

ASSIGNMENT -1

COMPLEX NUMBER

- 1) Evaluate (i) i^{365} (ii) $i^{17} + i^{20} - i^{13}$ (iii) i^{45} (iv) i^{-999}
- 2) Evaluate x and y from $(x-3y)+5i=5+(3x+y)i$
- 3) Find conjugate of (i) $(1+i)$ (ii) $6i-3$
- 4) If $z_1=5+7i$, $z_2=9-3i$ find (i) z_1+z_2 (ii) z_1-z_2 (iii) $z_1 z_2$ (iv) z_1 / z_2
- 5) Find Modulus and argument/amplitude of $z=1+\sqrt{3}i$.

Also express in polar form.

- 6) Write conjugate and modulus of (i) $1/3+5i$ (ii) $3+4i$
- 7) Write in logarithmic form
(i) $\log$ (i) $10^3=1000$ (ii) $4^{-2}=\frac{1}{16}$ (iii) $27^{1/3}=3$
- 8) Write in exponential form
(i) $\log_{10} 100=2$ (ii) $\log_8 256=\frac{8}{3}$
- 9) Prove that $\log_y x \times \log_z y \times \log_x z = 1$
- 10) Find x , if $\log_x 343=3$
- 11) Solve $\log 3 + \log(x+1) = \log(2x+7)$
- 12) Prove that $\log x + \log 3 = \log(2x+4)$

ASSIGNMENT-2

BINOMIAL THEOREM

- 1) Evaluate ${}^{20}P_4$
- 2) Evaluate $9!/4!5!$
- 3) Evaluate $\frac{8! - 6!}{3!}$
- 4) Evaluate $7!/4!$
- 5) Find n , if $nC_6 = nC_4$
- 6) Compute $\frac{11! - 10!}{9!}$
- 7) Formula of nPr and nCr
- 8) If $(n+2)! = 60(n-1)!$ find n
- 9) If $nPr = 360$, find n
- 10) How many terms are in $((x-5y)^5)^3$, $(x^2+3y^2)^6$, $(x+y)^{-7}$,
- 11) Find 5th term of $(2x^2 - \frac{1}{3x})^{11}$.
- 12) Find 10th term in $(2x^2 + \frac{1}{x})^{12}$.
- 13) Expand $(\frac{2x}{3} + \frac{3}{2x})^4$ by using Binomial Theorem.
- 14) Find Middle term in $(\frac{3}{x^2} - \frac{x^3}{6})^9$.
- 15) Expand $(2x+3y)^5$ by using Binomial Theorem.
- 16) Expand $(2+3y)^{-3}$ upto four terms.
- 17) Expand $(1+2y)^{-4}$ upto three terms.

ASSIGNMENT - 3

MATRICES AND DETERMINANTS

1) Define i) Square Matrix ii) Identity Matrix iii) Zero Matrix

2) Find order of Matrix

(i) $\begin{bmatrix} 1 & 0 & 2 \\ -1 & 3 & 1 \end{bmatrix}$ (ii) $\begin{bmatrix} 1 \\ 2 \end{bmatrix}$ (iii) $\begin{bmatrix} 1 & 2 & 5 \end{bmatrix}$

3) If $A = \begin{bmatrix} 1 & -1 \\ 2 & 3 \end{bmatrix}$, $B = \begin{bmatrix} 0 & 6 \\ 1 & 9 \end{bmatrix}$ find $4A - 3B$

4) Construct a matrix of order 2×3 where $a_{ij} = 2i + j$

5) If $\begin{bmatrix} x & 3x-y \\ 2x+z & 3y-w \end{bmatrix} = \begin{bmatrix} 3 & 2 \\ 4 & 7 \end{bmatrix}$ find x, y, z, w .

6) If $A = \begin{bmatrix} 2 & 4 \\ 3 & 2 \end{bmatrix}$, $B = \begin{bmatrix} 1 & 3 \\ -2 & 0 \end{bmatrix}$ find AB and BA

7) If $f(x) = x^2 - 4x + 1$, find $f(A)$ when $A = \begin{bmatrix} 2 & 1 \\ 3 & 2 \end{bmatrix}$

8) If $\begin{bmatrix} 1 & -4 \\ 1 & 2 \end{bmatrix} \begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} 3 \\ 1 \end{bmatrix}$ find x and y .

9) If $\begin{vmatrix} 2x & 5 \\ 1 & 3 \end{vmatrix} = 7$, find x .

10) Solve by using CRAMER'S RULE (DETERMINANT RULE)

i) $x + 2y = 3$

ii) $3x + 4y = 5$

$2x - y = 1$

$x - y = -3$

ASSIGNMENT - 3

MATRICES AND DETERMINANTS

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10) Solve by using CRAMER'S RULE (DETERMINANT RULE)

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ASSIGNMENT-4

TRIGNOMETRY

- 1) Convert $\frac{\pi}{2}$ radian into degree.
- 2) In which quadrant 870° lie?
- 3) $\sin 70^\circ \cos 10^\circ + \cos 70^\circ \sin 10^\circ =$
- 4) $2\sin A \cos B =$
- 5) Convert into sum or difference
 - i) $2\cos 4\theta \cos 2\theta$
 - ii) $4\sin \theta \sin 6\theta$
- 6) Convert into products
 - i) $\cos 3\theta + \cos 7\theta$
 - ii) $\sin 4\theta + \sin 2\theta$
- 7) Prove that
$$\cos 20^\circ \cos 40^\circ \cos 80^\circ = 1/8$$
- 8) Evaluate i) $\tan 15^\circ$ ii) $\cos 75^\circ$ iii) $\sin 105^\circ$
- 9) If $\cos A = 5/13$, $\sin B = 4/5$, find $\sin (A+B)$.
- 10) Prove that $\tan 13A \tan 9A \tan 4A = \tan 13A - \tan 9A - \tan 4A$
- 11) The angle of elevation of top of hill at foot of tower is 60° and the angle of elevation of top of tower from foot of hill is 30° . If tower is 50 m high then find height of hill.

ASSIGNMENT -5

POINTS AND STRAIGHT LINE

- 1) In which quadrant points lie i) (3,4) ii) (-3,-4) iii) (3,-4) iv) (-3,4)
- 2) Find length between points (4,7) and (2,6)
- 3) Find midpoint of (3,6) and (7,9)
- 4) Find centroid of triangle whose vertices are (1,3) (2,4) (-6,5)
- 5) Find angle between lines whose slopes are 2 and $\frac{1}{2}$
- 6) Find slope of line which is parallel to line having slope 4.
- 7) If lines are perpendicular then their slopes are_____.
- 8) Find equation of line passing through (1,2) and (2,3).
- 9) Find equation of line passing through (3,4) and having slope 4.
- 10) Find perpendicular distance from (1,3) on line $2x+4y-7=0$.
- 11) Transform $2x+3y+6=0$ into i) slope intercept form
ii) intercepts form
- 12) Change into cartesian co ordinate $(2, -\frac{\pi}{4})$
- 13) Change into Polar co ordinate $(2, 2\sqrt{3})$

ASSIGNMENT-6

CIRCLE AND SOFTWARE

- 1) Find Equation of Circle having centre at (1,3) and radius 3
- 2) Find centre and radius of circle
 - i) $4x^2+4y^2-10x+5y+5=0$
 - ii) $x^2+y^2-2x-6y-6=0$
- 3) Find equation of circle passing through points (5,7) (6,6) (5,5)
- 4) Find the centre and radius from equation $(x-3)^2+(y-4)^2=9$
- 5) Find the equation of circle whose end points are (1,6) and (5,12)
- 6) Write the introduction to MATLAB in 100-120 words.
- 7) Scilab is a _____.
- 8) Write the difference between MATLAB and SCILAB .