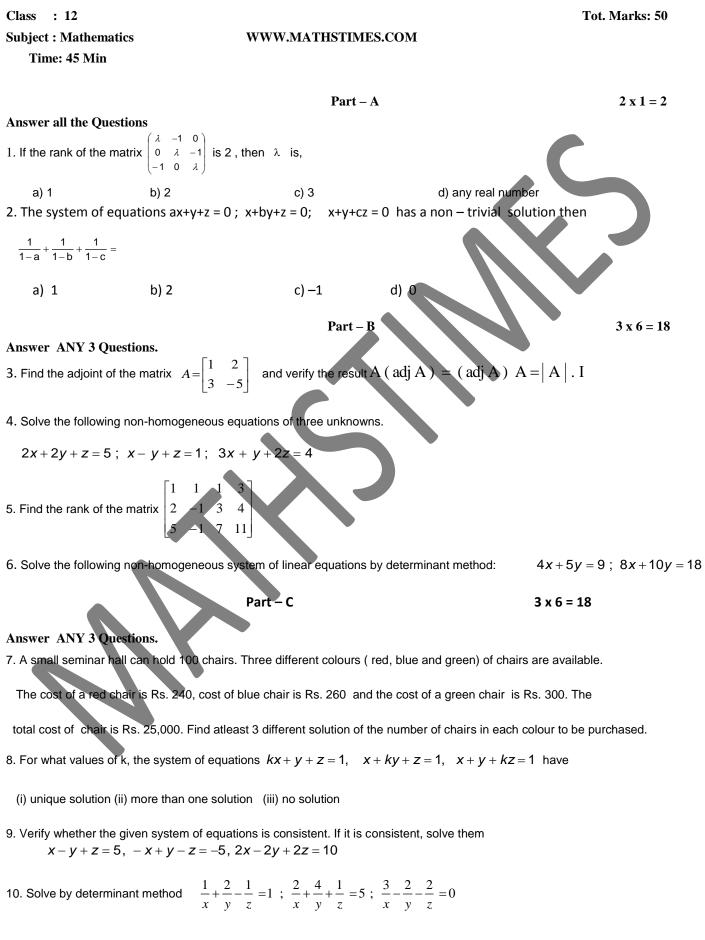
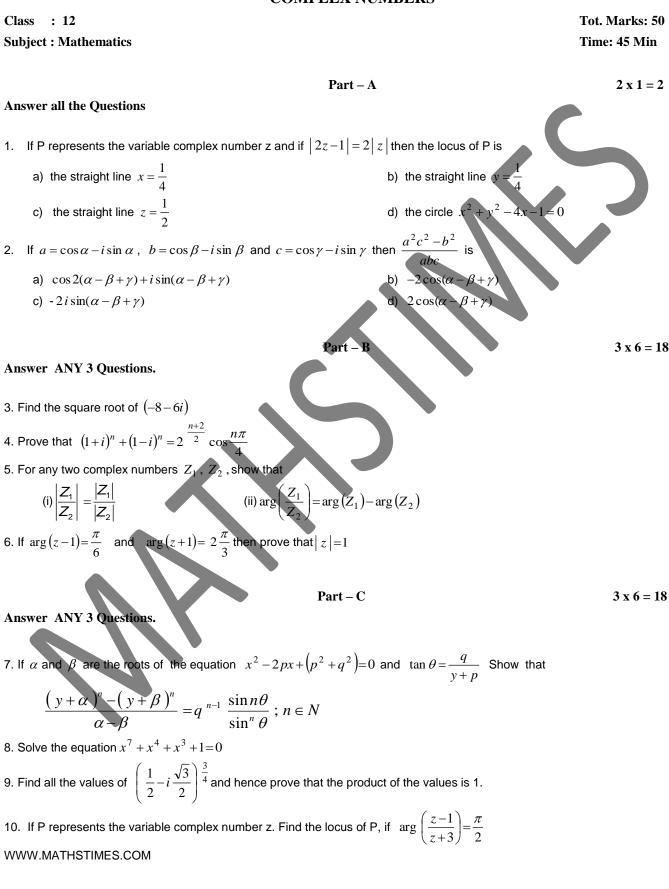
UNIT TEST – 1 APPLICATIONS OF MATRICES AND DETERMINANTS



UNIT TEST – 2 VECTOR ALGEBRA

VECTOR ALGEBRA									
Class : 12	Tot. Marks: 50								
Subject : Mathematics	Time: 45 Min								
Part – A	$2 \ge 1 = 2$								
Answer all the Questions									
1. The error of the nervelle error herring a diagonal 0 , \vec{t} , \vec{t} , and a side \vec{t} , 0 , 4 , 4 , 4									
1. The area of the parallelogram having a diagonal $3\vec{i} + \vec{j} - \vec{k}$ and a side $\vec{i} - 3\vec{j} + 4\vec{k}$									
a) $10\sqrt{3}$ b) $6\sqrt{30}$ c) $\frac{3}{2}\sqrt{30}$ d)) 3√30								
2. The shortest distance between the parallel lines $\frac{x-3}{4} = \frac{y-1}{2} = \frac{z-5}{-3}$ and $\frac{x-1}{4} = \frac{y-2}{2} = \frac{z-3}{3}$									
a) 3 b) 2 c) 1	d) 0								
Part – B	3 x 6 = 18								
Answer ANY 3 Questions.									
3. Show that diameter of a sphere subtends a right angle at a point on the surface by vector	method.								
4. Show that the two lines $\vec{r} = (\vec{i} - \vec{j}) + t(2\vec{i} + \vec{k})$ and $\vec{r} = (2\vec{i} - \vec{j}) + s(\vec{i} + \vec{j} - \vec{k})$ are skew	lince and find								
4. Show that the two lines $r = (l - j) + l (2l + k)$ and $r = (2l - j) + s (l + j - k)$ are skew									
the distance between them.									
5. Prove that $[\vec{a} \times \vec{b}, \vec{b} \times \vec{c}, \vec{c} \times \vec{a}] = [\vec{a}, \vec{b}, \vec{c}]^2$									
6. a) For any vector \vec{r} prove that $\vec{r} = (\vec{r} \cdot \vec{i})\vec{i} + (\vec{r} \cdot \vec{j})\vec{j} + (\vec{r} \cdot \vec{k})\vec{k}$									
b) A force given by $3\vec{i}+2\vec{j}-4\vec{k}$ is applied at the point (1,-1,2). Find the moment of the force about the									
point (2,-1,3).									
	2 (19								
Part – C Answer ANY 3 Questions.	$3 \ge 6 = 18$								
Answei AIVI 5 Questions.									
7. Find the vector and Cartesian equation of the plane containing the line $\frac{x-2}{2} = \frac{y-2}{3} = \frac{z-1}{3}$	and parallel to the								
$\frac{1}{2}$ $\frac{1}{3}$ $\frac{1}{3}$ $\frac{1}{3}$									
line $\frac{x+1}{3} = \frac{y-1}{2} = \frac{z+1}{1}$.									
$\frac{1}{3} = \frac{2}{2} = \frac{1}{1}$.									
8. Prove that $\sin(A+B) = \sin A \cos B + \cos A \sin B$									
9. Show that the lines $\frac{x-1}{1} = \frac{y+1}{-1} = \frac{z}{3}$ and $\frac{x-2}{1} = \frac{y-1}{2} = \frac{-z-1}{1}$ intersect and find their point	t of intersection.								
10. If $\vec{a} = 2\vec{i} + 3\vec{j} - \vec{k}$, $\vec{b} = -2\vec{i} + 5\vec{k}$, $\vec{c} = \vec{j} - 3\vec{k}$ Verify that $\vec{a} \times (\vec{b} \times \vec{c}) = (\vec{a} \cdot \vec{c})\vec{b} - (\vec{a} \cdot \vec{c})\vec{b}$	$(\vec{b})\vec{c}$								
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UNIT TEST – 3 COMPLEX NUMBERS



UNIT TEST – 4

ANALYTICAL GEOMETRY

Class : 12 Subject : Mathematics Tot. Marks: 50 Time: 45 Min

Part – A

 $2 \ge 1 = 2$

Answer all the Questions

- 1. If the length of major and semi-minor axes of an ellipse are 8,2 and their corresponding equations y 6 = 0 and x + 4 = 0 then the equations of the ellipse is.
 - a) $\frac{(x+4)^2}{4} + \frac{(y-6)^2}{16} = 1$ b) $\frac{(x+4)^2}{16} + \frac{(y-6)^2}{4} = 1$ c) $\frac{(x+4)^2}{16} - \frac{(y-6)^2}{4} = 1$ d) $\frac{(x+4)^2}{4} - \frac{(y-6)^2}{16} = 1$

2. The normal to the rectangular hyperbola xy = 9 at $\left(6, \frac{3}{2}\right)$ meets the curve again at.

a) $\left(\frac{3}{8}, 24\right)$ b) $\left(-24, \frac{-3}{8}\right)$ c) $\left(\frac{-3}{8}, -24\right)$

Answer ANY 3 Questions.

- 3. Prove that the tangent at any point to the rectangular hyperbola forms with the asymptotes a triangle of constant area.
- 4. The headlight of a motor vehicle is a parabolic reflector of diameter 12cm and depth 4cm. Find the position of bulb on the axis of the reflector for effective functioning of the headlight.

Part – B

- 5. The tangent at any point of the rectangular hyperbola $xy = c^2$ makes intercepts a, b and the normal at the point makes intercepts p,g on the axes. Prove that ap + bq = 0
- 6. Find the angle between the asymptotes of the hyperbola $3x^2 y^2 12x 6y 9 = 0$

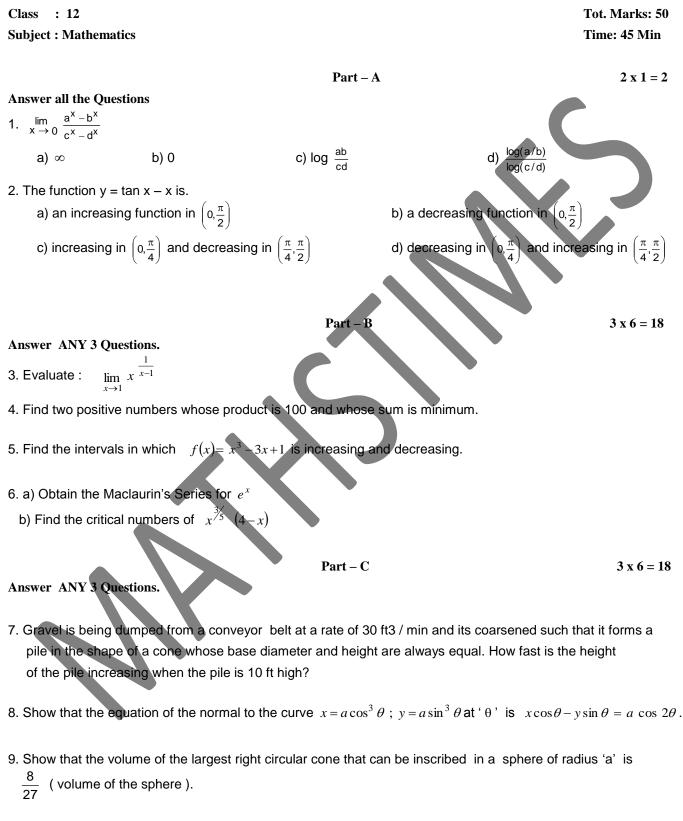
Answer ANY 3 Questions.

- 7. Find the equation of the rectangular hyperbola which has for one of its asymptotes the line x+2y-5=0and passes through the points (6,0) and (-3,0).
- 8. On lighting a rocket cracker it gets projected in a parabolic path and reaches a maximum height of 4mts when it is 6 mts away from the point of projection. Finally it reaches the ground 12 mts away from the starting point. Find the angle of projection.
- 9. The ceiling in a hallway 20ft wide is in the shape of a semi ellipse and 18ft high at the centre. Find the height of the ceiling 4 feet from either wall if the height of the side walls is 12ft.
- 10. Find the eccentricity, centre, foci and vertices of the hyperbola $9x^2 16y^2 18x 64y 199 = 0$ and also trace the curve. WWW.MATHSTIMES.COM

 $3 \ge 6 = 18$

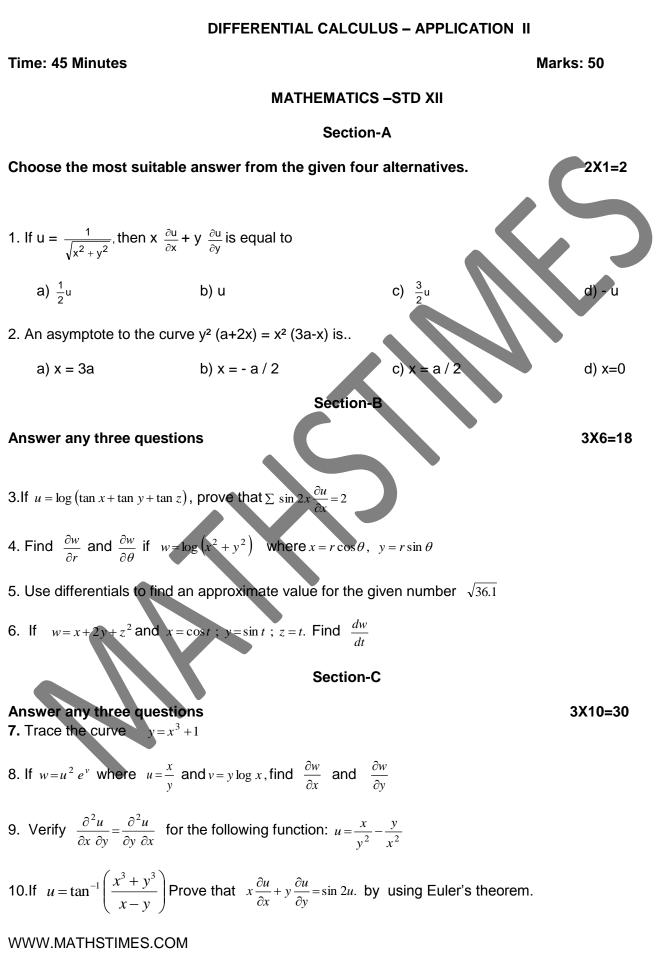
 $3 \ge 6 = 18$

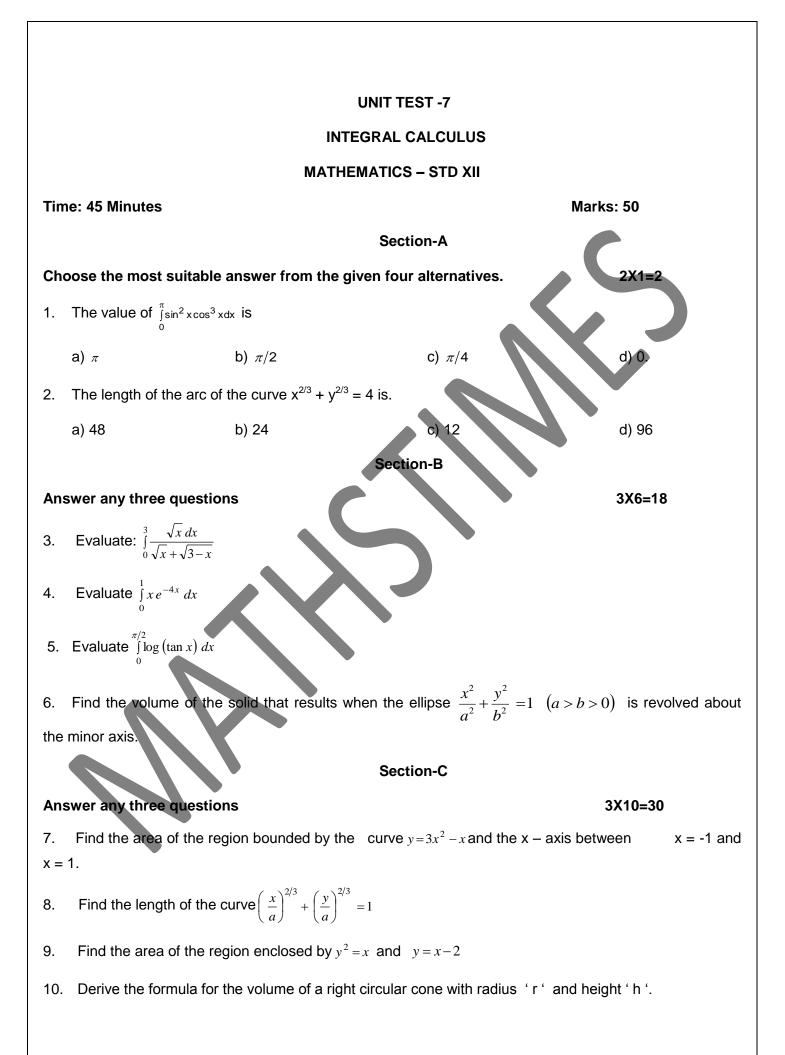
UNIT TEST – 5 DIFFERENTIAL CALCULAS APPLICATIONS - 1

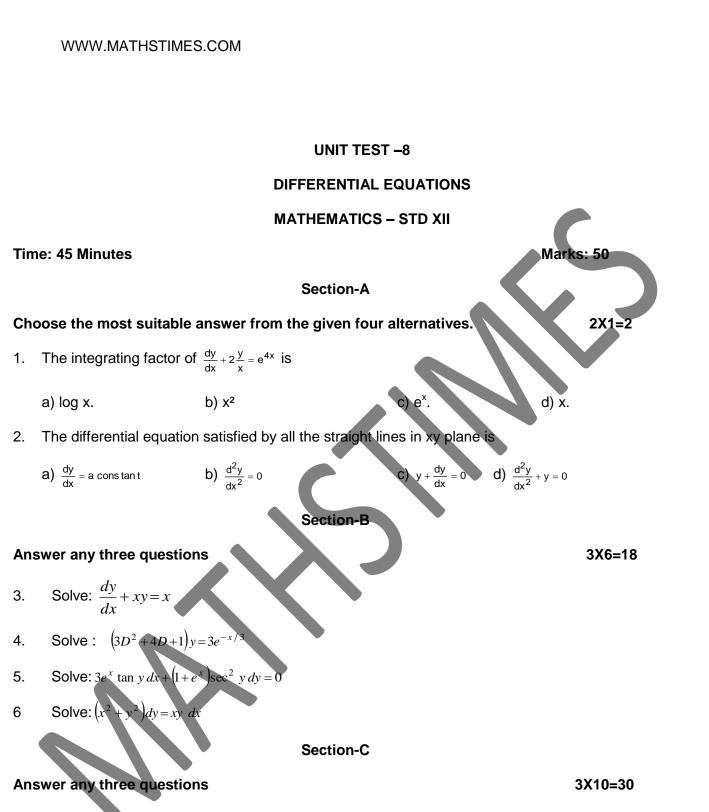


10. Find the intervals of concavity and the points of inflection of the function : $y=12x^2-2x^3-x^4$ WWW.MATHSTIMES.COM

UNIT TEST -6







7. Radium disappears at a rate proportional to the amount present. If 5% of the original amount disappears in 50 years, how much will remain at the end of 100 years. [Take A_0 as the initial amount]

8. Solve
$$(D^2 - 6D + 9)y = x + e^{2x}$$

9. Show that the equation of the curve whose slope at any point is equal to y+2x and which passes through the origin is $y=2(e^x-x-1)$

10. Solve
$$(x + y)^2 \frac{dy}{dx} = a^2$$

UNIT TEST -9

DISCRETE MATHEMATICS

MATHEMATICS – STD XII

Time: 45 Minutes

Section-A

Choose the most suitable answer from the given four alternatives.

- 1. monoid becomes a group if it also satisfies the
 - a) closure axiom. b) associative axiom c) identity axiom
- 2. The order of -i in the multiplicative group of 4th roots of unity

a)4 b) 3

Section-B

Answer any three questions

3X6=18

2X1=2

Marks: 50

d) inverse axiom

d) 1

- 3. State and prove cancellation laws on groups.
- 4. Show that $p \leftrightarrow q \equiv ((\sim p) \lor q) \land ((\sim q) \lor p)$
- 5. $\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$, $\begin{pmatrix} -1 & 0 \\ 0 & 1 \end{pmatrix}$, $\begin{pmatrix} 1 & 0 \\ 0 & -1 \end{pmatrix}$, $\begin{pmatrix} -1 & 0 \\ 0 & -1 \end{pmatrix}$ form an abelian group, under multiplication of matrices.
- 6. Construct the truth tables for $(p \lor q) \lor r$

Section-C

Answer any three questions

3X10=30

7. Let G be the set of all rational numbers except 1 and * be defined on G by a * b = a+b-ab for all $a, b \in G$. Show that (G, *) is an infinite abelian group.

8. Show that the set $\{[1], [3], [4], [5], [9]\}$ forms an abelian group under multiplication modulo 11.

9. Show that the set of all matrices of the form $\begin{pmatrix} a & 0 \\ 0 & 0 \end{pmatrix}$, $a \in R - \{0\}$ forms an abelian group under matrix multiplication.

10. Show that the set $G = \left\{ a + b \sqrt{2} / a, b \in Q \right\}$ is an infinite abelian group with respect to addition.

	UNIT TEST	Г-10PR	OBAB	BILITY	DISTRI	BUTIONSM/	ATHEMATICS -	- STD XII		
Time: 45 Minutes Section-A						Marks: 50				
Choose the most suitable answer from the given four alternatives.							2X1=2			
1. A random variable X has the following probability mass function as follows										
		х	-2	3	1					
		P(X=x)	λ/6	λ/4	λ/ 12					
	Then the value of λ is									
	a) 1	b) 2				c) 3		d) 4		
2.	2. The distribution function F(x) of a random variable X is.									
	a) a decreasing function	on			b) a	non decreasing	g			
	c) a constant function				d) ir	creasing first a	nd then decrea	sing		
Answer any three questions Section-B 3X6=18										
 (I) Prove that the total probability is one.(ii) If the sum of mean and variance of a Binomial Distribution is 4.8 for 5 trials find the distribution. Find the Mean and Variance for the following probability density function: 										
$f(x) = \begin{cases} x e^{-x} & \text{, if } x > 0 \\ 0 & \text{, otherwise} \end{cases}$										
5. The life of army shoes is normally distributed with mean 8 months and standard deviation 2 months. If 5000 pairs are issued, how many pairs would be expected to need replacement within 12 months.										
6. In a Poisson distribution if $P(X=2) = P(X=3)$ find $P(X=5) [given e^{-3} = 0.050]$.										
An	swer any three questi	ons			Sec	tion-C		3X10=30		
7. The number of accidents in a year involving taxi drivers in a city follows a Poisson distribution with mean equal to 3. Out of 1000 taxi drivers find approximately the number of drivers with(i) no accident in a year (ii) more than 3 accidents in a year $\left[e^{-3} = 0.0498\right]$.										
8. Obtain k, μ and σ^2 of the normal distribution whose probability distribution function is given by										
	$f(x) = ke^{-2x^2 + 4x}$	$-\infty < \lambda$	< < ∞							

9. The mean weight of 500 male students in a certain college in 151 pounds and the standard deviation is 15 pounds. Assuming the weights are normally distributed, find how many students weigh (i) between 120 and155pounds (ii) more than 185 pounds

10.An urn contains 4 white and 3 red balls. Find the probability distribution of number of red balls in three draws one by one from the urn.(i) With replacement (ii) without replacement. WWW.MATHSTIMES.COM