Q.22 Find fifth term in expansion of $\left(2x^2 - \frac{1}{3x}\right)^{11}$ (CO-2)

Section-D

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

Q.23 a) Find the rate of change of area of circle with respect to its radius when $r = 5cm$. (CO-4)

b) Apply Cramer's Rule or Determinant Rule to solve the following system of linear equations : (CO-1)

$x + 2y = 2$

$2x + 3y = 3$

Q.24 Use Trapezoidal rule to estimate $\int_0^7 x^2 dx$ by taking eight ordinates. (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

(**Note:** Course outcome/CO is for office use only)

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222012

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 The number of terms is expansion of $(a+b)^5$. (CO-2)

(a) 5 (b) 6

(c) 7 (d) 4

Q.2 $\lim_{x \to 0} \frac{a^x - 1}{x} =$ (CO-1)

(a) *log a* (b) *log x*

(c) not defined (d) $\log \frac{a}{x}$

Q.3 The Radian measure of 90° is (CO-3)

(a) π (b) $\frac{\pi}{2}$

(c) $\frac{\pi}{4}$ (d) 2π

Q.4 The mode of individual series : 3, 6, 9, 6, 12, 15, 6 (CO-5)

(a) 3 (b) 6

(c) 12 (d) 5

Q.5 The degree of differential equation : $\frac{dy}{dx} = \sin x$ (CO-1)

(a) 1 (b) 2

(c) 3 (d) none of these

Q.6 The order of the matrix $\begin{bmatrix} 2 \\ 3 \\ 1 \end{bmatrix}$ is (CO-1)

(a) 3×1 (b) 1×3

(c) 3×3 (d) 1×1

Section-B

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

Q.7 Give the formula for general term in expansion of $(x+y)^n$. (CO-2)

Q.8 If $A = \begin{bmatrix} 2 & 3 \\ 7 & 9 \end{bmatrix}$, $B = \begin{bmatrix} 0 & 1 \\ 0 & 1 \end{bmatrix}$, find $A+B$ (CO-1)

Q.9 Solve $2^3 \times 2^2$. (CO-1)

Q.10 Find the distance between two points: (3,5) & (6,9) (CO-3)

Q.11 Find the median for series 4,7,9,12,13,17,20 (CO-5)

Q.12 Write intercept form of straight line. (CO-3)

Section-C

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

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

Q.14 Differentiate $y = x^3 \cdot \sin x$ with respect to x. (CO-1)

Q.15 Find 5th term in expansion of $\left(x + \frac{1}{x}\right)^{12}$. (CO-2)

Q.16 Find n if $\frac{1}{9!} + \frac{1}{10!} = \frac{n}{11!}$ (CO-2)

Q.17 Find the area under the curve $y = 4x^2$ when $0 \le x \le 3$. (CO-4)

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

Q.19 Find the equation of circle having centre at (3, -2) and *radius* = 5. (CO-3)

Q.20 Show that : (CO-3)

$\tan 9A - \tan 5A - \tan 4A = \tan 9A \tan 5A \tan 4A$

Q.21 A tower stand vertically on the ground. From a point on the ground, 20m away from the foot of the tower is 60°. What is the height of the tower? (CO-3)