Section-D

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

Q.23 a) Prove that: (CO-2)

$$\log\frac{11}{5}+\log\frac{14}{3}-\log\frac{22}{15}=\log 7$$

b) The radius of a circle is increasing at the rate of $0.2 cm/sec$. What is the rate of increase of area if $r=5cm$. (CO-4)

Q.24 Using Trapezoidal Rule, evaluate $\int_1^5 (x^2+1)\,dx$ by taking four equal intervals. (CO-4)

Q.25 Find the mean deviation for the following frequency distribution. (CO-5)

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

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1st Year / 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 $\lim_{x\to 0}\frac{\sin x}{x}=$ (CO-1)

(a) 0 (b) 1

(c) -1 (d) ∞

Q.2 The order of differential equation (CO10)

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

(a) 2 (b) 3

(c) 4 (d) 1

Q.3 Value of tan 60° is :- (CO-3)

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

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

Q.4 The mean of individual series: 4, 6, 8, 10 (CO-5)

(a) 6 (b) 7

(c) 8 (d) 4

Q.5 The number of terms in binomial expansion $(x+3y)^7$ is (CO-2)

(a) 6 (b) 7

(c) 8 (d) 9

Q.6 The order of the matrix $\begin{bmatrix} 4 & 6 \\ 3 & 1 \end{bmatrix}$ is (CO-1)

(a) 1×2 (b) 2×1

(c) 2×2 (d) 2×3

Section-B

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

Q.7 Define row matrix. (CO-1)

Q.8 What is the general term of binomial theorem for positive index. (CO-2)

Q.9 If $A=\begin{bmatrix} 9 & 4 \\ 3 & 0 \end{bmatrix}, B=\begin{bmatrix} 6 & 5 \\ 3 & 2 \end{bmatrix}$, find A - B. (CO-1)

Q.10 Factorize: $x^2 - 9$ (CO-1)

Q.11 Find the mode for individual series 9, 8, 7, 9, 6 (CO-5)

Q.12 Find the slope of the line which passing through the points (4,3) and (6,8). (CO-3)

Section-C

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

Q.13 Evaluate: $\lim_{x\to 0} \frac{\tan 2x}{\sin 3x}$ (CO-1)

Q.14 Differentiate $y = x^2.e^x$ with respect to x. (CO-1)

Q.15 Expand $(2x+3y)^4$ by using binomial theorem. (CO-2)

Q.16 Evaluate: ${}^7P_3$ and ${}^8C_3$ (CO-2)

Q.17 Find the area under the curve $y=2x^2$ when $0 \le x \le 4$. (CO-4)

Q.18 Differentiate between MATLAB and SCILAB. (CO-5)

Q.19 Find the equation of circle having centre at (2,3) and radius=4 (CO-3)

Q.20 Show that : (CO-3)

$\tan 13A - \tan 9A - \tan 4A = \tan 13A \tan 9A \tan 4A$

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 mean for the following data (CO-5)

x	8	10	12	14	16
f	4	6	8	5	4