BMATS201 Lab IA Viva Questions - Answers

1. The command pprint() is used for:

To neatly print data structures using the sympy library.

2. Command used to integrate a function:

from sympy import integrate

integrate(function, variable)

3. Library words used in Python:

numpy, sympy, matplotlib, scipy

4. Why numpy & sympy:

numpy - numerical operations

sympy - symbolic math (integration, differentiation)

5. Why matplotlib:

Used to plot graphs and data visualizations.

6. '#' symbol:

Used to write comments in Python.

7. Why lambdify:

To convert sympy expressions to numerical functions using numpy.

8. How to set coordinate system:

Using axis(), xlim(), ylim() in matplotlib.

9. Beta and Gamma relation:

Beta(m,n) = [Gamma(m) * Gamma(n)] / Gamma(m+n)

10. Linear transformation:

T(x) = A * x (matrix multiplication)

11. Rank of a Matrix:

np.linalg.matrix_rank(matrix)

12. Dimension of a vector:

len(vector) or vector.shape

13. Command to return zero array:

numpy.zeros((rows, columns))

14. Rank-nullity theorem:

Rank(A) + Nullity(A) = No. of columns in A

15. Dot product command:

numpy.dot(a, b)

16. Why append():

To add an element to the end of a list.

17. Trapezoidal method:

from scipy.integrate import trapezoid

trapezoid(y_values, x_values)

18. Regula-Falsi formula:

x = (a*f(b) - b*f(a)) / (f(b) - f(a))

19. Runge-Kutta 4th order:

y_{n+1} = y_n + (1/6)(k1 + 2k2 + 2k3 + k4)

20. Simpson's 1/3rd rule with 7 ordinates:

(h/3)[y0 + y6 + 4(y1 + y3 + y5) + 2(y2 + y4)], where h = (b-a)/6