Q.22 A curve is drawn to pass through the points given by the following table

X	1	1.5	2	2.5	3	3.5	4
Y	2	2.4	2.7	2.8	3	2.6	2.1

Find the area bounded by the curve, the x-axis- and lines $x=1$ to $x=4$ (using Trapezoidal Rules)

Section-D

Note: Long answer type questions. Attempt any two questions out of three questions. (2x8=16)

Q.23 If $A=\begin{bmatrix}2 & 4\\ 3 & 2\end{bmatrix}$, $B=\begin{bmatrix}1 & 3\\ -2 & 5\end{bmatrix}$ and $C=\begin{bmatrix}-2 & 5\\ 3 & 4\end{bmatrix}$

Find (i) AB (ii) BC

Q.24 The angles of elevation of the top of a rock from the top and foot of 100m high tower are respectively 30° and 45°. Find the height of the rock.

Q.25 Expand $(X^3+3Y)^5$ by using binomial theorem.

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Section-A

Note: Multiple Choice questions. All questions are compulsory. (6x1=6)

Q.1 The conjugate of $\frac{1}{2+i}$ is

(a) $\frac{2+i}{5}$ (b) $\frac{2-i}{5}$

(c) $\frac{1}{2-i}$ (d) $\frac{5}{2+i}$

Q.2 $\underset{x\to 0}{Lim}\ \frac{\sin 5x}{\tan 3x}$

(a) $\frac{2}{3}$ (b) $\frac{5}{3}$

(c) $\frac{3}{2}$ (d) $\frac{3}{5}$

Q.3 The co-ordinates (7,-3) lies in which quadrant

(a) Ist (b) IInd

(c) III (d) IV

Q.4 The value of tan 135° is

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

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

Q.5 The logarithmic form of $10^3 = 1000$ is

(a) $10\ log\ 1000 = 3$ (b) $3 = log_{10}\ 1000$

(c) $log_{10}\ 1000 = 10$ (d) None of the above

Q.6 The value of $\frac{8!}{6! \times 2!}$ is

(a) 12 (b) 18

(c) 28 (d) 48

Section-B

Note: Objective/Completion type questions. All question are compulsory. (6x1=6)

Q.7 $\frac{d}{dx}(\tan x) =$ _____

Q.8 $\int (x^2-3x+4)\ dx =$ _____

Q.9 Cos (A+B) = _____

Q.10 MATLAB is a _____ language

Q.11 Mode of the data 110, 120, 130, 120, 110, 140, 130, 120, 140, 120 is _____

Q.12 $\int x^8\ dx =$ _____

Section-C

Note: Short answer type questions. Attempt any eight questions out of ten questions. (8x4=32)

Q.13 Find the multiplicative inverse of $\frac{(3-2i)(2+3i)}{(2+i)(2-i)}$

Q.14 If $y=(x+3)(x^2-4)$ find $\frac{dy}{dx}$.

Q.15 Expand the binomial $\left(3x+\frac{1}{3x}\right)^3$.

Q.16 Solve X+Y = 2, X-Y = 0 by Cramer's rule.

Q.17 Find the mean deviation from mean and its coefficient for the following frequency distribution.

X	5	7	9	10	12	15
f	8	6	2	2	2	6

Q.18 Find the equation of the circle whose centre is at (4,5) and passes through centre of the circle $X^2+Y^2+4X-6Y-12=0$

Q.19 Evaluate $\int_0^{\pi/2} \int Sin^4x\ Cos^3x\ dx$

Q.20 Prove that Sin51° + Cos81° = Cos21°.

Q.21 Find the center and radius of the circle $X^2+Y^2-4X-8Y-45=0$