TDC (CBCS) Second Semester Examination :: 2020

Sub: Mathematics :: Paper: C-202-LAB

Name of the Paper: Differential Equations (Practical)

Max. Marks: 30

Answer any five questions: $5 \times 6 = 30$

1. Solve the following DEs:
   (a) $ydx - xdy + (1 + x^2)dx + x^2 \sin y dy = 0$.
   (b) $\frac{dy}{dx} + x \sin 2y = x^3 \cos^2 y$.
2. State and solve exponential growth model of population.
3. Compute the solution of lake pollution model.
4. In a lake, the pollution level is 5% and the fresh water is allowed to enter at the rate of 10000 litres per day and the same amount of water leaves the lake. Find the time when pollution level is 2.5% if volume of lake is 500000 litres.
5. Compute the solution of drug assimilation model for single pill.
6. Solve the following DE:
$$(D^2 + D - 2)y = c^x.$$
7. Solve the DE
$$\frac{d^2y}{dx^2} + y = \sec x$$
using the method of variation of parameters.
8. Solve the following system of simultaneous DEs:
$$\frac{dx}{dt} - 7x + y = 0;$$
$$\frac{dy}{dt} - 2x - 5y = 0.$$

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TDC (CBCS) Fourth Semester Examination :: 2020

Sub: Mathematics :: Paper: C-401-LAB

Name of the Paper: Numerical Methods (Practical)

Max. Marks: 30

Write C programs for any five of the following: $5 \times 6 = 30$

1. To solve the quadratic equation $ax^2 + bx + c = 0$.
2. To generate Fibanacci sequence.
3. To find the sum of the following series:
$$\frac{1}{1+1^2} + \frac{1}{1+2^2} + \cdots + \frac{1}{1+n^2}.$$
4. To find the factorial of a given number.
5. To find the prime factors of a given number.
6. For sorting a numerical array.
7. For computing the product of two matrices.
8. For finding the solution of a system of linear equations using Gaussian elimination method.

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