DOON UNIVERSITY, DEHRADUN
End Semester Examination, IInd Semester, 2024
Academic Year 2023-24 (Even Semester)
School of Technology, Department Name - Computer Science & Engineering
Programme Name - B.Sc.(Hons with Research) CS, IVth Semester
Course Code with Title: CSC252 - Numerical & Statistical Computing

Time Allowed 2.00 Hours   Maximum Marks: 30

SECTION: A
(Each question carry 3 marks)

1. Evaluate the value of y for x = 1925. The values of y are given below for different values of x using Newton Backward Interpolation.

x	1891	1901	1911	1921	1931
y	46	66	81	93	101

2. Determine the solution for y when x = 2.2. Here, different values of y are given below for different values of x using Gauss Forward Interpolation.

x	1	2	3	4
y	1	8	27	64

SECTION: B
(Each question carry 4 marks)

1. Integrate $\int_0^6 x^2 dx$ using Trapezoidal Rule, Simpson ⅓ Rule and Weddle's Rule for six iterations.

2. Find the approximate solution of y for x = 0.2 for a single iteration where y(0) = 0 and f(x,y) = x+y² using Runge Kutta Order 4 method.

3. Find the solution for f'''(3) where y have different values for different values of x which are shown below:

x	2	4	6
y	7	9	18

SECTION: C
Attempt any two questions
(Each question carry 6 marks)

1. Given $y(20) = 512$, $y(30) = 439$, $y(40) = 346$, $y(50) = 243$, find $y(35)$ using Stirling's method.
2. Find $y(0.2)$ for $y' = -xy^2$, $y(0) = 1$, with step length 0.1 using the Modified Euler Method.
3. Find solution using Newton Divided Difference method for $x = 2.7$ where some values of y are given below for values of x:

x	2	2.5	3
y	0.7	0.9	1.1