1st Year / Common

Subject : Applied Mathematics

Time : 3 Hrs. M.M. : 60

SECTION-A

Note: Objective type questions. All questions are compulsory. (10x1=10)

Q.1 Fill in the blank:

If $f(x)=x^2-1$, then $f(2)=$ _____ (CO10)

Q.2 Fill in the blank: $\lim_{x\to 0}\frac{a^x-1}{x}=$ _____ (CO10)

Q.3 Fill in the blank: $\frac{d}{dx}(\tan x)=$ _____ (CO10)

Q.4 Fill in the blank: $\int x^3 dx=$ _____ (CO12)

Q.5 Fill in the blank: $\int \sec^2 x dx=$ _____ (CO12)

Q.6 Fill in the blank: $\int a^x dx=$ _____ (CO12)

Q.7 Fill in the blank: $\int_0^2 x dx=$ _____ (CO14)

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Q.8 Give an example of non-linear differential equation. (CO17)

Q.9 The mean of the data 5,7,3,9,6 is _____ (CO18)

Q.10 What is the formula to find Standard Deviation for Raw data: $x_1, x_2, x_3, \ldots, x_n$ (CO18)

SECTION-B

Note: Very Short answer type questions. Attempt any five questions out of seven questions. (5x2=10)

Q.11 Define even function with an example. (CO10)

Q.12 If $y=x^5$, find $\frac{d^2y}{dx^2}$. (CO10)

Q.13 Evaluate $\int_0^{\frac{\pi}{2}}\cos^5 x dx$ (CO14)

Q.14 Check whether the differential equation

$\frac{d^2y}{dx^2}+\frac{dy}{dx}-y=0$ is linear or non-linear. (CO17)

Q.15 Find the order and degree of the differential equation

$\frac{d^2y}{dx^2}-y^3=0$ (CO17)

Q.16 Calculate the arithmetic mean (A.M.) for the following data:

x	2	3	1	4	5
f	5	7	2	3	3

(CO18)

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Q.17 Calculate the mode for the following data

4,6,5,8,4,5,9,5,7,6,9,10 (CO18)

SECTION-C

Note: Short answer type questions. Attempt any six questions out of eight questions. (6x24=24)

Q.18 Evaluate $\lim_{x \to 0} \frac{\sin 8x}{2x}$ (CO10)

Q.19 Differentiate $y = \sin x.e^x$ with respect to x. (CO10)

Q.20 Find the rate of change of the area of the circle with respect to its radius r when $r = 6m$. (CO10)

Q.21 Evaluate $\int (1 + 2\sin x - \cos x)dx$ (CO12)

Q.22 Find the area under the curve

$y = 3x^2 + 2x - 1$, when $1 \le x \le 2$. (CO15)

Q.23 Solve the differential equation $\frac{dy}{dx} = \cos x$ (CO17)

Q.24 Calculate the median for the following data: (CO18)

24, 22, 32, 37, 18, 20, 12, 21, 15, 30,14, 11

Q.25 In a quiz competition, two judges accorded following ranks to the 10 participants: (CO18)

1st Judge	10	9	8	7	6	5	4	3	2	1
2nd Judge	5	3	7	1	9	4	2	8	10	6

Find the Coefficient of Rank Correlation

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SECTION-D

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

Q.26 find the points of maxima and minima and the corresponding maximum and minimum values of the function

$f(x) = x^3 - 12x^2 + 5$ (CO11)

Q.27 Using Trapezoidal rule, evaluate (CO16)

$\int_0^7 x^2 dx$

by taking 7 equal intervals.

Q.28 Find the mean deviation about mean for the following ungrouped data (CO18)

x_i	3	5	7	9	11	13
f_i	2	7	10	9	5	2

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