Q.21 From a point on the ground, 20m away from the foot of the tower, the angle of elevation of the top of the tower is 30°, Find height of the tower. (CO-3)

Q.22 Find the eqation of line which passes through the points (2, –5) and (–6, –4). (CO-3)

Section-D

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

Q.23 Find mean deviation for the following distribution (CO-5)

x_i	5	7	9	10	12	15
f_i	8	6	2	2	2	6

Q.24 Apply Simpson's Rule to evaluate $\int_1^9 (x+1)\,dx$ by taking eight equal intervals. (CO-4)

Q.25 Solve the following equation using Cramer's rule (CO-2)

$$5x+3y=13$$
$$x-4y=-2$$

Roll No. .....

Ist Year
Branch: Advance Diploma in Tool and Die Making
Subject : Applied Mathematics

Time : 3 Hrs. M.M. : 60

Section-A

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

Q.1 i^6 _____. (CO-2)

(a) 1 (b) –1 (c) i (d) $-i$

Q.2 $\log_e m+\log_e n=$ _____ (CO-2)

(a) $\log_e(m\,n)$ (b) $\log_e(m/n)$

(c) $\log_e(m+n)$ (d) $\log_e(m-n)$

Q.3 In which quadrant the point (–2, 1) lies? (CO-2)

(a) 1st (b) 3rd

(c) 2nd (d) 4th

Q.4 What is the order of the following differential equation? (CO-1)

$$\frac{d^3y}{dx^3}-3\frac{d^2y}{dx^2}+4\frac{dy}{dx}=0$$

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

Q.5 $\int \sin x \, dx =$ _____ (CO-4)

(a) $\cos x + c$ (b) $-\cos x + c$

(c) $\sin x + c$ (d) $-\sin x + c$

Q.6 What is the mean of the data:

3, 3, 6, 10, 13 (CO-5)

(a) 6 (b) 3

(c) 7 (d) None of these

Section-B

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

Q.7 $\tan 60° =$ _____ (CO-3)

Q.8 Find the conjugate of $z = -5 + 4i$ (CO-2)

Q.9 $\lim\limits_{x \to 0} \dfrac{\sin x}{x} =$ _____ (CO-1)

Q.10 The file saved in *SCILAB* is with extension _____. (CO-5)

Q.11 $\int \sec^2 x \, dx =$ _____ (CO-4)

Q.12 Find the value of ${}^6C_2$. (CO-2)

Section-C

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

Q.13 If $A = \begin{bmatrix} -3 & 2 \\ 4 & -5 \end{bmatrix}$ and $B = \begin{bmatrix} 3 & 7 \\ -1 & 2 \end{bmatrix}$

then find $2A - 3B$. (CO-1)

Q.14 Prove that:

$\tan 12x - \tan 8x - \tan 4x = \tan 12x \tan 8x \tan 4x$ (CO-3)

Q.15 Write four differences between *MATLAB* and *SCILAB*. (CO-5)

Q.16 Evaluate $\lim\limits_{x \to 3} \dfrac{x^2 - 9}{x - 3}$ (CO-1)

Q.17 Expand $(2x + 3y)^4$ by using binomial theorem. (CO-2)

Q.18 Differentiate $y = x^2 . \log x$ with respect to x. (CO-1)

Q.19 Find the area bounded by the curve $y = x^2$, the x — axis and the ordinates $x = 1$ & $x = 3$. (CO-4)

Q.20 Find the equation of the circle whose centre is (–3, 4) and radius is 5. (CO-3)