Roll No._____ **ID: 220022/212822**

Semester: 2nd

Branch: Automobile, Chemical, Chem P&P, Civil, Computer, Electrical, ECE, Instrumentation & Control engg., Mechanical, Mechanical (Tool & die Design), Automation & Robotics, Medical electronics, Artificial Intelligence & Machine Learning

Subject: Applied Mathematics-II

Time: 3hrs. **Max Marks 60**

Section –A

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

Q.1 If $f(x) = \frac{x-1}{x+2}$ then $f(3) =$ (CO-01)

(a) $\frac{1}{5}$ (b) $\frac{2}{5}$

(c) $\frac{3}{5}$ (d) $\frac{4}{5}$

Q.2 $\frac{d}{dx}(e^x) =$ (CO-01)

(a) e^x (b) e^{-x}

(c) $\frac{1}{x}$ (d) none of these

Q.3 What is the order of following differential equation: $\frac{d^2y}{dx^2} + y = 0$ (CO-01)

(a) 1 (b) 2

(c) 3 (d) none of these

Q.4 The command line used in SCILAB begins with (CO-05)

(a) // (b) \\

(c) % (d) none of these

Q.5 $\int sinx\, dx =$ (Co-02)

(a) $cosx + c$ (b) $-cosx + c$

(c) $sinx + c$ (d) $-sinx + c$

Q.6 What is the mean of the data: 3,6,9,12,15 (CO-04)

(a) 9 (b) 5

(c) 15 (d) 3

Section-B

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

Q7. $\lim_{x\to 0} \frac{e^x-1}{x} =$ _____ (CO-01)

Q8. $\int sec^2x\, dx = \tan x$ (True/False) (CO-02)

Q9. Check whether the given differential equation is linear or not

$\frac{d^2y}{dx^2} + \frac{dy}{dx} + 3x = 0$ (CO-01)

Q10. Find the mean of 9,10,12,14,16 (CO-04)

Q11. The file saved in SCILAB is with extension _____. (CO-05)

Q12. Write down the formula to find area using Trapezoidal Rule. (CO-03)

Section-C

Note: Short answer type Questions. Attempt any eight questions out of ten questions.

8x4= 32

Q13. Evaluate: $\lim_{x\to 0} \frac{x^2-9}{x-3}$ (CO-01)

Q14. Find $\frac{d^2y}{dx^2}$ if $y = tanx + secx$ (CO-01)

(CO-02)

Q15. (a) Find median of the series 4,6,7,11,18

(b) Write down the SCILAB symbol for logical operators (i) OR (ii) AND (CO-05)

Q16. Differentiate $y = x^2 \quad logx$ with respect to x . (CO-01)

Q17. Differentiate between MATLAB and SCILAB. (CO-05)

Q18. Find the area bounded by the curve $y = x^2$, the $x - axis$ and the ordinates $x = 1 \,\&\, x = 3$. (CO-03)

Q19. $\int (x^2 + 1)dx$ (CO-01)

Q20. Evaluate the following: $\frac{\int_0^{\frac{\pi}{2}} sin^7 x\, dx}{\int_0^{\frac{\pi}{2}} cos^6 x\, dx}$ (CO-02)

Q21. Describe four disadvantages of SCILAB. (CO-05)

Q22. Find mode for the following frequency distribution. (CO-04)

Rent (in Rs.)	20-40	40-60	60-80	80-100	100-120	120-140	140-160
No. of hours	6	9	11	14	20	15	10

Section-D

Note: Long answer questions. Attempt any two questions out of three questions.

2X8=16

Q23. Find all the points of maxima and minima and their corresponding maximum and minimum values of the function $y = 2x^2 - 15x^2 + 36x + 10$ (CO-02)

Q24. Apply Simpson's Rule to evaluate $\int_1^9 (x + 1)dx$ by taking eight equal intervals. (CO-03)

Q25. Find mean deviation for the following distribution (CO-04)

x_i	110	150	120	250	300	350
f_i	4	8	10	20	15	3