

10.If P(A) = $\frac{3}{8}$ , P(B) = $\frac{1}{2}$ and P(A∩ $B$) = $\frac{1}{4}$ then P(A'/B') =

a) $\frac{1}{4}$ b) $\frac{1}{3}$ c) $\frac{3}{4}$ d) 3 $\frac{3}{8}$

**KENDRIYA VIDYALAYA ADOOR SHIFT 2**
**MATHEMATICS XII**

1)Let f:R → R be the function defined by $f(x) = x^3 + 5$.Then the function $f^{-1}(x)$ is:
a)$(x+3)^{1/3}$ b)$(x-5)^{1/3}$ c)$(5-x)^{1/3}$ d)5-x
Ans: b

2)Which among the following is an intersecting point of the two functions y=Ix-1I and y=3-IxI
a)(1,2) b)(1,-2) c)(3,0) d)(-1,2)
Ans: d

3)The integrating factor of the differential equation $\frac{dy}{dx}x - y = 2x^2$ is
a) $e^{-x}$ b)-1/x c) 1/x d) $x^2$
4)If $\bar{a}$ and $\bar{b}$ are two unit vectors such that $\bar{a} + \bar{b}$ is also a unit vector then the angle between $\bar{a}$ and $\bar{b}$ is :
a)$\frac{\pi}{3}$ b)$\frac{2\pi}{3}$ c)$\frac{\pi}{6}$ d)$\frac{3\pi}{4}$
Ans: b

5) The line x=1 ,y=2 is
a) parallel to X axis b) parallel to Y axis c) parallel to Z axis d) lies in a plane parral to XY plane
Ans: c

6) Let P(A) =7/13 ,P(B) =9/13 and $P(A \cap B) = 4/13$ then $P(A^1/B)$ equal to :
a)6/13 b)4/13 c)4/13 d)5/9
Ans:d

7) If x ,y, z are all different from zero

and $\begin{vmatrix} 1+x & 1 & 1 \\ 1 & 1+y & 1 \\ 1 & 1 & 1+z \end{vmatrix}$ = 0 , then the value of $x^{-1}+y^{-1}+z^{-1}$ is

a)xyz b)$x^{-1}y^{-1}z^{-1}$ c)-x-y-z d)-1

Ans d

8) The function f(x) = x has

a) only one maximamb) only one minimum c)one maximum and one minimum

d)no extreme value

Ans: d

9)Ifthe curve ay+ $x^2$= 7 and $x^3$ = y cut orthogonally at (1,1 ) then value of a is

a) -6 b)6 c)1 d)none of these

Ans b

10) The set of points where the function given by f(x) = I2x-1Isinx is differentiable is

a)Rb)R- {1/2) c)(0, ∞ ) d) none of these.

Ans)b

***OBJECTIVE TYPE QUESTIONS***

1.If A is an mxn matrix then A' is

a)mxn b)nxm c)mxm d)nxn

2.A Relation from A to B is an arbitrary subset of:

a) AxB b) BxB c)AxA d)BxB

3.The principal value of $\cot^{-1}(-1)$ is

a) $\frac{\pi}{4}$ b) $-\frac{\pi}{6}$ c)$-\frac{\pi}{4}$ d) $\frac{\pi}{6}$

4.$\tan^{-1}\frac{1}{2} + \tan^{-1}\frac{1}{3}$ is equal to

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

5.If x=a sin2t(1+cos 2t) and y=b cos2t(1-cos2t),then the value of $\frac{dy}{dx}$ at t=$\frac{\pi}{4}$ is

a) $\frac{a}{b}$ b) $\frac{b}{a}$ c)$ab$ d) a+b

6.The slope of the tangent to the curve given by x=1-cos$\theta$ , y=$\theta - sin\theta$ $at$ $\theta = \frac{\pi}{2}$

a)0 b)-1 c)1 d)$\sqrt{3}$

7.A straight line makes angle of $60^0$ with each of x-axis and y-axis .With z-axis it makes an angle of

a)$30^0$ b)$45^0$ c)$60^0$ d)$90^0$

8.A perpendicular PM is drawn from the point P(1,2,3) on XY plane.The coordinates of the foot of the perpendicular M are

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

9.if 2x+5y-6z+3=0 be the equation of the plane,then the equation of the plane parallel to the given plane is

a)3x+5y-6z+3=0

b)3x-5y-6z+3=0

c)2x+5y-6z+k=0

d)4x+10y-6z+3=0

10.If P(A) = $\frac{3}{8}$ , P(B) = $\frac{1}{2}$ and P(A∩ $B$) = $\frac{1}{4}$ then P(A'/B') =

a) $\frac{1}{4}$ b) $\frac{1}{3}$ c) $\frac{3}{4}$ d) 3 $\frac{3}{8}$

**KENDRIYA VIDYALAYA RAMAVARMAPURAM**

MCQ QUESTIONS OF CLASS XII MATHEMATICS

Q1. The value of $\int_0^1 \tan^{-1}\left(\frac{2x-1}{1+x-x^2}\right)dx$ is

a) 1 b) 0 c) -1 d)π/4

***Ans:- b)0***

Q2. The probability of obtaining an even prime number on each dies, when a pair of dice rolled is

a) 0 b) 1/3 c) 1/12 d)1/36

***Ans:- d)1/36***

Q3. If A= $\begin{bmatrix} cos\alpha & -sin\alpha \\ sin\alpha & cos\alpha \end{bmatrix}$ and A+A'=I, then find the value of $\alpha$

a)π/6 b)π/3 c)π/2 d)0

***Ans:- b)π/3***

Q4. Find the value of c in Rolle's theorem for the function $f(x)=x^3-3x$ in $[-\sqrt{3},0]$

a)1 b)-1/2 c)-1 d)-1/3

***Ans:-c) -1***

Q5. .Let R be the relation on R defined by R = { (a,b) : a,b∈ R and $a-b+\sqrt{3} \in$ irrational number} is

a)Refexive but not symmetric

b)symmetric but not transitive

c)Refexive and symmetric but not transitive

d) An equivalence relation

***Ans:-d) An equivalence relation***

Q6. If f(x) = x + 7 and g(x) = x – 7, x∈**R**, find $f \circ g(7)$

a) 0

b) 7

c) -7

d) None of these

***Ans:- b) 7***

Q7. Let A={1,2,3}. Then the number of relations containing (1,2) and (1,3) which are reflexive and symmetric but not transitive is

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

***Ans:-a) 1***

Q8. Let N be the set of natural numbers and R be the relation in N defined as

R = {(a, b) : a = b – 2, b > 6}. Then which of the following is correct?

(a) (2, 4) ∈ R

(b) (3, 8) ∈ R

(c) (6, 8) ∈ R

(d) (8, 7) ∈ R.

***Ans:- (c) (6, 8) ∈ R***

Q9. Find the product of the order and degree of the following differential equation

$x\left(\frac{d^2y}{dx^2}\right)^2+\left(\frac{dy}{dx}\right)^2+y^2=0$

a)2 b)1 c)4 d)0

***Ans:- (c)4***

***Q10.*** Find the value of $\tan\tan^{-1}\sqrt{3}$ -$\cot^{-1}-\sqrt{3}$

a)π/2 b)-π/2 c)π/6 d)-π/6

***Ans:- b)-π/2***

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# MULTIPLE CHOICE QUESTIONS

## CLASS XII MATHEMATICS

1. Distance between two planes: 2x + 3y + 4z = 4 and 4x + 6y + 8z = 12 is

   a) 2 units b) 4 units c) 8 units d) $\frac{2}{\sqrt{29}}$ units

2. Let f:R→R be defined as f(x)=3x. Choose the correct answer

   a) f is one-one onto b) f is many one onto
   c) f is one – one but not onto d) f is neither one-one nor onto

3. The value of $\int_0^{\frac{\pi}{2}} \log(\frac{4+3sinx}{4+3cosx})dx$ is

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

4) $\int \frac{e^x(1+x)}{cos^2(e^x x)}dx$ equals to

   a) $\tan(e^x)$ + c b) $\cot(e^x)$ + c c) $\tan(xe^x)$ + c d) - $\cot(e^x)$ + c

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

6. For what value of $\lambda$ , the matrix $\begin{bmatrix} \lambda+1 & 4 \\ 3 & 2 \end{bmatrix}$ is singular

   a) -1 b) 5 c) 0 d) -5

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

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

8. The corner points of the feasible region determined by the following system of linear inequalities: 2x + y ≤ 10, x + 3y ≤ 15, x, y ≥ 0 are (0,0), (5,0), (3,4), (0,5). Let Z= px + qy, where p,q > 0. Condition on p and q so that the maximum of Z occurs at both (3,4) and (0,5) is

   a) p = q b) p = 2q c) p = 3q d) q = 3p

9. The probability of obtaining an even prime number on each dies, when a pair of dice rolled is

   a) 0 b) 1/3 c) 1/12 d) 1/36

10. Suppose two cards are drawn at random from a deck of 52 cards. Let X be the number of aces obtained. Then the value of E(X) is

a) 37/221 b) 5/13 c) 1/13 d) 18/221

11.If y= lg($\frac{1-x^2}{1+x^2}$) then $\frac{dy}{dx}$ is equal to

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

12. The slope of the tangent to the curve x = $t^2 + 3t - 8$ and y= $2t^2$ - 2t -5 at ( 2,-1) is

a ) $\frac{22}{7}$ b) $\frac{6}{7}$ c) $\frac{-6}{7}$ d) -6

13. The derivative of $\cos^{-1}(2x^2 - 1)$with respect to $\cos^{-1} x$ is

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

14. The order and degree of the differential equation $\frac{d^2y}{dx^2}$ + $(\frac{dy}{dx})^{\frac{1}{4}}$ + $(x)^{\frac{1}{5}}$ = 0 respectively are

a) 2 and not defined b) 2 and 2 c) 2 and 3 d) 3 and 3

15.The rate of change ofarea of a circle with respect to its radius r at r=6 is

a)10π b)12π c)11π d)8π

**KENDRIYA VIDYALAYA KALPETTA**

**MCQ - CLASS XII**

**MATHEMATICS**

1. If f:R→R be the function defined by f(x) = $x^3$ +5 , then $f^{-1}$(x) is

   a. $(x+5)^{\frac{1}{3}}$ b. $(x-5)^{\frac{1}{3}}$ c. $(5-x)^{\frac{1}{3}}$ d.5-x

2. If there are two values of a which makes determinant, $\Delta = \begin{vmatrix} 1 & -2 & 5 \\ 2 & a & -1 \\ 0 & 4 & 2a \end{vmatrix} = 86$, then the sum of these number is

   a.4 b.5 c.-4 d.9

3. $\begin{bmatrix} 2x+y & 4x \\ 5x-7 & 4x \end{bmatrix} = \begin{bmatrix} 7 & 7y-13 \\ y & x+6 \end{bmatrix}$,then the value of x+y is

   a.-5 b.5 c.6 d.7

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

   a.π/5 b.2π/5 c.3π/5 d.π

5. $\int_0^{\pi/4} \cos x e^{\sin x} dx$ is equal to

   a.e+1 b.e-1 c.e d.-e

6. The area of the region bounded by the curve y=x+1 and the line x = 2, and x=3 is

   a.7/2 b.9/2 c.11/2 d.13/2

7. The order and degree of differential equation $\left[1+\left(\frac{dy}{dx}\right)^2\right] = \frac{d^2y}{dx^2}$ is

   a.(2,3/2) b.(2,3) c.(2,1) d.(3,4)

8. The value of λ for which the vectors $3\hat{i} - 6\hat{j} + \hat{k}$ and $2\hat{i} - 4\hat{j} + \lambda\hat{k}$ are parallel is

   a.2/3 b.3/2 c.5/2 d.2/5

9. The distance of the plane $\vec{r}(\frac{2}{7}\hat{i} + \frac{3}{7}\hat{j} - \frac{6}{7}\hat{k}) = 1$ from the origin is

   a.1 b.7 c.1/7 d.none of these

10. For the following probability distribution

| X | -4 | -3 | -2 | -1 | 0 |
|---|---|---|---|---|---|
| P(X) | 0.1 | 0.2 | 0.3 | 0.2 | 0.2 |

E(X) is equal to

a.0 b.-1 c.-2 d.-1.8

Answer

1.b 2.c 3.b 4.a 5.b 6.a 7.c 8.a 9.a 10.d

# MULTIPLE CHOICE QUESTIONS

# CLASS XII

# SUBJECT MATHEMATICS - Prepared By- Mrs.Beena V(PGT-Maths)

1) If $f(x) = 27x^3$ and $g(x) = x^{1/3}$ then $fog(7) =$

a) 0 b)x c) 7 d)none of these

2) $\cos^{-1}\cos\left(7\frac{\Pi}{6}\right)$

a) 7∏/6 b) 5∏/6 c) $\frac{\Pi}{3}$ d) ∏/6

3) cot $(\sin^{-1} x + \sec^{-1} x)$

a) 1 b) 0 c) not defined d) -1

4) If $|\vec{a} \times \vec{b}| = 4$, $\vec{a}.\vec{b} = 2$, then $|\vec{a}|^2 |\vec{b}|^2 =$

(a) 6 (b) 2 (c) 20 (d) 8

5) If A is any square matrix of order 3x3 , |A| =3 then the value of |adjA | is

a)3 b)9 c)27 d) 1/3

6) If A and B are two events such that P(A) =.2 ,P(B)=.4 and P(AUB) = .5 ,find the value of P(A/B)

a)) 0.1 b) 0.25 c)0.5 d)0.08

7) $\int e^x (1 + tanx) secx\, dx$ is

a) secx+c b) $e^x$secx +c c)$e^x$ tanx +c d) tanx+c

8) The point satisfying inequation 2x+y≤ 4 is

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

9) The direction cosines of y-axis are

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

10)The probability of 53 Sundays in a leap year is

a) 1/7 b)2/7 c)1 d)3/7

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# M CQ FOR CLASS XII MATHEMATICS 2020 (Prepared by- Mrs. K P Jyolsna –PGT-Maths)

## SET 2

1) cot $(\sin^{-1} x + \sec^{-1} x)$

a) 1 b) 0 c) not defined d) -1

2 ) $\left((\hat{i}+\hat{j})\times(\hat{j}+\hat{k})\right)(\hat{k}+\hat{i}) =$

(a) 0 (b) 1 (c) 2 (d) None of these

3) $\int_1^2 e^x \left(\frac{1}{x} - \frac{1}{x^2}\right)$ dx is

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

4) If A and B are two independent events such that P(A) =1/7 , P(B) =1/6 ,P(A'∩B') is

a) 1/42 b) 5/7 c) 1/7 d) none of these

5) IF matrix A and B are inerse of each other then

a)AB=BA b) AB=BA=I c) AB=BA=O d) AB=O,BA=I

6.The value of b for which the function f(x) = $\begin{cases} 5x-4, & 0<x\leq 1 \\ 4x^2+3bx, & 1<x<2 \end{cases}$ is continuous at every point of its domain is

(a) -1 (b) 0 (c) 13/3 (d) 1

7. If f$(x)$= $|x|$ $and$ $g(x)$= $|5x-2|$ then $(gof)$(-3) is

a) 4 b) 6 c) 13 d) none of these.

8. Sum of order and degree of differential equation $(y''')^2+(y'')^3+(y')^4+y^5=0$ is

(a) 5 (b) 8 (c) 7 (d) cannot be determined

9. If A be any invertible matrix such that $A^3$ = I then $A^{-1}$= .....

(a) I (b) $A^2$ (c) $A^3$ (d) $A^4$

10 . Distance of the point $(\alpha,\beta,\gamma)$ from y-axis is

(a) $\beta$ (b) $|\beta|$ (c)$|\beta|+|\gamma|$ (d ) $\sqrt{\alpha^2+\gamma^2}$

**********

# M CQ FOR CLASS XII MATHEMATICS 2020 (Prepared by- Mr. Sreejith S –PGT-Maths)

## SET3

1. The relation R on the set A $=\{1,2,3\}$ given by R = $\{(1,1),(1,2),(2,2),(2,3),(3,3)\}$ is
   a) Reflexive b) Symmetric c) Transitive d) Equivalence

2)Find the value of $\sin^{-1}\sin(\frac{4\pi}{5})$

a) $\frac{4\pi}{5}$ b) $\frac{4\pi}{5}$ c) $\frac{4\pi}{5}$ d) $\frac{4\pi}{5}$

3) If matrix A = $\begin{bmatrix}2 & 1\\7 & 5\end{bmatrix}$, then |A. adjA| = .....

a)9 (b) 3 (c )27 (d) 12

4)The integrating factor of the equation $x\frac{dy}{dx}-2y = x^2 + \sin x$ is

a) $x^2$ b) $x^{-2}$ c) $-x^2$ d) 1/x

5)If $x^2+y^2 = 5$ then $\frac{dy}{dx}$ is

a) x/y b) –x/y c) y d) none of these

6) Evaluate $\int \frac{2}{1+\cos 2x}\,dx$

(a)$\tan x$+c (b) $log\tan x$ +c (c) tan(x/2) +c (d) log(1+cos2x)+c

7) If $\theta$ is the angle between the vectors $2\hat{i}+2\hat{j}+4\hat{k}$ and $3\hat{i}+\hat{j}+2\hat{k}$ then $\sin\theta$ =

a) $\frac{2}{3}$ (b) $\frac{2}{\sqrt{7}}$ (c) $\frac{\sqrt{2}}{7}$ (d) None of these

8) Order of differential equation corresponding to a family of curves with two arbitrary constants, is

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

9) A line makes equal angles with co-ordinate axis. Direction cosines of this lines are

(a) $\pm(1,1,1)$ (b) $\pm\left(\frac{1}{\sqrt{3}},\frac{1}{\sqrt{3}},\frac{1}{\sqrt{3}}\right)$ c) $\pm\left(\frac{1}{3},\frac{1}{3},\frac{1}{3}\right)$ (d) $\pm\left(\frac{1}{\sqrt{3}},\frac{-1}{\sqrt{3}},\frac{-1}{\sqrt{3}}\right)$

10 The value(s) of p for which $2\vec{i}+p\vec{j}-3\vec{k}$ and $\vec{i}+p\vec{j}+2\vec{k}$ are orthogonal is (are)

(a) 1 (b) 1/2 (c) 2 or -2 (d) 1 or -1

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**KENDRIYA VIDYALAYA IDUKKI**

**MATHEMATICS CLASS -- XII**

| Q no: | **MCQ** | mark |
|---|---|---|
| 1 | Let $f: R \to R$ be the function defined by $f(x) = x^3 + 5$. Then , $f^{-1}(x)$ is<br>(a) $(x+5)^{1/3}$ (b) $(x-5)^{1/3}$ (c) $(5-x)^{1/3}$ (d) $5-x$ | 1 |
| 2 | If $\tan^{-1}\frac{a+x}{a} + \tan^{-1}\frac{a-x}{a} = \frac{\pi}{6}$ , then$x^2$ is<br>(a) $2\sqrt{3}$ a (b) $\sqrt{3}$ a (c) $2\sqrt{3}$ a$^2$ (d) none of these | 1 |
| 3 | If matrix A =$[a_{ij}]$ $of\ order\ 2\ x\ 2$ where $a_{ij} = \begin{cases} 1, & if\ i \neq j \\ 0, & if\ i = j \end{cases}$ then A$^2$ is equal to<br>(a) I (b) A (c) O (d) none of these | 1 |
| 4 | The number of points at which the function $f(x) = \frac{1}{x-[x]}$ [ ] denotes the greatest integer function is not continuous is<br>(a) 1 (b) 2 (c) 3 (d) None of these | 1 |
| 5 | If $f(x) = \lvert\cos x\rvert$ , then<br>(a) $f$ is everywhere differentiable (b) $f$ is everywhere continuous but not differentiable at $x = n\pi, n \in Z$ (c) $f$ is everywhere continuous but not differentiable at $x = (2n+1)\frac{\pi}{2}, n \in Z$ (d) none of the above | 1 |
| 6 | $\int_{a+c}^{b+c} f(x)dx$ is equal to<br>(a) $\int_a^b f(x-c)dx$ (b) $\int_a^b f(x+c)dx$ (c) $\int_a^b f(x)dx$ (d) $\int_{a-c}^{b-c} f(x)dx$ | 1 |
| 7 | The general solution of differential equation $\frac{dy}{dx} = e^{x^2/2}$+ xy is<br>(a) y = C $e^{-x^2/2}$ (b) y = C $e^{x^2/2}$ (c) y = (x + C) $e^{x^2/2}$ (d) y = (C - x) $e^{x^2/2}$ | 1 |
| 8 | If $\lvert\vec{a}\rvert = 10$, $\lvert\vec{b}\rvert = 2$ and $\vec{a}.\vec{b}$ = 12, then value of $\lvert\vec{a}\times\vec{b}\rvert$ is<br>(a) 5 (b) 10 (c) 14 (d) 16 | 1 |
| 9 | If $\lvert\vec{a}\rvert = 4$ and -3≤ μ ≤ 2, then the range of$\lvert\mu\vec{a}\rvert$ is<br>(a) [0,8] (b) [-12,8] (c) [0,12] (d) [8,12] | 1 |
| 10 | A flash light has 8 batteries of which 3 are dead. If two batteries are selected without replacement and tested then probability that both are dead is<br>(a) 33/56 (b) 9/ 64 (c) 1/14 (d) 3/28 | 1 |

| | **Answer key** | |
|---|---|---|
| 1 | $(x-5)^{1/3}$ | 1 |
| 2 | $2\sqrt{3}$ a$^2$ | 1 |
| 3 | I | 1 |
| 4 | None of these | 1 |
| 5 | $f$ is everywhere continuous but not differentiable at $x = (2n+1)\frac{\pi}{2}, n \in Z$ | 1 |
| 6 | $\int_a^b f(x+c)dx$ | 1 |
| 7 | y = (x + C) $e^{x^2/2}$ | 1 |
| 8 | 16 | 1 |
| 9 | [0,12] | 1 |
| 10 | 3/28 | 1 |

KENDRIYA VIDYALAYA ERNAKULAM REGION 2019-2020

KENDRIYA VIDYALAYA THRISSUR

CLASS XII

MATHEMATICS

MULTIPLE CHOICE QUESTIONS

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**1. A matrix $A$ has 11 elements, number of possible order of a matrix are ;**

$a$)4 b)3

c) 6 d) 2

**2. Let f: $R \to R$ be defined as f(x) = 3x - 2. Choose the correct answer.**

a) f is one-one onto b)f is many one onto
c)f is one-one but not onto d)f is neither one-one nor onto

**3. For what value of $\lambda$ , the matrix $\begin{bmatrix} \lambda+1 & 4 \\ 3 & 2 \end{bmatrix}$ is singular**

a) -1 b) 5 c) 0 d) -5

**4. $\int \frac{1}{Sin^2 x Cos^2 x} dx$ is equal to**

a) $\tan x + \cot x + C$ b)$(\tan x + \cot x)^2$+ C

c)$\tan x - \cot x + C$ d)$(\tan x - \cot x)^2$ + C

**5. The total revenue in rupees received from the sale of x units of product is given by R(x) = $3x^2 + 36x + 5$. Find the marginal revenue when x = 5**

a) Rs 66 b)Rs 96
b) c)Rs 36 d)Rs 126

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

a) $x + y = 0$ b)$x - y = 0$

b) c)$x + y + 1 = 0$ d)$x - y + 1 = 0$

7.The number of all possible matrices of order 3x3 with each entry 0 or 1 is

a) 27 b) 18

b) c) 81 d) 512

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

a) 3 b) 2

b) c) 1 d) 0

9. The corner points of the feasible region determined by the following system of linear inequalities: $2x + y \leq 10$, $x + 3y \leq 15$, $x, y \geq 0$ are (0,0), (5,0), (3,4), (0,5). Let Z= px + qy, where p,q > 0. Condition on p and q so that the maximum of Z occurs at both (3,4) and (0,5) is

a) $p = q$ b) $p = 2q$

b) c) $p = 3q$ d) $q = 3p$

10. The probability of obtaining an even prime number on each dies, when a pair of dice rolled is

a) 0 b) 1/3 ]

b) c) 1/12 d) 1/36

11. $\int \frac{e^x(1+x)}{cos^2(e^x x)}$dx equals to

a) $\tan(e^x) + c$ b) $\cot(e^x) + c$

c) $\tan(xe^x) + c$ d) $-\cot(e^x) + c$

12.The derivative of $e^{\sin^{-1}x}$ is

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

c) $e^{\sin^{-1}x}(\sqrt{1-x^2})$ d) $e^{\sin^{-1}x}(\sqrt{1+x^2})$

13.Rate of change of volume of a sphere of diameter $r$ w.r.t $r$ is –

a)$4\pi r^2$ b) $\frac{4}{3}\pi r^2$

c) $\frac{1}{2}\pi r^2$ d) $\pi r^2$

14.If $\int e^{-2\log x}\,dx = f(x) + C$, then $f(x)$ is –

a) $\frac{e^{-2\log x+1}}{-2\log x+1}$ b) $-2\log x\, e^{-2\log x+1}$

c) $\frac{1}{x^2}$ d) $-\frac{1}{x}$

**15.Distance between two planes: $2x + 3y + 4z = 4$ and $4x + 6y + 8z = 12$ is**

a) 2 units b) 4 units

b) c) 8 units d) $\frac{2}{\sqrt{29}}$ units

## ANSWERS

1. d) 2
2. a)f is one-one onto
3. b) 5
4. c)$\tan x - \cot x + C$
5. a) Rs 66
6. b)$x - y = 0$
7. d) 512
8. d) 0
9. d) q = 3p
10. d) 1/36
11. c) $\tan(xe^x) + c$
12. a)$\frac{e^{\sin^{-1}x}}{\sqrt{1-x^2}}$
13. c) $\frac{1}{2}\pi r^2$
14. d) $-\frac{1}{x}$
15. d) $\frac{2}{\sqrt{29}}$

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CLASS XII

MATHEMATICS

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1.The value of c in Rolle′ s theorem when f(x)= $2x^3$- $5x^2$ – 4x + 3 , x€ [1/3, 3] is

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

2. The angle between the curves $y^2$=x and $x^2$=y at (1,1) is

(a) $\tan^{-1}\frac{4}{3}$ (b) $\tan^{-1}\frac{3}{4}$ (c) $90^0$ (d) $45^0$

3. $\int_0^1 \frac{1}{1+x^2}dx = ---$

(a) $45^0$ (b) $30^0$ (c) $60^0$ (d) 2/3

4. If f(1)=4, $f^1$(1)=2, the value of derivative of log f($e^x$) $w.r.to\ x\ at\ x = 0\ is$

(a) 2 (b) 1 (c) -2 (d) ½

5. $\overrightarrow{a}$ and $\overrightarrow{b}$ are two unit vectors and α be the angle between them, then $\vec{a}$ + $\vec{b}$ is a unit vector , if

(a) $45^0$ (b) $120^0$ (c) $60^0$ (d) $90^0$

6. $\tan^{-1}\frac{1}{11} + \tan^{-1}\frac{2}{11}$ is equal to

(a) 0 (b) 1 (c) -2 (d) 3

7. The order of the differential equation $2x^2\frac{d^2y}{dx^2}$ - $3\frac{dy}{dx}$ + y=0 is;

(a) 2 (b) 1 (c) 0 (d) not defined

8. Let R be a relation defined on Z as R= { (a,b) ; $a^2$+$b^2$=25 } , the domain of R is;

(a) {3,4,5} (b) {0,3,4,5} (c) {0,3,4,5,-3,-4,-5} (d) none

9. If A and B are two events such that p(A)+P(B)-P(AUB)=P(A), then which is true

(a) P(A/B)=1 (b) P(B/A)= 1 (c) P(B/A)=0 (d) none

10. The approximate value of $(33)^{1/3}$ is;

(a) 2 . 0125 (b) 2. 1 (c) 2. 01 (d) none of these

ANSWERS

1 (d) 2(d) 3 ( a) 4( d) 5(c) 6(a) 7(a) 8(c) 9(a) 10(a)

**KV ADOOR SHIFT I**
**CLASS- XII**
**MATHEMATICS**

1. The value of cos( $\sin^{-1}(3/5) + \sin^{-1}(5/13)$ )
   a. 30/65 b. 33/15 c. 33/65 d. None of the above

2. If A is a square matrix of order 3 such that adj(2A) = K(adjA) then the value of K is
   a. 2 b. 1 c. I (Unit Matrix ) d. 0

3.If $A^2$-A+I = 0 then the inverse of A is
   a. A + I b. I – A c. A – I d. None of these

4.$\int \left(e^x secx(1 + tanx)\right) dx$equal
   a. $e^x$ secx + C b. $e^x$cosx + C c. $e^x$tanx+C d. $e^x$cotx + C

5. The vectors$d\hat{\imath} + \hat{\jmath} + 2\hat{k}, \hat{\imath} + d\hat{\jmath} - \hat{k}$and $2\hat{\imath} - \hat{\jmath} + d\hat{k}$are coplanar if,
   a. d = -2 b. d = 0 c. d = 1 d. d = -1

6. If$\vec{a} = \hat{\imath} + 2\hat{\jmath} + 3\hat{k}, \vec{b} = -\hat{\imath} + 2\hat{\jmath} + \hat{k}$and $\vec{c} = 3\hat{\imath} + \hat{\jmath}$find 't' such that $\vec{a} + t\vec{b}$is perpendicular to $\vec{c}$
   a. 0 b. 5 c. 4 d. None of these

7. Find the value of k for which the lines are $\frac{x+1}{-6} = \frac{y-2}{2} = \frac{z-5}{10}$and $\frac{x+3}{-3} = \frac{y-1}{k} = \frac{z-5}{5}$are parallel
   a. k = 1 b. k = 2 c. k = 3 d. None of these

8. If P(A) = 4/5 and P($A \cap B$) = 7/10 then find P(B/A) is equal to
   a. 1/ 10 b. 1/8 c. 7/8 d. 17/20

9. What is the maximum value of 3x + 2y at the corner points (0,7) , (2,3), (4,1), (8,0) of the convex polygon region.
   a. 24 b.14 c.6 d. None of these

10. The area of the parallelogram whose adjacent sides are $\vec{a} = 3\hat{\imath} + \hat{\jmath} + -2\hat{k}, \vec{b} = \hat{\imath} - 3\hat{\jmath} + 4\hat{k}$is
   a. 10 $\sqrt{3}$sq.unit b. 3$\sqrt{5}$sq.unit c. 5$\sqrt{7}$sq.unit d. None of these

**ANSWERS**

1. c
2. a
3. b
4. a
5. a
6. b
7. a
8. c
9. a
10. a

# MINIMUM LEVEL OF LEARNING

MATHEMATICS CLASS XII

TRIVANDRUM CLUSTER

**Prepared by. V M MADHUSUDANAN NAIR PGT MATHS KV CRPF PALLIPURAM**

## CHAPTER 1.RELATIONS AND FUNCTIONS

## 1 MARK OR 2 MARK QUESTIONS

1. Let $*$be a binary operation defined by$a * b = 2a+b-3$. Write the value of $3*4$.

2. Examine which of the following is a binary operation.

(i) $a* b = \frac{a+b}{2}$ , a,b∈N (ii) $a* b = \frac{a+b}{2}$ , a,b ∈ Q, for the binary operation check the commutative and associative property.

3. Let $f: R—\{-\frac{3}{5}\} \to R$ *be a function defined as* $f(x) = \frac{2x}{5x+3}$,

*find* $f^{-1}$: *Range of* $f \to R - \left(-\frac{3}{5}\right)$.

4.Let $f: R \to R$ *be a function defined by* $f(x) = \frac{3x+5}{2}$ *is an invertible function,*

find $f^{-1}$.

6. Let $*$be a binary operation on N given by $a * b =$ HCF $(a, b), a, b \in N$. Write the value of $22*4$.

7.If $f: R \to R$ is defined by $f(x) = 3x - 4$ then find $f^{-1}$.

8.If $f: R \to R$ is defined by $f(x) = (3 - x^3)^{\frac{1}{3}}$, then find $fof\ (x)$.

9. Give an example to show that the relation R in the set of natural numbers , defined by

$R = \{(x , y): x, y \in N , x \leq y^2\}$ is not transitive.

10.Write a number of all one-one functions from the set A={ a , b , c} to itself.

11. Let A = {1, 2,3}, B = {4, 5, 6, 7} and let f = {(1, 4), (2, 5), (3, 6)} be a function from A to B.

whether f is one-one or not.

12. The binary operation $*$ : R xR $\to$ R is defined as a $*$ b = 2a + b. Find $(2 * 3) * 4$.

13. If f: R →R is defined by f(x) = $x^2$ – 3x +2, find f(f(x))

14.If the functions f: **R→R** given by f(x) = $x^2$ + 3x + 1 and g : **R→R** is given by g(x) = 2x – 3,

find $f \circ g$ and $g \circ f$

15.Let A = {1, 2, 3}, B = {4, 5, 6, 7} and let f = {(1, 4), (2, 5), (3, 6)} be a function from AtoB.

whether f is one-one or not.

16.If f(x) = x + 7 and g(x) = x – 7, x∈**R**, find $f \circ g(7)$

17. Let * be a binary operation on the set **Q** defined by a * b = a + ab, check whether * is commutative and associative.

18.Let * be the binary operation on the set {1, 2, 3, 4, 5} defined by a * b = HCF of a and b Is the operation * a) Commutative b) Associative

19. Let * be a binary operation on the set **Q** of rational number such that

a * b = $\frac{ab}{4}$. Find the identity element for the operation * on **Q**.

20 .If the binary operation * on the set $Z$ of integers is defined by $a * b = a + b - 5$, then write theidentity element for the operation * in $Z$.

## 04 MARKS OR 06 MARK QUESTIONS

1.Consider the binary operations * : $R \times R$ ® R and o : $R \times R$ ® $R$ defined as $a * b = |a - b|$ and $aob = a$ for all $a, b \in R$. Show that '*' is commutative but not associative, '$o$' is associative butnot commutative.

2.Let X be a non-empty set. P(X) be its power set. Let '*' be an operation defined on elements of P(X) by ,$A * B = A \cap B, A, B \in P(X)$ .

Then

(i) Prove that $*$ is a binary operation in P(X).
(ii) Is $*$ commutative?
(i) Is $*$ associative?
(ii) Find the identity element in P(X) w.r.t $*$ .
(iii) Find all the invertible elements of P(X).B
(iv) If o is another binary operation defined on P(X) as AoB=AUB then verify that O distributes it self over $*$.

3.Consider f: $R_+ \rightarrow$ [-5, ∞) given by f(x) =$9x^2$+6x-5. Show that f is invertible. Find the inverse of f.

4. Show that the relation R in the set $A = \{x : x \in W, 0 \leq x \leq 12\}$ given by

R=$\{(a,b): |a-b| \text{ is a multiple of } 4\}$ *is an equivalence relation. Also find the set of all* elements related to 2

5.Let $*$ be a binary operation defined on N×N, by $(a,b) * (c,d) = (a+c, b+d)$.
Show that $*$ isCommutative and associative. Also find the identity element for $*$ on N×N, if any.

6. Let $f: N \rightarrow N$ be defined by $f(n) = \begin{cases} \frac{n+1}{2}, \text{if } n \text{ is odd} \\ \frac{n}{2}, \text{if } n \text{ is even} \end{cases}$ *for all* $n \in N$.

Find whether the function f is bijective.

7.Let f:X→Y be a function . Define a relation R on X given by R={ (a , b) : f(a)= f(b)}. Show Ri s an equivalence relation on X.

8.Show that the relation S in the set A=$\{x: x \in Z: 0 \leq x \leq 12\}$given by

S =$\{(a,b): a,b \in A, |a-b|$is divisible by 4} is an equivalence relation. Find the set of all elements related to 1.

9. Let N be the set of natural numbers and R be the relation in N×N defined by

(a , b)R ( c , d) if ad=bc. Show that R is an equivalence relation.

10. Let f,g:R→R defined as f(x)= $|x|$ and g(x)=$[x]$ , where $[x]$ denotes the greatest integer less than or equal to x. Find fog(5/2) and gof(-$\sqrt{2}$).

11. Let $f: R \rightarrow R$ be defined as f(x) = 10x +7. Find the function $g : R \rightarrow R$ such that g o f = f o g =$I_R$.

12. A binary operation $*$ on the set {0, 1, 2, 3, 4, 5} is defined as:

$$a * b = \begin{cases} a+b, & \text{if } a+b < 6 \\ a+b-6, & \text{if } a+b \geq 6 \end{cases}$$

Show that zero is the identify for this operation and each element 'a' of the set is invertible with 6-a, being the inverse of 'a'.

13.Prove that the function f: N→ N, defined by f($x$) = $x^2$ + $x$+1 is one – one but not onto.

14. Let f :N →N be defined by f(x)=$\begin{cases} \frac{n+1}{2} & \text{if } n \text{ is odd} \\ \frac{n}{2} & \text{if } n \text{ is even} \end{cases}$ for every n ∈ $N$.Check whether Thefunction is bijective.

15.Consider f:$R_+ \rightarrow [4, \infty)$ given by f(x) = $x^2 + 4$ . *Show that* f is invertible with the inverse $f^{-1}$ of f given by $f^{-1}$(y) = $\sqrt{y-4}$ where $R_+$is the set of all non- negative real numbers.

16.*Given a non-empty set X, let *:P(X) x P(X) → P(X) be defined asA * B = ( A – B) ∪ (B – A), f*or all A, B ∈ P(X). Show that empty set ∅ is the identity element for the operation * and allthe elements A of P(X) are invertible with $A^{-1}$= A

17.Show that the function f: R → {x∈R :-1 < x < 1} defined by f(x) = $\frac{x}{1+|x|}$ , x ∈R is one- one and onto function.

18. Let f: N → R be a function defined as f(x)= $4x^2$ + 12x + 15. Show that f: N→Range f is invertible. Also find the inverse of f.

19. Show that the relation R in the set (a,$b$)$R$ (c ,d) ⟹a + d = b+ c on AXA , where A ={1,2,3,4,...10} is an equivalence relation. Hence write the equivalence class [(3,4)],a,b,c,d $\epsilon$ $A$.

20.Consider f:N → $N$ given by f(x) = $9x^2 + 6x - 5$. Show that f:N → $S$ is invertible where S is the range of f and find the inverse of f. Also find $f^{-1}(43) and\ f^{-1}(163)$.

21. A binary operation $*$ is defined on the set X= R-$\{-1\}$ by
x∗y = x+ y+xy ,∀ x,y $\epsilon$X Check whether $*$ is commutative and associative.
Find the identity element and also the inverse of each element of X.

22.If N denote the set of all natural numbers and R be the relation on NXN defined by (a,$b$)$R$ (c ,d) if ad(b+c) = bc(a+d).Show that R is an equivalence relation.

23.Consider f:$R_+$→ $[-9,\infty)$ given by f(x) = $5x^2 + 6x - 9$. Prove that f is invertible and $f^{-1}$(y)=$\frac{\sqrt{54-5y}-3}{5}$

24.Let A=QXQ and let $*$ be a binary operation defined by (a,b) $*$ (c,d) =(ac,b+ad) for(a,$b$),(c ,d)∈ A.Determine whether $*$ is commutative and associative.Then with respect to $*$ on A

(1)Find the identity element in A

(2)find the invertible elements ofA

KV PATTOM

**HOTS QUESTIONS:**

**CHAPTER 1**

**REALATIONS AND FUNCTION**

1. Given an non – empty set , X consider the binary operation * : $P(X) x\ P(X) \rightarrow P(X)$ given that
A*B = A ∩ $B$ for all A , B in P (X) , where P (X) is the power set of X. Show that X is the identity element and X is the only invertible element in P(X) with respect to *

2, consider the binary operation * : RxR→ R and 0: RxR → R defined as a*b = $|a-b|$ , $aob = a$ for all a∈R , show that * is commutative but not associative and 0 not commutative but associative. Further show that a*(b0c) = (a*b)0(a *c) . Does 0 distribute over *? Justify

3.Consider $f: R_+ \to [-5, \infty)$ $given\ by\ f(x) = x^2 + 6x - 5$ show that f is invetible and find its inverse

4.show that $f: w \to w$, $given\ by\ f(x) = \begin{cases} n+1\ if\ n\ is\ even \\ n-1\ if\ n\ is\ odd \end{cases}$ $is\ bijective.$

5, if f and g are real function defined by f (x) = 3x +2 and g(x) = 3x – 2 , find i) f0g ii) g0f iii)f0f iv )

g0g

6, **If** $\boldsymbol{sec^{-1}\left(-\frac{1}{x}\right) + 2sin^{-1}(1) = \pi}$ **,find** $\boldsymbol{x}$ **.**

**8,**Let f , g : R→ R be two functions defined as f(x) = $|x|$ + x and g(x) = $|x|$ – x , for all x ∈ R. then find fog and gof.

9;. Consider f : $R_+ \to$ 4,∞) given by f(x) = $x^2$ + 4.Show that f is invertible with inverse $f^{-1}$ of f given by $f^{-1}$( y ) = $\sqrt{y-4}$ .

10. Let f : N → R be a function defined by f(x) =$4x^2$ + 12x + 15 . Show that the function f : N → S , where S is range of f,is invertible. Find also $f^{-1}$

## 1Mark Question

1. **If** $f(x) = |x|$ $and$ $g(x) = |5x-2|$ $find\ fog\ and\ gof$ **.**
2. **If f: R** $\to R$ **be given by f ( x)** = $(3 - x^3)^{\frac{1}{3}}$ **then find** $fof(x)$
3. **Let * be a binary operation defined by a * b =2a.b-7. Is * associative?**
4. **If f(x) =** $\frac{4x+3}{6x-4}$ **,** $x \neq \frac{2}{3}$ **, show that f(f(x)) = x**
5. **If f(x) =x+7 and g(x) =x-7,** $x \in R, then\ find\ f \circ g(7)$ **.**
6. **If the binary operation * on the set of integers Z, is defined by a * b = a + 3b** $^2$ **, then find the value of 2 * 4.**
7. $If\ f(x) = x^2 + 1\ and\ g(x) = 2x - 1\ find\ fog(x)$
8. **If f(x) = x+7 and g(x) = x-7 where x∈ R find fog(5)**
9. ***If*** $\oplus$ ***is a binary operation on R defined by a*** $\oplus$ ***b = a/4 + b/7 for a, b*** $\in$ ***R, find the value of ( 2*** $\oplus$ ***5 )*** $\oplus$ ***7 .***

10. **If f: $R \to R$ be given by f(x) = $x^2$ + 3 and g(x) = $\sqrt{x-3}$ , then find f og (x).**
11. **Let * be a binary operation defined by a* b = 2a + b – 3 .Find 3*4**
12. **If $\oplus$ be a binary operation on Q defined by $a \oplus b = \frac{2a+b}{4}$ for all $a, b \in Q$ ,find $\left(8 \oplus \frac{7}{11}\right)$.**
13. **Let * be a binary operation, defined by a* b = 3a+4b – 2. Find 4 * 5**
14. **Let * be a binary operator of N given by a*b = L.C.M. of (a,b) $\forall$ a,b $\in$ N. Find (16*20)*40**
15. **Let * be a binary operation on N given by a * b = HCF(a,b), a,b $\in$ N. Write the value of 22 * 4.**

## 4 Marks Question

**16. Let A = N x N and * be a binary operation on A defined by (a,b) * (c,d) = (a+c,b+d). Show that * is commutative and associative. Find the identity element for * on A, if any.**

**17.Consider a binary operation *: QxQ →Q defined by a*b = a + b + ab, a,b$\in$ Q. Verity commutative property for *. Find the identity element and inverse element?**

**18.Let A = QxQ and * be the binary operation on A defined by (a,b) * (c,d) = (a+c, b+d). Show that * is commutative and associative. Find the identity element and invertible elements for * on A, if any.**

**19.Let * be a binary operation on Q defined by a * b = (ab)/4. Show that the operation * is commutative as well as associative. Also find its identity element.**

**20.Show that the operation $*$ on Q-$\{1\}$ defined by a*b = a+b-ab for all a,b$\in$ Q-$\{1\}$ satisfies : the closure property, the associative law, the commutative law, what is the identity element, and the inverse of each element of *.**

## 6 Marks Question

**21.Prove that the relation R on the set N x N defined by (a,b) R (c,d)↔ a + d = b + c for all**

**(a, b), (c,d) ϵ N x N Is an equivalence relation.**

**22.Let N be the set of all natural numbers and let R be a relation on N x N, defined by**

**(a,b) R (c,d) ↔ ad = bc for all (a,b), (c,d) ϵ N x N. Prove that R is an equivalence relation.**

**23.Let N denote the set of all natural numbers and R be the relation n N x N defined by**

**(a,b) R (c, d) ↔ ad (b + c) = bc (a + d). Check whether R is an equivalence relation on N x N.**

**24.Consider the binary operations * : R x R → R and o: R x R → R defined as a * b = |a-b| and aob = a for all a, b ϵ R. Show that '*' is commutative but not associative , 'o' is associative but not commutative.**

**25.Show that the relation R on the set A = {xϵZ; 0≤x≤12}, given by R = {(a, b) : |a-b|is a multiple of 4} is an equivalence relation.**

# SOLUTION

**1.|5x – 2 | , |5|x| - 2 |**

**2. x**

**3. Not associative**

**4. x**

**5. 7**

**6. 50**

**7. $4x^2$ – 4x + 2**

**8. 5**

**9. 73/56**

**10.x**

**11. 7**

**12. 183/44**

**13. 30**

**14. 80**

**15. 2**

**16. No identity element.**

**PREPARED BY**

**BEENA JOSEPH ,PGT MATHS**

**KV SAP PEROORKADA**

# KENDRIYA VIDYALAYA PANGODE

# MINIMUM LEVEL LEARNING MATERIAL

## TOPICS: RELATIONS AND FUNCTIONS, INVERSE TRIGONOMETRIC FUNCTIONS, MATRICES AND DETERMINANTS

1.If f(x) = x+7 and g(x) =x-7, find $f_og(7)$.Ans:72.If the binary operation * on the set of integers Z,is defined by a*b =2a+b-ab,then find the value of 3*4.Ans:-2.

3.If f is an invertible function, defined as f(x) =$\frac{3x-4}{5}$,write$f^{-1}$(x).Ans:$\frac{5x+4}{3}$

4.If the mapping f and g are given by f={(1,2),(3,5),(4,1)} and g ={(2,3),(5,1),(1,3)},write $f_og$.Ans:{(2,5),(5,2),(1,5)}.

5.Let Z be the set of all integers and R be the relation on Z defined as R = {(a,b):a,b are integers and a-b is divisible by 5}.Prove that R is an equivalence relation.

6.Let A =NxN and * be a binary operation on A defined by (a,b)*(c,d)=(a+c,b+d).Show that * is commutative and associative. Also find the identity element for * onA,if any.

## MINIMUM LEVEL OF LEARNING MATERIALS ( CHAPTER 1,2,3,4)

**JAYA.S PGT-MATHS KV PATTOM- 2**

## RELATIONS AND FUNCTIONS

1. If the binary operation * on the set R of real numbers defined by a * b =2a+b

Find the value of (2* 3)*4 . (Ans : 18)

2. .If A = R X R, R is the set of real numbers , * is a binary operation on A to A , defined by (a,b) * (c,d) = (a+c , b+d) . Find the identity element for * on A.(Ans : (0,0)

3. * is a binary operation on set of integers defined by a*b= a+b-15, then write the identity element for the operation * on z. (Ans : 15)

4. Let A be a non empty set and * is the binary operation on P(A) ={X: X is the subset of A} , defined by X * Y =X ∩ $Y$ , for all X,Y ∈ P(A) ,Find the identity element of the operation * . (Ans : X)

5. Let $Z$ be the set of all integers and $R$ be the relation on $Z$ defined as $R = \{(a,b) : a,b \in Z, \text{and } (a-b) \text{ is divisible by } 5\}$. Prove that $R$ is an equivalence relation.

6. Show that the relation defined on given by $A = \{x \in Z : 0 \le x \le 12\}$ $R = \{(a,b) : |a-b| \, is \, even\}$ an equivalence relation.Find the set of elements related to 1

7.Show that the function f : A→ $B$ , $A = R - \{3\}$ , $B = R - \{1\}$ , $defined\ by\ f(x) = \frac{x-2}{x-3}$is bijective. Find$f^{-1}$.( Ans; $\frac{3x-2}{x-1}$)

8. Consider the function , $f : R_+ \to [-5, \infty), f(x) = 9x^2 + 6x - 5$

Show that f is invertible and$f^{-1}(x)$=$\frac{\sqrt{x+6}-1}{3}$

9. Let A= N x N .,and * is a binary operation on A, (a,b) * (c,d) = (ac,bd) , Show that (A,* ) is associative, commutative, Find the identity, and inverse.(Ans : 1,1)

10. Let A = Q X Q, where Q is the set of all rational numbers and * be a binary operation on A defined by (a , b) * (c ,d ) = (ac, b + ad ) for all (a,b) ; (c,d)∈ $A$, Then show that * is not commutative but associative . Also find the

identity element of * in A , and the invertible elements of A. (Ans : (1,0) :1/a, -b/a  )

**MATHS CLASS 12 MCQS**

**Q.1)let R be the relation in the set N given by R={(a,b):a=b-2,b>6}.**

**Choose the correct answer.**

**(2,4)€R (b) (3,8) € R (c) (6,8)€ R (d) (8,7)€²R**

**Q.2)The value of $\cos^{-1}$ (-1/2) + sin -1 (-√3/2) is**

**(a) π/3 (b) -2π/3 (c) π/6 (d) none of these**

**Q.3 If A = [aij] is square matrix of order 3× 3 such that aij = $i^2$ –$J^2$ then A is**

**(a) symmetric matrix (B) null matrix**

**(c) skew symmetric matrix (d) diagonal matrix**

**Q.4 If A matrix of order m × n and B is a matrix such that AB′ and BA′ is defined, then order of matrix B is**

**(a) m×m (b) n×n (c) n×m (d) m×n**

**Q.5 The slope of the tangent to the curve $x=t^2 + 3t -8$, $y= 2t^2 – 2t -5$ at the point (2,-1) is**

**(a) 22/7 (b) 6/7 (c) 7/6 (d) -6/7**

**OR**

**The equation of the normal to curve x=sin x at (0,0) is**

**(a) X = 0 (b) y = 0 (c) x + y = 0 (d) x – y = 0**

**Q.6 The value of ∫ $\sin^6 x/\cos^8 x$ dx is**

**(a) $\tan^7 x/7$ + C (b) $\cot^7 x$ /7 + C (c) $\sin^7 x$/ 7 +C (d) none of these**

**Q.7 If the direction cosines of a line are k,k,k, then**

**(a) k > 0 (b ) 0<k<1 (c) k = 1 (d) k = 1/√3 or -1/√3**

**Q.8 If P (A) = 4/5 and P(Ā∩B ) = 7/10 then find P(B\A ) is equal to**

**(A) 1/10 (B) 1/8 (C) 7/8 (D) 17/20**

**Q.9The point on the curve $y = 2x^2 – 6x -4$ at which tangent is parallel to x-axis**

**(a) (-3/2, -17/2) (b) ( -3/2 , 17/2 ) (c) ( 3/2, -17/2 ) (d) none of these**

**Q.10 Distance between the two planes: 2x + 3y + 4z = 4 and 4x + 6y + 8z = 12 is**

**(a) 2 units (b) 4 units (c ) 8 units (d) 2/√29 units**

# KENDRIYA VIDYALAYA PANGODE

## CLASS XII MATHEMATICS

## MCQ

Q.1 If A is any square matrix of Order 3x3 such that $|A| = -2$, then the value of $|adjA|$ is ?

(a) 2 (b) – 4 (c) 4 ( d) 8

Q.2 The point on the curve $y^2 = x$, where the tangent makes an angle of $\frac{\pi}{4}$ with X $- axis$ is

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

Q.3 The Projection of vector $\vec{a} = 2\hat{i} - \hat{j} + \hat{k}$ along $\vec{\vec{b}} = \hat{i} + 2\hat{j} + 2\hat{k}$ is

(a) 1 (b) 2 (c) √6 (d) $\frac{2}{3}$

Q.4 If A and B are two events such that P(A)=0.2 , P(B)=0.4 and P(A ∪ B)=0.5 , then value of P(A/B) is ?

$(a)$ 0.1 $(b)$ 0.25 $(c)$ 0.5 $(d)$ 0.08

Q.5 The point which does not lie in the half plane $2x + 3y - 12 \leq 0$ is

$(a)$ (1,2) $(b)$ (2,1) $(c)$ (2,3) $(d)$(−3, 2)

Q.6 The Solution of $\sin^{-1}\left(\frac{2a}{1+a^2}\right) - \cos^{-1}\left(\frac{1-b^2}{1+a^2}\right) = \tan^{-1}\left(\frac{2x}{1-x^2}\right)$ is

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

Q.7 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 is

(a) $\frac{2}{5}$(b) $\frac{1}{15}$(c) $\frac{8}{15}$(d) $\frac{4}{15}$

Q.8 The value of $\int_{\frac{-\pi}{2}}^{\frac{\pi}{2}} x sin^6 x \ dx$

(a) 0 (b) 1 (c) − 5$\pi$ /32 (d) 5$\pi$ /32

Q.9 If f($x$) = |$cosx - sinx$|, then $f$ ' ( $\pi$ /6 )

(a) $-\frac{(1-\sqrt{3})}{2}$ (b)$\frac{(1-\sqrt{3})}{2}$ (c) $-\frac{(1+\sqrt{3})}{2}$ (d) $\left(\frac{1+\sqrt{3}}{2}\right)$

Q.10 The function ($x$) = |$x$| + |$x$ − 1| is

(a) Continuous at $x$ = 0 as well as at $x$ = 1

(b) Continuous at $x$ = 1 but not at $x$ = 0

(c) discontinuous at $x$ = 0 as well as at $x$ = 1

(d) Continuous at $x$ = 0 but not at $x$ = 1

Multiple choice Questions

Mathematics Class-XII

1.If A is a square matrix of order 3 and |A| = 3 then | A .adjA| is

a)3 b) 9 c) 27 d) none of these

2.If vectors a and b are of same magnitude, a.b = 9/2 and the angle between them is $60^{0,}$

, then the magnitude of the vectors is

a) 9/2 b) 9 c) 3/2 d) 3

3.If P(A) =0.4, P(B) =0.8 P(B/A) =0.6 then P(AUB) is

a)o.24 b)0.3 c)0.48 d)0.96

4.The point which lies in the half plane 2x+3y< 12 is

a)(4,2) b) (3,3) c)(1,2) d)none of these

5.If $3\sin^{-1}x + \cos^{-1}x = \pi/2$ then x is equal to

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

6.$\int \frac{dx}{sinxcosx}$ =

a)tanx+cotx+c b) tanx-cotx +c c)log |cosec2x-cot2x |+c d) log| cosec2x+cot2x|+c

7.Let f: R→R defined by f(x) = 4x+3 then $f^{-1}(15)$ is

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

8.The sum of X and Y intercepts made by the plane 3x+4y-5z = 6 is

a) 7 b) 7/2 c)3 d)4

9.If A =$\begin{bmatrix} 2 & -2 \\ -2 & 2 \end{bmatrix}$ and $A^2$ = kA then value of k is

a) 4 b) 2 c)8 d) none of these

10.The point on the curve y =$x^2$-4x+4 at which the tangent is parallel to X-axis is

a)(0,0) b)(0,2) c)(2,0) d) none of these

# MATHEMATICS

1. If $\left|\vec{a}\right|$=2, $\left|\vec{b}\right|$=1, $\vec{a}.\vec{b}=\sqrt{3}$ then the angle between $\vec{a}$ and $\vec{b}$ is

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

2. What is the order and degree of the differential equation, $\left(\frac{d^2y}{dx^2}\right)=\left[1+\left(\frac{dy}{dx}\right)^2\right]^{3/2}$

   *i)* Order 2, degree 3 ii) order 2, degree not defined iii) order 3, degree 2 iv) order 2, degree 2

3. $\int \frac{1+tan^2x}{1+tanx}$dx is equal to

   $i)\ cotx+c \quad ii)\ log\ tanx+c \quad iii)\ log(1+tanx)+c \quad iv)\ (1+tanx)^2+c$

4. If $tan^{-1}x+tan^{-1}y+tan^{-1}z=\frac{\pi}{2}$, x, y, z>0, then xy+yz+xz is equal to

   *i)* 1 ii) 0 iii) -1 iv) not defined

5. The value of $\int_0^1 \frac{e^x}{1+e^{2x}}$ dx is

   *i)* $\frac{\pi}{4}-e$ ii) $tan^{-1}\left(\frac{e-1}{e+1}\right)$ iii) $tan^{-1}\left(\frac{e+1}{e-1}\right)$ iv) $\frac{\pi}{4}+e$

6. The slope of the tangent to the curve $y=x^3-x+1$ at the point where the curve cuts y-axis is

   *i)* 2 ii) 1 iii) -1 iv) -2

   ii) If A and B are square matrices of order 3 such that | A| = -1 ,|B | = 3 Find |3AB|.

7. If $C_{ij}$ is the co factor of $a_{ij}$ of matrix

   A=$\begin{bmatrix} 12 & 13 & -16 \\ 9 & -18 & 27 \\ -21 & 7 & 8 \end{bmatrix}$, *then the value of* $a_{12}C_{13}+a_{22}C_{23}+a_{32}C_{33}$ is

   *i)* 8 ii) 0 iii) -21 iv) 148

8. If A=$\begin{bmatrix} 1 & 1 & 1 \\ 1 & 1 & 1 \\ 1 & 1 & 1 \end{bmatrix}$, *then* $A^4$ *is* i) $\begin{bmatrix} 4 & 4 & 4 \\ 4 & 4 & 4 \\ 4 & 4 & 4 \end{bmatrix}$ ii) $\begin{bmatrix} 27 & 27 & 27 \\ 27 & 27 & 27 \\ 27 & 27 & 27 \end{bmatrix}$ iii) $\begin{bmatrix} 81 & 81 & 81 \\ 81 & 81 & 81 \\ 81 & 81 & 81 \end{bmatrix}$ iv) $\begin{bmatrix} 1 & 1 & 1 \\ 1 & 1 & 1 \\ 1 & 1 & 1 \end{bmatrix}$

9. The value of

$sin^{-1}\left(\frac{12}{13}\right) + cos^{-1}\left(\frac{4}{5}\right) + tan^{-1}\left(\frac{63}{16}\right)$ is

*i)* $\frac{\pi}{2}$ *ii)* $\frac{\pi}{4}$ iii) $\frac{\pi}{3}$ iv) $-\frac{\pi}{2}$

10. If A=$\begin{bmatrix}-1\\2\\3\end{bmatrix}$, *and* $B = [-1 \quad -2 \quad -4]$ , find $(AB)^T$

*11.* The side of an equilateral triangle is increasing at the rate of 0.5cm/sec. Find the rate of increase of its perimeter.

12. Find x if $\begin{vmatrix}2 & 4\\5 & 1\end{vmatrix} = \begin{vmatrix}2x & 4\\6 & x\end{vmatrix}$

13. If $\vec{a}$ =3i-2j+6k find a unit vector along $\vec{a}$

14. Find the area of the parallelogram whose adjacent sides are i-j+3k and 2i-7j+k

15. Using principal value evaluate $\cos^{-1}(\cos\frac{2\pi}{3}) + \sin^{-1}(\sin\frac{2\pi}{3})$

*16.* If P(A ) = 7/13, P(B) = 9/13 and P(A ∩ B) = 4/13. Find P(A'/B).

17. Find the function g(x): R → R such that fog(x) = gof(x) = I(x), if f:R→ R and f(x) = $\frac{10x-7}{3}$.

18. Write the intercept cut off by the plane 2x + y - Z = 5 on x-axis.

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

20. Find the direction ratios of the line $\frac{x-4}{2} = \frac{y}{6}$ ; $z = 5$

# CLASS XII MATHEMATICS OBJECTIVE QUESTIONS

1) If f(x) = $[x]$ and g(x) =$|x|$ then find gof$\left(\frac{-5}{3}\right)$ – fog $\left(\frac{-5}{3}\right)$

a) 0 b) 1 c) 5/3 d) none of these.

2) The value of cot $(\sin^{-1} x)$ is ……

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

3) If A is a square matrix such that $|A|$ =5 then $|AA'|$ is ….

a) 25 b) 5 c)3/2 d) 0

4) Derivative of $\log(\log x)$ is …….

a) $\log\left(\frac{1}{x}\right)$ b) $\frac{1}{\log x}$ c) $\frac{1}{x\log x}$ d) $\frac{1}{\log\log x}$

5) The total revenue in Rupees 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

6) If A =$\begin{pmatrix}1\\2\\3\end{pmatrix}$ and B =$(2 \quad -3 \quad 4)$ then AB is ……

7) At what point the line y = x+1 is a tangent to the curve $y^2$ = 4x?

8) If $\vec{a}$ $and$ $\vec{b}$ are 2 unit vectors such that $\vec{a}+\vec{b}$ is also a unit vector then find $\left|\vec{a}-\vec{b}\right|$.

9) If a line makes angles $\alpha, \beta, \gamma$ with x, y and z axis respectively then $sin^2\alpha + sin^2\beta + sin^2\gamma$ is …..

10) The feasible region in LPP is always a ….. polygon.

KENDRIYA VIDYALAYA KOLLAM

MCQs

SUBJECT- MATHS CLASS 12

1. A is a non singular matrix of order 3 and $|A|$ = -4.The value of $|adjA|$

A. 4 B. -4 C. 16 D. -4

2. How many matrices are possible of order 3x3 with each entry 0 or 1 ?

A. 2 B. 9 C. 64 D. 512

3. The value of $\tan^{-1}\sqrt{3} - \cot^{-1}(-\sqrt{3})$ is

A. $-\pi$ B. $\Pi$ C. $\frac{\Pi}{2}$ D. $-\frac{\Pi}{2}$

4. If $A = \begin{bmatrix} \cos\alpha & -\sin\alpha \\ \sin\alpha & \cos\alpha \end{bmatrix}$, then for what value of ,A is an identity matrix

A.$-\pi$ B. 0 C. $\frac{\Pi}{2}$ D. $-\frac{\Pi}{2}$

5. If $\begin{vmatrix} 2x+5 & 3 \\ 5x+2 & 9 \end{vmatrix} = \begin{vmatrix} 0 & 0 \\ 0 & 0 \end{vmatrix}$,find x

A. 0 B. -5/2 C. -2/5 D. -13

6. Evaluate $\int_{-\pi/2}^{\pi/2} \sin^7 x \, dx$

A. 1 B. -1 C. 0 D. $\pi$

7. For what value of x the following matrix is singular?

$$\begin{pmatrix} 3-2x & x+1 \\ 2 & 4 \end{pmatrix}$$

A. 1 B. 2 C. 3 D. 4

8. Find the angle between the vectors $\vec{a} = \hat{\imath} - \hat{\jmath} + \hat{k}$ and $\vec{b} = 2\hat{\imath} + \hat{\jmath} - \hat{k}$

A.$-\pi$ B. 0 C. $\frac{\Pi}{2}$ D. $-\frac{\Pi}{2}$

9.Write the degree of the differential equation $y = x\frac{dy}{dx} + a\sqrt{1+\frac{dy}{dx}}$

A. Not defined B. 1 C. 2 D. 3

10.Find the principal value of $\sin^{-1}(\sin\frac{3\Pi}{5})$

A.$-\pi$ B. 0 C. $\frac{\Pi}{2}$ D. $-\frac{\Pi}{2}$

Ans : 1)c 2) D 3) C 4) B 5) D 6) C 7) A 8) C 9) C 10) C

# CLASS XII MATHEMATICS

## MULTIPLE CHOICE QUESTIONS

1) The distance of the plane r.$\frac{2}{3}i + \frac{3}{7}j - \frac{6}{7}k$ = 1 from the origin is

a) 1 b) 7c)$\frac{1}{7}$d) None of these

2) The point satisfying inequation 2x+3y $\leq 4$ is

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

3) Let A and B be two events such that P(A) =0.6 , P(B)=0.2, P(A/B)=0.5. Then P(A' / B') equals

a) $\frac{1}{10}$ b)$\frac{3}{10}$ c) $\frac{3}{8}$ d) $\frac{6}{7}$

4) The principal value of the expression $\cos^{-1}\cos(-680°)$ is

a) $\frac{2\pi}{9}$ b)$\frac{5\pi}{9}$ c)$\frac{34\pi}{9}$ d)$\frac{\pi}{9}$

5) The lines $\frac{x}{1} = \frac{y}{2} = \frac{z}{3}$ $and$ $\frac{x-1}{-2} = \frac{y-2}{-4} = \frac{z-3}{-6}$ are

a) Parallel b) Intersecting c) Skew d)Coincident

6) P is a point on the line segment joining the points (3,2,-1) and (6,2,-2). If x coordinate of P is 5, then its y coordinate is

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

7) The sine of the angle between the straight line $\frac{x-2}{3} = \frac{y-3}{4} = \frac{z-4}{5}$ and the plane 2x-2y +z = 5 is

a) $\frac{10}{6\sqrt{5}}$ b) $\frac{4}{5\sqrt{2}}$ c)$\frac{2\sqrt{3}}{5}$ d)$\frac{\sqrt{2}}{10}$

8) If $\alpha, \beta, \gamma$ are the angles that a line makes with the positive direction of x, y, z axis respectively, the direction cosines of the line are

a) $sin\alpha, sin\beta, sin\gamma$ b) $cos\alpha, cos\beta, cos\gamma$ c) $tan\alpha, tan\beta, tan\gamma$ d) $cos\alpha, sin\beta, cos\gamma$

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

a) 0 b) $\frac{1}{2}$ c) 1 d) None of these

10) Which of the following is the indefinite integration of$x^2 + 7\ w.r.t\ x$ ?

a) 2x +C b) $x^3$ + 7x c) $\frac{x^3}{3} + 7x$ d) $\frac{x^3}{3} + 7x + C$

# ANSWERS

1)a2) c3) c 4) a 5) a6) a7) d8) b9) c10) d

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

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

2. If $\tan^{-1} x$ - $\cot^{-1} x$ = $\frac{\pi}{6}$, then x is

(a)$\sqrt{3}$ (b)$\frac{1}{\sqrt{3}}$ (c)1 (d) 0

3. Find the values of x , y , z , if $\begin{bmatrix} x+y+z \\ x+z \\ y+z \end{bmatrix} = \begin{bmatrix} 9 \\ 5 \\ 7 \end{bmatrix}$

(a)9,5,7 (b)2,3,4 (c)2,4,3 (d)1,2,3

4. 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$|A|$

5. Find $\frac{dy}{dx}$ ,if x$^2$ + y$^2$ = 5

(a)$\frac{x}{y}$ (b)$-\frac{x}{y}$ (c)$\frac{y}{x}$ (d) $-\frac{y}{x}$

6. If A and B are two independent events such that P(A) = $\frac{1}{7}$ and P(B) = $\frac{1}{6}$ then P(A'∩B') is ____

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

7. If the direction cosines of a line are $\frac{k}{3}$ , $\frac{k}{3}$ , $\frac{k}{3}$ then value of k is

(a)k>0 (b)0<k<1 (c)k = $\frac{1}{3}$ (d)k= 3

8. $\int cot^2 x\ dx$ is equal to

(a)cot x - x +c (b) cot x + x + c (c)-cot x + x + c (d)cot x

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

(a)x = 0 (b) y = 0 (c)x + y =0 (d)x - y =0

10. Find the rate of change of the area of a circle with respect to its radius r when r = 5 cm

(a) 5 (b)25 (c)10 (d)10$\pi$

ANSWERS:1.c 2.a 3.c 4.b 5.b 6.b 7.c 8.a 9.c 10.d