PATTUKKOTTAI PALANIAPPAN MATHS

APPLICATIONS OF MATRICES AND DETERMINANTS

12th Standard EM

Reg.No. :

MATHS - A

P.A.PALANIAPPAN,MSc.,MPhil.,BEd.,

PG ASST IN MATHS

GBHSS-PATTUKKOTTAI

THANJAVUR DIST

9443407917

Time : 00:30:00 Hrs

Total Mark : 25

Answer All the questions

25 x 1 = 25

1) If A = $\begin{bmatrix} 2 & 3 \\ 5 & -2 \end{bmatrix}$ be such that $\lambda A^{-1} = A$, then λ is

(a) 17 (b) 14 (c) 19 (d) 21

2) If A^TA^{-1} is symmetric, then A^2 =

(a) A^{-1} (b) $(A^T)^2$ (c) A^T (d) $(A^{-1})^2$

3) If $0 \le \theta \le \pi$ and the system of equations x + (sinθ)y - (cosθ)z = 0, (cosθ)x - y +z = 0, (sinθ)x + y - z = 0 has a non-trivial solution then θ is

(a) $\frac{2\pi}{3}$ (b) $\frac{3\pi}{4}$ (c) $\frac{5\pi}{6}$ (d) $\frac{\pi}{4}$

4) The augmented matrix of a system of linear equations is $\begin{bmatrix} 1 & 2 & 7 & 3 \\ 0 & 1 & 4 & 6 \\ 0 & 0 & \lambda-7 & \mu+5 \end{bmatrix}$. The system has infinitely many solutions if

(a) $\lambda = 7, \mu \ne -5$ (b) $\lambda = 7, \mu = 5$ (c) $\lambda \ne 7, \mu \ne -5$ (d) $\lambda = 7, \mu = -5$

5) If P = $\begin{bmatrix} 1 & x & 0 \\ 1 & 3 & 0 \\ 2 & 4 & -2 \end{bmatrix}$ is the adjoint of 3 × 3 matrix A and |A| = 4, then x is

(a) 15 (b) 12 (c) 14 (d) 11

6) If A = $\begin{bmatrix} 7 & 3 \\ 4 & 2 \end{bmatrix}$, then 9I - A =

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

7) If A = $\begin{bmatrix} \frac{3}{5} & \frac{4}{5} \\ x & \frac{3}{5} \end{bmatrix}$ and $A^T = A^{-1}$, then the value of x is

(a) $\frac{-4}{5}$ (b) $\frac{-3}{5}$ (c) $\frac{3}{5}$ (d) $\frac{4}{5}$

8) If A = $\begin{bmatrix} \cos\theta & \sin\theta \\ -\sin\theta & \cos\theta \end{bmatrix}$ and A(adj A) = $\begin{bmatrix} k & 0 \\ 0 & k \end{bmatrix}$ then adj (AB) is

(a) 0 (b) sin θ (c) cos θ (d) 1

9) If $x^ay^b = e^m$, $x^cy^d = e^n$, $\Delta_1 = \begin{vmatrix} m & b \\ n & d \end{vmatrix}$, $\Delta_2 = \begin{vmatrix} a & m \\ c & n \end{vmatrix}$, $\Delta_3 = \begin{vmatrix} a & b \\ c & d \end{vmatrix}$, then the values of x and y are respectively,

(a) $e^{(\Delta_2/\Delta_1)}, e^{(\Delta_3/\Delta_1)}$ (b) $\log(\Delta_1/\Delta_3), \log(\Delta_2/\Delta_3)$ (c) $\log(\Delta_2/\Delta_1), \log(\Delta_3/\Delta_1)$ (d) $e^{(\Delta_1/\Delta_3)}, e^{(\Delta_2/\Delta_3)}$

10) If $(AB)^{-1} = \begin{bmatrix} 12 & -17 \\ -19 & 27 \end{bmatrix}$ and $A^{-1} = \begin{bmatrix} 1 & -1 \\ -2 & 3 \end{bmatrix}$, then B^{-1} =

(a) $\begin{bmatrix} 2 & -5 \\ -3 & 8 \end{bmatrix}$ (b) $\begin{bmatrix} 8 & 5 \\ 3 & 2 \end{bmatrix}$ (c) $\begin{bmatrix} 3 & 1 \\ 2 & 1 \end{bmatrix}$ (d) $\begin{bmatrix} 8 & -5 \\ -3 & 2 \end{bmatrix}$

11) If A = $\begin{bmatrix} 3 & 1 & -1 \\ 2 & -2 & 0 \\ 1 & 2 & -1 \end{bmatrix}$ and $A^{-1} = \begin{bmatrix} a_{11} & a_{12} & a_{13} \\ a_{21} & a_{22} & a_{23} \\ a_{31} & a_{32} & a_{33} \end{bmatrix}$ then the value of a_{23} is

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

12) If A = $\begin{bmatrix} 3 & -3 & 4 \\ 2 & -3 & 4 \\ 0 & -1 & 1 \end{bmatrix}$, then adj(adj A) is

(a) $\begin{bmatrix} 3 & -3 & 4 \\ 2 & -3 & 4 \\ 0 & -1 & 1 \end{bmatrix}$ (b) $\begin{bmatrix} 6 & -6 & 8 \\ 4 & -6 & 8 \\ 0 & -2 & 2 \end{bmatrix}$ (c) $\begin{bmatrix} -3 & 3 & -4 \\ -2 & 3 & -4 \\ 0 & 1 & -1 \end{bmatrix}$ (d) $\begin{bmatrix} 3 & -3 & 4 \\ 0 & -1 & 1 \\ 2 & -3 & 4 \end{bmatrix}$

13) If |adj(adj A)| = $|A|^9$, then the order of the square matrix A is

(a) 3 (b) 4 (c) 2 (d) 5

14) If adj A = $\begin{bmatrix} 2 & 3 \\ 4 & -1 \end{bmatrix}$ and adj B = $\begin{bmatrix} 1 & -2 \\ -3 & 1 \end{bmatrix}$ then adj (AB) is

(a) $\begin{bmatrix} -7 & -1 \\ 7 & -9 \end{bmatrix}$ (b) $\begin{bmatrix} -6 & 5 \\ -2 & -10 \end{bmatrix}$ (c) $\begin{bmatrix} -7 & 7 \\ -1 & -9 \end{bmatrix}$ (d) $\begin{bmatrix} -6 & -2 \\ 5 & -10 \end{bmatrix}$

15) If A is a 3 × 3 non-singular matrix such that $AA^T = A^TA$ and $B = A^{-1}A^T$, then BB^T =

(a) A (b) B (c) I (d) B^T

16) If A = $\begin{bmatrix} 2 & 0 \\ 1 & 5 \end{bmatrix}$ and B = $\begin{bmatrix} 1 & 4 \\ 2 & 0 \end{bmatrix}$ then |adj (AB)| =

(a) -40 (b) -80 (c) -60 (d) -20

17) Which of the following is/are correct?

(i) Adjoint of a symmetric matrix is also a symmetric matrix.

(ii) Adjoint of a diagonal matrix is also a diagonal matrix.

(iii) If A is a square matrix of order n and λ is a scalar, then adj(λA) = λ^n adj(A).

(iv) A(adjA) = (adjA)A = |A| I

(a) Only (i) (b) (ii) and (iii) (c) (iii) and (iv) (d) (i), (ii) and (iv)

18) If A is a non-singular matrix such that $A^{-1} = \begin{bmatrix} 5 & 3 \\ -2 & -1 \end{bmatrix}$, then $(A^T)^{-1}$ =

(a) $\begin{bmatrix} -5 & 3 \\ 2 & 1 \end{bmatrix}$ (b) $\begin{bmatrix} 5 & 3 \\ -2 & -1 \end{bmatrix}$ (c) $\begin{bmatrix} -1 & -3 \\ 2 & 5 \end{bmatrix}$ (d) $\begin{bmatrix} 5 & -2 \\ 3 & -1 \end{bmatrix}$

19) If ρ(A) = ρ([A | B]), then the system AX = B of linear equations is

(a) consistent and has a unique solution (b) consistent (c) consistent and has infinitely many solution (d) inconsistent

20) If A $\begin{bmatrix} 1 & -2 \\ 1 & 4 \end{bmatrix} = \begin{bmatrix} 6 & 0 \\ 0 & 6 \end{bmatrix}$, then A =

(a) $\begin{bmatrix} 1 & -2 \\ 1 & 4 \end{bmatrix}$ (b) $\begin{bmatrix} 1 & 2 \\ -1 & 4 \end{bmatrix}$ (c) $\begin{bmatrix} 4 & 2 \\ -1 & 1 \end{bmatrix}$ (d) $\begin{bmatrix} 4 & -1 \\ 2 & 1 \end{bmatrix}$

21) Let A = $\begin{bmatrix} 2 & -1 & 1 \\ -1 & 2 & -1 \\ 1 & -1 & 2 \end{bmatrix}$ and 4B = $\begin{bmatrix} 3 & 1 & -1 \\ 1 & 3 & x \\ -1 & 1 & 3 \end{bmatrix}$. If B is the inverse of A, then the value of x is

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

22) If A, B and C are invertible matrices of some order, then which one of the following is not true?

(a) adj A = $|A|A^{-1}$ (b) adj(AB) = (adj A)(adj B) (c) det A^{-1} = $(\det A)^{-1}$ (d) $(ABC)^{-1} = C^{-1}B^{-1}A^{-1}$

23) If A = $\begin{bmatrix} 3 & 5 \\ 1 & 2 \end{bmatrix}$, B = adj A and C = 3A, then $\frac{|adjB|}{|C|}$ =

(a) $\frac{1}{3}$ (b) $\frac{1}{9}$ (c) $\frac{1}{4}$ (d) 1

24) If A = $\begin{bmatrix} 1 & \tan\frac{\theta}{2} \\ -\tan\frac{\theta}{2} & 1 \end{bmatrix}$ and AB = I, then B =

(a) $\left(\cos^2\frac{\theta}{2}\right) A$ (b) $\left(\cos^2\frac{\theta}{2}\right) A^T$ (c) $\left(\cos^2\theta\right) I$ (d) $(\sin^2\frac{\theta}{2})A$

25) The rank of the matrix $\begin{bmatrix} 1 & 2 & 3 & 4 \\ 2 & 4 & 6 & 8 \\ -1 & -2 & -3 & -4 \end{bmatrix}$ is

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

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A - Answer Key

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1) (c) 19
2) (b) $(A^T)^2$
3) (d) $\frac{\pi}{4}$
4) (d) $\lambda = 7, \mu = -5$
5) (d) 11
6) (d) $2A^{-1}$
7) (a) $\frac{-4}{5}$
8) (d) 1
9) (d) $e^{(\Delta_1/\Delta_3)}, e^{(\Delta_2/\Delta_3)}$
10) (a) $\begin{bmatrix} 2 & -5 \\ -3 & 8 \end{bmatrix}$
11) (d) -1
12) (a) $\begin{bmatrix} 3 & -3 & 4 \\ 2 & -3 & 4 \\ 0 & -1 & 1 \end{bmatrix}$
13) (b) 4
14) (b) $\begin{bmatrix} -6 & 5 \\ -2 & -10 \end{bmatrix}$
15) (c) I
16) (b) -80
17) (d) (i), (ii) and (iv)
18) (d) $\begin{bmatrix} 5 & -2 \\ 3 & -1 \end{bmatrix}$
19) (b) consistent
20) (c) $\begin{bmatrix} 4 & 2 \\ -1 & 1 \end{bmatrix}$
21) (d) 1
22) (b) adj(AB) = (adj A)(adj B)
23) (b) $\frac{1}{9}$
24) (b) $\left(\cos^2 \frac{\theta}{2}\right) A^T$
25) (a) 1

PATTUKKOTTAI PALANIAPPAN MATHS

COMPLEX NUMBERS

Date : 23-Aug-19

12th Standard

Reg.No. :

Maths

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1) $i^n+i^{n+1}+i^{n+2}+i^{n+3}$ is

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

2) The value of $\sum_{i=1}^{13}\left(i^n+i^{n-1}\right)$ is

(a) 1+ i (b) i (c) 1 (d) 0

3) The area of the triangle formed by the complex numbers z,iz, and z+iz in the Argand's diagram is

(a) $\frac{1}{2}|z|^2$ (b) $|z|^2$ (c) $\frac{3}{2}|z|^2$ (d) $2|z|^2$

4) The conjugate of a complex number is $\frac{1}{i-2}$/Then the complex number is

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

5) If $z=\frac{\left(\sqrt{3}+i\right)^3(3i+4)^2}{(8+6i)^2}$, then |z| is equal to

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

6) If z is a non zero complex number, such that $2iz^2=\bar{z}$ then |z| is

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

7) If |z-2+i|≤2, then the greatest value of |z| is

(a) $\sqrt{3}-2$ (b) $\sqrt{3}+2$ (c) $\sqrt{5}-2$ (d) $\sqrt{5}+2$

8) If $\left|z-\frac{3}{z}\right|=2$ then the least value |z| is

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

9) If |z|=1, then the value of $\frac{1+z}{1+\bar{z}}$ is

(a) z (b) $\bar{z}$ (c) $\frac{1}{z}$ (d) 1

10) The solution of the equation |z|-z=1+2i is

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

11) If $|z_1|=1,|z_2|=2|z_3|=3$ and $|9z_1z_2+4z_1z_3+z_2z_3|=12$, then the value of $|z_1+z_2+z_3|$ is

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

12) If z is a complex number such that $z \varepsilon C/R$ and $z+\frac{1}{z}\epsilon R$ then|z| is

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

13) z_1, z_2 and z_3 are complex number such that $z_1+z_2+z_3=0$ and $|z_1|=|z_2|=|z_3|=1$ then $z_1^2+z_2^2+z_3^3$ is

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

14) If $\frac{z-1}{z+1}$ is purely imaginary, then |z| is

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

15) If z=x+iy is a complex number such that |z+2|=|z−2|, then the locus of z is

(a) real axis (b) imaginary axis (c) ellipse (d) circle

16) The principal argument of $\frac{3}{-1+i}$

(a) $\frac{-5\pi}{6}$ (b) $\frac{-2\pi}{3}$ (c) $\frac{-3\pi}{4}$ (d) $\frac{-\pi}{2}$

17) The principal argument of $(\sin 40° + i\cos 40°)^5$ is

(a) −110° (b) −70° (c) 70° (d) 110°

18) If (1+i)(1+2i)(1+3i)...(1+ni)=x+iy, then $2\cdot 5\cdot 10 \ldots \left(1+n^2\right)$ is

(a) 1 (b) i (c) x^2+y^2 (d) $1+n^2$

19) If $\omega \neq 1$ is a cubic root of unity and $(1+\omega)^7 = A+B\omega$,then (A,B) equals

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

20) The principal argument of the complex number $\frac{\left(1+i\sqrt{3}\right)^2}{4i\left(1-i\sqrt{3}\right)}$ is

(a) $\frac{2\pi}{3}$ (b) $\frac{\pi}{6}$ (c) $\frac{5\pi}{6}$ (d) $\frac{\pi}{2}$

21) If α and β are the roots of $x^2+x+1=0$, then $\alpha^{2020}+\beta^{2020}$ is

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

22) The product of all four values of $\left(cos\frac{\pi}{3}+isin\frac{\pi}{3}\right)^{\frac{3}{4}}$ is

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

23) If $\omega \neq 1$ is a cubic root of unity and $\begin{vmatrix} 1 & 1 & 1 \\ 1 & -\omega^2 & \omega^2 \\ 1 & \omega^2 & \omega^2 \end{vmatrix}$ =3k, then k is equal to

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

24) The value of $\left(\frac{1+3\sqrt{i}}{1-\sqrt{3i}}\right)^{10}$

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

25) If $\omega = cis\frac{2\pi}{3}$, then the number of distinct roots of $\begin{vmatrix} z+1 & \omega & \omega^2 \\ \omega & z+\omega^2 & 1 \\ \omega^2 & 1 & z+\omega \end{vmatrix}$

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

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1) (a) 0
2) (a) 1+ i
3) (a) $\frac{1}{2}|z|^2$
4) (b) $\frac{-1}{i+2}$
5) (c) 2
6) (a) $\frac{1}{2}$
7) (d) $\sqrt{5}+2$
8) (a) 1
9) (a) z
10) (a) $\frac{3}{2}-2i$
11) (b) 2
12) (b) 1
13) (d) 0
14) (b) 1
15) (b) imaginary axis
16) (c) $\frac{-3\pi}{4}$
17) (a) −110°
18) (c) x^2+y^2
19) (d) (1,1)
20) (d) $\frac{\pi}{2}$
21) (b) -1
22) (c) 1
23) (d) $-\sqrt{3i}$
24) (a) $cis\frac{2\pi}{3}$

25) (a) 1

PATTUKKOTTAI PALANIAPPAN MATHS

THEORY OF EQUATIONS

12th Standard EM

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1) If x^{2} - hx - 21 = 0 and x^2 - 3hx + 35 = 0 (h > 0) have a common root, then h = ___________

(a) 0 (b) 1 (c) 4 (d) 3

2) Ifj(x) = 0 has n roots, thenf'(x) = 0 has __________ roots

(a) n (b) n -1 (c) n+1 (d) (n-r)

3) If the root of the equation x^3 +bx^2+cx-1=0 form an Increasing G.P, then

(a) one of the roots is 2 (b) one of the rots is 1 (c) one of the rots is -1 (d) one of the rots is -2

4) The equation $\sqrt{x+1}-\sqrt{x-1}=\sqrt{4x-1}$ has

(a) no solution (b) one solution (c) two solution (d) more than one solution

5) If p(x) = ax^2 + bx + c and Q(x) = -ax^2 + dx + c where ac $\neq$ 0 then p(x). Q(x) = 0 has at least _______ real roots.

(a) no (b) 1 (c) 2 (d) infinite

6) If the equation ax2+ bx+c=0(a > 0) has two roots ∝ and β such that ∝< - 2 and β > 2, then

(a) b2-4ac=0 (b) b^2 - 4ac < 0 (c) b^2 - 4ac > 0 (d) b^2 - 4ac≥0

7) The number of real numbers in [0,2π] satisfying $\sin^4x-2\sin^2x+1$ is

(a) 2 (b) 4 (c) 1 (d) ∞

8) A polynomial equation in x of degree n always has

(a) n distinct roots (b) n real roots (c) n imaginary roots (d) at most one root

9) If ∝, β, ɣ are the roots of the equation x^3-3x+11=0, then ∝+β+ɣ is __________.

(a) 0 (b) 3 (c) -11 (d) -3

10) If α,β and γ are the roots of x^3+px^2+qx+r, then $\Sigma\frac{1}{\alpha}$ is

(a) $-\frac{q}{r}$ (b) $\frac{p}{r}$ (c) $\frac{q}{r}$ (d) $-\frac{q}{p}$

11) If $x^3+12x^2+10ax+1999$ definitely has a positive zero, if and only if

(a) a≥0 (b) a > 0 (c) a< 0 (d) a≤0

12) If a, b, c ∈ Q and p +√q (p,q ∈ Q) is an irrational root of ax^2+bx+c=0 then the other root is

(a) -p+√q (b) p-iq (c) p-√q (d) -p-√q

13) The quadratic equation whose roots are ∝ and β is

(a) (x - ∝)(x -β) =0 (b) (x - ∝)(x + β) =0 (c) ∝+β=$\frac{b}{a}$ (d) ∝.β=$\frac{-c}{a}$

14) If ∝, β,ɣ are the roots of 9x3-7x+6=0, then ∝ β ɣ is __________

(a) $\frac{-7}{9}$ (b) $\frac{7}{9}$ (c) 0 (d) $\frac{-2}{3}$

15) If ax^2 + bx + c = 0, a, b, c E R has no real zeros, and if a + b + c < 0, then __________

(a) c > 0 (b) c< 0 (c) c=0 (d) c≥0

16) For real x, the equation $\left|\frac{x}{x-1}\right| + |x| = \frac{x^2}{|x-1|}$ has

(a) one solution (b) two solution (c) at least two solution (d) no solution

17) Let a > 0, b > 0, c > 0. h n both th root of th quatlon ax^2+b+C= 0 are

(a) real and negative (b) real and positive (c) rational numb rs (d) none

18) The polynomial x^3-kx^2+9x has three real zeros if and only if, k satisfies

(a) |k|≤6 (b) k=0 (c) |k| > 6 (d) |k|≥6

19) According to the rational root theorem, which number is not possible rational root of $4x^7+2x^4-10x^3-5$?

(a) -1 (b) $\frac{5}{4}$ (c) $\frac{4}{5}$ (d) 5

20) If x is real and $\frac{x^2-x+1}{x^2+x+1}$ then

(a) $\frac{1}{3}$ ≤k≤ (b) k≥5 (c) k≤0 (d) none

21) If f and g are polynomials of degrees m and n respectively, and if h(x) =(f 0 g)(x), then the degree of h is

(a) mn (b) m+n (c) m^n (d) n^m

22) The polynomial x^3+2x+3 has

(a) one negative and two real roots (b) one positive and two imaginary roots (c) three real roots (d) no solution

23) If $(2+\sqrt{3})x^2-2x+1+(2-\sqrt{3})x^2-2x-1=\frac{2}{2-\sqrt{3}}$ then x=

(a) 0,2 (b) 0,1 (c) 0,3 (d) 0, √3

24) A zero of x^3 + 64 is

(a) 0 (b) 4 (c) 4i (d) -4

25) The number of positive zeros of the polynomial $\sum_{j=0}^{n} n_{C_r}$ $(-1)^r x^r$ is

(a) 0 (b) n (c) < n (d) r

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A - Answer Key

Answer All the questions 25 x 1 = 25

1) (c) 4
2) (b) n -1
3) (b) one of the rots is 1
4) (a) no solution
5) (c) 2
6) (c) b^2 - 4ac >0
7) (a) 2
8) (a) n distinct roots
9) (a) 0
10) (a) $-\frac{q}{r}$
11) (c) a<0
12) (c) p-√q
13) (a) (x - ∝)(x -β) =0
14) (d) $\frac{-2}{3}$
15) (b) c<0
16) (c) at least two solution
17) (b) real and positive
18) (d) |k|≥6
19) (b) $\frac{5}{4}$
20) (a) $\frac{1}{3}$ ≤k≤
21) (a) mn
22) (a) one negative and two real roots
23) (a) 0,2
24) (d) -4
25) (b) n

PATTUKKOTTAI PALANIAPPAN MATHS

INVERSE TRIGONAMETRIC FUNCTIONS

12th Standard EM

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1) $sin^{-1}\frac{3}{5}-cos^{-1}\frac{12}{13}+sec^{-1}\frac{5}{3}-cosec^{1-}\frac{13}{2}$is equal to

(a) 2π (b) π (c) 0 (d) tan$^{-1}\frac{12}{65}$

2) If $sin^{-1}x-cos^{-1}x=\frac{\pi}{6}$ then

(a) $\frac{1}{2}$ (b) $\frac{\sqrt{3}}{2}$ (c) $\frac{-1}{2}$ (d) none of these

3) sin^{-1}(cos x)= $\frac{\pi}{2}-x$ is valid for

(a) $-\pi\le x\le 0$ (b) $0\pi\le x\le 0$ (c) $-\frac{\pi}{2}\le x\le\frac{\pi}{2}$ (d) $-\frac{\pi}{4}\le x\le\frac{3\pi}{4}$

4) If $\alpha=tan^{-1}\left(tan\frac{5\pi}{4}\right)$ and $\beta=tan^{-1}\left(-tan\frac{2\pi}{3}\right)$ then

(a) $4\alpha=3\beta$ (b) $3\alpha=4\beta$ (c) $\alpha-\beta=\frac{7\pi}{12}$ (d) none

5) The equation tan^{-1}x-cot^{-1}x=tan$^{-1}\left(\frac{1}{\sqrt{3}}\right)$ has

(a) no solution (b) unique solution (c) two solutions (d) infinite number of solutions

6) If cot−1x=$\frac{2\pi}{5}$ for some x∈R, the value of tan^{-1} x is

(a) $\frac{-\pi}{10}$ (b) $\frac{\pi}{5}$ (c) $\frac{\pi}{10}$ (d) $-\frac{\pi}{5}$

7) sin(tan^{-1}x), |x|< 1 ia equal to

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

8) If sin^{-1} x+cot^{-1}($\frac{1}{2}$) $=\frac{\pi}{2}$, then x is equal to

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

9) The number of solutions of the equation $tan^{-1}2x+tan^{-1}3x=\frac{\pi}{4}$

(a) 2 (b) 3 (c) 1 (d) none

10) If cot^{-1} 2 and cot^{-1} 3 are two angles of a triangle, then the third angle is

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

11) $sin^{-1}\left(tan\frac{\pi}{4}\right)-sin^{-1}\left(\sqrt{\frac{3}{x}}\right)=\frac{\pi}{6}$.Then x is a root of the equation

(a) x^2−x−6=0 (b) x^2−x−12=0 (c) x^2+x−12=0 (d) x^2+x−6=0

12) The domain of the function defined by f(x)=sin$^{-1}\sqrt{x-1}$ is

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

13) If $cot^{-1}\left(\sqrt{sin\alpha}\right)+tan^{-1}\left(\sqrt{sin\alpha}\right)=u$, then cos2u is equal to

(a) tan$^2\alpha$ (b) 0 (c) -1 (d) tan2α

14) If x=$\frac{1}{5}$, the valur of cos (cos^{-1}x+2sin^{-1}x) is

(a) $-\sqrt{\frac{24}{25}}$ (b) $\sqrt{\frac{24}{25}}$ (c) $\frac{1}{5}$ (d) -$\frac{1}{5}$

15) The value of sin^{-1} (cos x),0≤ $x\le\pi$ is

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

16) The number of real solutions of the equation $\sqrt{1+cos2x}=2sin^{-1}(sinx)$, $-\pi<x<\pi$ is

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

17) $tan^{-1}\left(\frac{1}{4}\right)+tan^{-1}\left(\frac{2}{11}\right)$ =

(a) 0 (b) $\frac{1}{2}$ (c) -1 (d) none

18) If $\sin^{-1}\frac{x}{5}+cosec^{-1}\frac{5}{4}=\frac{\pi}{2}$, then the value of x is

(a) 4 (b) 5 (c) 2 (d) 3

19) If $\sin^{-1}x+\sin^{-1}y+\sin^{-1}z=\frac{3\pi}{2}$, the value of $x^{2017}+y^{2018}+z^{2019}-\frac{9}{x^{101}+y^{101}+z^{101}}$ is

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

20) If $\sin^{-1}x+\sin^{-1}y=\frac{2\pi}{3}$; then $\cos^{-1}x+\cos^{-1}y$ is equal to

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

21) If $\sin^{-}1x = 2\sin^{-1}\alpha$ has a solution, then

(a) $|\alpha|\le\frac{1}{\sqrt{2}}$ (b) $|\alpha|\ge\frac{1}{\sqrt{2}}$ (c) $|\alpha|<\frac{1}{\sqrt{2}}$ (d) $|\alpha|>\frac{1}{\sqrt{2}}$

22) If the function $f(x)\sin^{-1}(x^2-3)$, then x belongs to

(a) [-1,1] (b) $[\sqrt{2},2]$ (c) $\left[-2,-\sqrt{2}\right]\cup\left[\sqrt{2},2\right]$ (d) $\left[-2,-\sqrt{2}\right]\cap\left[\sqrt{2},2\right]$

23) $tan^{-1}\left(\frac{1}{4}\right)+tan^{-1}\left(\frac{2}{3}\right)$is equal to

(a) $\frac{1}{2}cos^{-1}\left(\frac{3}{5}\right)$ (b) $\frac{1}{2}sin^{-1}\left(\frac{3}{5}\right)$ (c) $\frac{1}{2}tan^{-1}\left(\frac{3}{5}\right)$ (d) $tan^{-1}\left(\frac{1}{2}\right)$

24) $\sin^{-1}(2\cos^2x-1)+\cos^{-1}(1-2\sin^2x)$=

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

25) If $|x|\le 1$, then $2\tan^{-1}x-\sin^{-1}\frac{2x}{1+x^2}$ is equal to

(a) $\tan^{-1}x$ (b) $\sin^{-1}x$ (c) 0 (d) π

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PATTUKKOTTAI PALANIAPPAN MATHS

INVERSE TRIGONAMETRIC FUNCTIONS

12th Standard EM

Maths - A

Reg.No. :

P.A.PALANIAPPAN,MSc.,MPhil.,BEd.,
PG ASST IN MATHS
GBHSS-PATTUKKOTTAI
THANJAVUR DIST
9443407917

Time : 00:30:00 Hrs

Total Mark : 25

A - Answer Key

Answer All the questions

25 x 1 = 25

25 x 1 = 25

1) (c) 0
2) (b) $\frac{\sqrt{3}}{2}$
3) (b) $0\pi \le x \le 0$
4) (a) $4\alpha = 3\beta$
5) (b) unique solution
6) (c) $\frac{\pi}{10}$
7) (d) $\frac{x}{\sqrt{1+x^2}}$
8) (b) $\frac{1}{\sqrt{5}}$
9) (a) 2
10) (b) $\frac{3\pi}{4}$
11) (b) $x^2-x-12=0$
12) (a) [1,2]
13) (c) -1
14) (d) $-\frac{1}{5}$
15) (c) $\frac{\pi}{2} - x$
16) (a) 0
17) (a) 0
18) (d) 3
19) (a) 0
20) (b) $\frac{\pi}{3}$
21) (a) $|\alpha| \le \frac{1}{\sqrt{2}}$
22) (c) $\left[-2, -\sqrt{2}\right] \cup \left[\sqrt{2}, 2\right]$
23) (d) $tan^{-1}\left(\frac{1}{2}\right)$
24) (a) $\frac{\pi}{2}$
25) (c) 0

PATTUKKOTTAI PALANIAPPAN MATHS

TWO DIMENSINONAL ANALYTICAL GEOMENTRY

12th Standard EM

Reg.No. :

MATHS - A

P.A.PALANIAPPAN,MSc.,MPhil.,BEd.,

PG ASST IN MATHS

GBHSS-PATTUKKOTTAI

THANJAVUR DIST

9443407917

Time : 00:30:00 Hrs

Total Mark : 25

Answer All the questions

25 x 1 = 25

1) If x+y=k is a normal to the parabola y^2 =12x, then the value of k is

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

2) The length of the diameter of the circle which touches the x -axis at the point (1,0) and passes through the point (2,3) .

(a) $\frac{6}{5}$ (b) $\frac{5}{3}$ (c) $\frac{10}{5}$ (d) $\frac{3}{5}$

3) The centre of the circle inscribed in a square formed by the lines $x^2-8x-12=0$ and $y^2-14y+45 = 0$ is

(a) (4,7) (b) (7,4) (c) (9,4) (d) (4,9)

4) The area of quadrilateral formed with foci of the hyperbolas $\frac{x^2}{a^2}-\frac{y^2}{b^2}=1$ and $\frac{x^2}{a^2}-\frac{y^2}{b^2}=-1$

(a) $4(a^2+b^2)$ (b) $2(a^2+b^2)$ (c) a^2+b^2 (d) $\frac{1}{2}(a^2+b^2)$

5) The equation of the normal to the circle $x^2+y^2-2x-2y+1=0$ which is parallel to the line 2x+4y=3 is

(a) x+2y=3 (b) x+2y+3= 0 (c) 2x+4y+3=0 (d) x−2y+3= 0

6) Consider an ellipse whose centre is of the origin and its major axis is along x-axis. If its eccentrcity is $\frac{3}{5}$ and the distance between its foci is 6, then the area of the quadrilateral inscribed in the ellipse with diagonals as major and minor axis of the ellipse is

(a) 8 (b) 32 (c) 80 (d) 40

7) An ellipse hasOB as semi minor axes, F and F′ its foci and the angle FBF′ is a right angle. Then the eccentricity of the ellipse is

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

8) The locus of a point whose distance from (-2,0) is $\frac{2}{3}$ times its distance from the line x = $\frac{-9}{2}$ is

(a) a parabola (b) a hyperbola (c) an ellipse (d) a circle

9) The ellipse E1$\frac{x^2}{9}+\frac{y^2}{4}=1$ is inscribed in a rectangle R whose sides are parallel to the coordinate axes. Another ellipse E2 passing through the point(0,4) circumscribes the rectangle R . The eccentricity of the ellipse is

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

10) The circle x^2+y^2=4x+8y+5intersects the line3x−4y=m at two distinct points if

(a) 15< m < 65 (b) 35< m < 85 (c) −85< m < −35 (d) −35< m < 15

11) If the two tangents drawn from a point P to the parabolay2 = 4xare at right angles then the locus of P is

(a) 2x+1=0 (b) x = −1 (c) 2x−1=0 (d) x =1

12) If the coordinates at one end of a diameter of the circle $x^2+y^2-8x-4y+c=0$ are (11,2) , the coordinates of the other end are

(a) (-5,2) (b) (2,-5) (c) (5,-2) (d) (-2,5)

13) The radius of the circle passing through the point(6,2) two of whose diameter arex+y=6 and x+2y=4 is

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

14) The eccentricity of the hyperbola whose latus rectum is 8 and conjugate axis is equal to half the distance between the foci is

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

15) Let C be the circle with centre at(1,1) and radius =1. If T is the circle centered at(0, y) passing through the origin and touching the circleC externally, then the radius of T is equal to

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

16) If P(x, y) be any point on $16x^2+25y^2=400$ with foci F1 (3,0) and F2 (-3,0) then PF_1 PF_2 + is

(a) 8 (b) 6 (c) 10 (d) 12

17) Tangents are drawn to the hyperbola $\frac{x^2}{9}+\frac{y^2}{4}=1$ 1parallel to the straight line2x−y=1. One of the points of contact of tangents on the hyperbola is

(a) $\frac{9}{2\sqrt{2}}, \frac{-1}{\sqrt{2}}$ (b) $\frac{-9}{2\sqrt{2}}, \frac{1}{\sqrt{2}}$ (c) $\frac{9}{2\sqrt{2}}, \frac{1}{\sqrt{2}}$ (d) $(3\sqrt{3}, -2\sqrt{2})$

18) If the normals of the parabola $y^2 = 4x$ drawn at the end points of its latus rectum are tangents to the circle $(x-3)^2+(y+2)^2=r^2$, then the value of r^2 is

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

19) The equation of the circle passing through(1,5) and (4,1) and touching y -axis is $x^2+y^2-5x-6y+9+(4x+3y-19)=0$ whereλ is equal to

(a) $0, -\frac{40}{9}$ (b) 0 (c) $\frac{40}{9}$ (d) $\frac{-40}{9}$

20) The equation of the circle passing through the foci of the ellipse $\frac{x^2}{16}+\frac{y^2}{9}=1$ 1having centre at (0,3) is

(a) $x^2+y^2-6y-7=0$ (b) $x^2+y^2-6y+7=0$ (c) $x^2+y^2-6y-5=0$ (d) $x^2+y^2-6y+5=0$

21) Area of the greatest rectangle inscribed in the ellipse $\frac{x^2}{a^2}+\frac{y^2}{b^2}=1.$ is

(a) 2ab (b) ab (c) $\sqrt{ab}$ (d) $\frac{a}{b}$

22) The values of m for which the line y=mx+ $2\sqrt{5}$ touches the hyperbola $16x^2-9y^2=144$ are the roots of $x^2-(a+b)x-4=0$, then the value of (a+b) is

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

23) The radius of the circle$3x^2+by^2+4bx-6by+b^2=0$ is

(a) 1 (b) 3 (c) $\sqrt{10}$ (d) $\sqrt{11}$

24) The eccentricity of the ellipse $(x-3)^2+(y-4)^2=\frac{y^2}{9}$ is

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

25) The circle passing through(1,-2) and touching the axis of x at (3,0) passing through the point

(a) (-5,2) (b) (2,-5) (c) (5,-2) (d) (-2,5)

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PATTUKKOTTAI PALANIAPPAN MATHS

TWO DIMENSINONAL ANALYTICAL GEOMENTRY

12th Standard EM

Reg.No. : | | | | | |

MATHS - A

P.A.PALANIAPPAN,MSc.,MPhil.,BEd.,
PG ASST IN MATHS
GBHSS-PATTUKKOTTAI
THANJAVUR DIST
9443407917

Time : 00:30:00 Hrs

Total Mark : 25

A - Answer Key

Answer All the questions 25 x 1 = 25

1) (d) 9
2) (c) $\frac{10}{5}$
3) (a) (4,7)
4) (b) $2(a^2+b^2)$
5) (a) x+2y=3
6) (d) 40
7) (a) $\frac{1}{\sqrt{2}}$
8) (c) an ellipse
9) (c) $\frac{1}{2}$
10) (d) $-35<m<15$
11) (b) x = −1
12) (b) (2,-5)
13) (b) $2\sqrt{5}$
14) (c) $\frac{2}{\sqrt{3}}$
15) (d) $\frac{1}{4}$
16) (c) 10
17) (c) $\frac{9}{2\sqrt{2}}, \frac{1}{\sqrt{2}}$
18) (a) 2
19) (a) $0, -\frac{40}{9}$
20) (a) $x^2+y^2-6y-7=0$
21) (a) 2ab
22) (c) 0
23) (c) $\sqrt{10}$
24) (b) $\frac{1}{3}$
25) (c) (5,-2)

PATTUKKOTTAI PALANIAPPAN MATHS

APPLICATIONS OF VECTOR ALGEBRA

12th Standard

MATHS

Reg.No. :

P.A.PALANIAPPAN,MSc.,MPhil.,BEd.,
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Time : 00:30:00 Hrs Total Marks : 25

Answer All the questions 25 x 1 = 25

1) If $\vec{a}=2\hat{i}+3\hat{j}-\hat{k},\vec{b}=\hat{i}+2\hat{j}+5\hat{k},\vec{c}=3\hat{i}+5\hat{j}-\hat{k}$ then a vector perpendicular to $\vec{a}$ and lies in the plane containing $\vec{b}$ and $\vec{c}$ is

(a) $-17\hat{i}+21\hat{j}-9\hat{7k}$ (b) $17\hat{i}+21\hat{j}-12\hat{3k}$ (c) $-17\hat{i}-21\hat{j}+19\hat{7k}$ (d) $-17\hat{i}-21\hat{j}-19\hat{7k}$

2) If $\vec{a}$ and $\vec{b}$ are unit vectors such that $[\vec{a},\vec{b},\vec{a}\times\vec{b}]=\frac{\pi}{4}$, then the angle between $\vec{a}$ and $\vec{b}$ is

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

3) Distance from the origin to the plane 3x - 6y + 2z 7 = 0 is

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

4) If $\vec{a}$ and $\vec{b}$ are parallel vectors, then $[\vec{a},\vec{c},\vec{b}]$ is equal to

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

5) The vector equation $\vec{r}=(\hat{i}-2\hat{j}-\hat{k})+t(6\hat{i}-\hat{k})$ represents a straight line passing through the points

(a) (0,6,1)– and (1,2,1) (b) (0,6,-1) and (1,4,2) (c) (1,-2,-1) and (1,4,-2) (d) (1,-2,-1) and (0,-6,1)

6) If the planes $\vec{r}=(2\hat{i}-\lambda\hat{j}+\hat{k})=3$ and $\vec{r}=(4+\hat{j}-\mu\hat{k})=5$ are parallel, then the value of λ and μ are

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

7) The coordinates of the point where the line $\vec{r}=(6\hat{i}-\hat{j}-3\hat{k})+t(\hat{i}+4\hat{j})$ meets the plane $\vec{r}=(\hat{i}+\hat{j}-\hat{k})$ = 3 are

(a) (2,1,0) (b) (7,1,7) (c) (1,2,6) (d) (5,1,1)

8) If $\vec{a},\vec{b},\vec{c}$ are three unit vectors such that $\vec{a}$ is perpendicular to $\vec{b}$ and is parallel to $\vec{c}$ then $\vec{a}\times(\vec{b}\times\vec{c})$ is equal to

(a) $\vec{a}$ (b) $\vec{b}$ (c) $\vec{c}$ (d) $\vec{0}$

9) The volume of the parallelepiped with its edges represented by the vectors $\hat{i}+\hat{j},\hat{i}+2\hat{j},\hat{i}+\hat{j}+\pi\hat{k}$ is

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

10) If the distance of the point (1,1,1) from the origin is half of its distance from the plane x + y + z + k =0, then the values of k are

(a) ±3 (b) ±6 (c) -3, 9 (d) 3, 9

11) If a vector $\vec{\alpha}$ lies in the plane of $\vec{\beta}$ and $\vec{\gamma}$, then

(a) $[\vec{\alpha},\vec{\beta},\vec{\gamma}]$ = 1 (b) $[\vec{\alpha},\vec{\beta},\vec{\gamma}]$= -1 (c) $[\vec{\alpha},\vec{\beta},\vec{\gamma}]$= 0 (d) $[\vec{\alpha},\vec{\beta},\vec{\gamma}]$= 2

12) $\vec{a}.\vec{b}=\vec{b}.\vec{c}=\vec{c}.\vec{a}=0$, then the value of $[\vec{a},\vec{b},\vec{c}]$ is

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

13) If the volume of the parallelepiped with $\vec{a}\times\vec{b},\vec{b}\times\vec{c},\vec{c}\times\vec{a}$ as coterminous edges is 8 cubic units, then the volume of the parallelepiped with $(\vec{a}\times\vec{b})\times(\vec{b}\times\vec{c}),(\vec{b}\times\vec{c})\times(\vec{c}\times\vec{a})$ and $(\vec{c}\times\vec{a})\times(\vec{a}\times\vec{b})$ as coterminous edges is,

(a) 8 cubic units (b) 512 cubic units (c) 64 cubic units (d) 24 cubic units

14) The angle between the line $\vec{r}=(\hat{i}+2\hat{j}-3\hat{k})+t(2\hat{i}+\hat{j}-2\hat{k})$ and the plane $\vec{r}.(\hat{i}+\hat{j})+4=0$ is

(a) 0° (b) 30° (c) 45° (d) 90°

15) If the direction cosines of a line are $\frac{1}{c},\frac{1}{c},\frac{1}{c}$, then

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

16) If $\vec{a} = \hat{i} + \hat{j} + \hat{k}, \vec{b} = \hat{i} + \hat{j}, \vec{c} = \hat{i}$ and $(\vec{a} \times \vec{b}) \times \vec{c} = \lambda\vec{a} + \mu\vec{b}$ then the value of $\lambda + \mu$ is

(a) 0 (b) 1 (c) 6 (d) 3

17) If $[\vec{a}, \vec{b}, \vec{c}] = 1, \frac{\vec{a}.(\vec{b}\times\vec{c})}{(\vec{c}\times\vec{a}).\vec{b}} + \frac{\vec{b}.(\vec{c}\times\vec{a})}{(\vec{a}\times\vec{b}).\vec{c}} + \frac{\vec{c}.(\vec{a}\times\vec{b})}{(\vec{c}\times\vec{b}).\vec{a}}$ is

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

18) Consider the vectors $\vec{a}, \vec{b}, \vec{c}, \vec{c}$ such that $(\vec{a} \times \vec{b}) \times (\vec{c} \times \vec{d}) = \vec{0}$ Let P_1 and P_2 be the planes determined by the pairs of vectors $\vec{a}, \vec{b}$ and $\vec{c}, \vec{d}$ respectively. Then the angle between P_1 and P_2 is

(a) 0° (b) 45° (c) 60° (d) 90°

19) The distance between the planes x + 2y + 3z + 7 = 0 and 2x + 4y + 6z + 7 = 0

(a) $\frac{\sqrt{7}}{2\sqrt{2}}$ (b) $\frac{7}{2}$ (c) $\frac{\sqrt{7}}{2}$ (d) $\frac{7}{2\sqrt{2}}$

20) If $\vec{a} \times (\vec{b} \times \vec{c}) = (\vec{a} \times \vec{b}) \times \vec{c}$ where $\vec{a}, \vec{b}, \vec{c}$ are any three vectors such that $\vec{a}, \vec{b} \neq 0$ and $\vec{a}.\vec{b} \neq 0$ then $\vec{a}$ and $\vec{c}$ are

(a) perpendicular (b) parallel (c) inclined at an angle $\frac{\pi}{3}$ (d) inclined at an angle $\frac{\pi}{6}$

21) If $\vec{a}, \vec{b}, \vec{c}$ are three non-coplanar vectors such that $\vec{a} \times (\vec{b} \times \vec{c}) = \frac{\vec{b}+\vec{c}}{\sqrt{2}}$, then the angle between

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

22) If $\vec{a}, \vec{b}, \vec{c}$ are non-coplanar, non-zero vectors such that $[\vec{a}, \vec{b}, \vec{c}] = 3$, then $\{[\vec{a} \times \vec{b}, \vec{b} \times \vec{c}, \vec{c} \times \vec{a}]\}^2$ is equal to

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

23) The angle between the lines $\frac{x-2}{3} = \frac{y+1}{-2}$, z=2 and $\frac{x-1}{1} = \frac{2y+3}{3} = \frac{z+5}{2}$

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

24) If the line $\frac{x-2}{3} = \frac{y-1}{-5} = \frac{x+2}{2}$ lies in the plane x + 3y + - αz + β = 0, then (α, β) is

(a) (-5, 5) (b) (-6, 7) (c) (5, 5) (d) (6, -7)

25) If the length of the perpendicular from the origin to the plane 2x + 3y + λz =1, λ > 0 is $\frac{1}{5}$ then the value of λ is

(a) $2\sqrt{3}$ (b) $3\sqrt{2}$ (c) 0 (d) 1

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PATTUKKOTTAI PALANIAPPAN MATHS

APPLICATIONS OF VECTOR ALGEBRA

12th Standard EM

Reg.No. :

MATHS - A

P.A.PALANIAPPAN,MSc.,MPhil.,BEd.,
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Time : 00:30:00 Hrs

Total Mark : 25

A - Answer Key

Answer All the questions 25 x 1 = 25

1) (d) $-17\hat{i}-21\hat{j}-197\hat{k}$
2) (a) $\frac{\pi}{6}$
3) (b) 1
4) (d) 0
5) (c) (1,-2,-1) and (1,4,-2)
6) (c) $-\frac{1}{2},-2$
7) (d) (5,1,1)
8) (b) $\vec{b}$
9) (c) π
10) (d) 3, 9
11) (c) $[\vec{\alpha},\vec{\beta},\vec{\gamma}]=0$
12) (a) $|\vec{a}|\,|\vec{b}|\,|\vec{c}|$
13) (c) 64 cubic units
14) (c) 45°
15) (b) $c=\pm\sqrt{3}$
16) (a) 0
17) (c) 2
18) (a) 0°
19) (a) $\frac{\sqrt{7}}{2\sqrt{2}}$
20) (b) parallel
21) (b) $\frac{3\pi}{6}$
22) (a) 81
23) (d) $\frac{\pi}{2}$
24) (b) (-6, 7)
25) (a) $2\sqrt{3}$