

BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(END SEMESTER EXAMINATION)

CLASS: ISc
BRANCH: PHYSICS

SEMESTER : IV
SESSION : SP/2025

SUBJECT: SEC303 COMPUTATIONAL PHYSICS SKILLS

TIME: 3 Hours

FULL MARKS: 50

INSTRUCTIONS:

1. The question paper contains 5 questions each of 10 marks and total 50 marks.
 2. Attempt all questions.
 3. The missing data, if any, may be assumed suitably.
 4. Before attempting the question paper, be sure that you have got the correct question paper.
 5. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.
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Q.1(a)	Write bash commands to	[6]	1 2
	(a) find if the string 'this book' is contained in the file 'test.txt'.		
	(b) Remote login to a computer (IP address 172.16.23.1) as user 'user'.		
	(c) Copy a folder 'data_to_copy' from the remote computer to your computer. (Use details in (b).)		
Q.1(b)	Discuss the algorithm to determine if a given integer is prime.	[4]	1 3
Q.2	Outline Euler's method. Write an algorithm to solve the following first order differential equation: $\frac{dx}{dt} = a - bx$ using Euler's method.	[10]	2 3
Q.3	Write down the algorithm (Flowchart/Pseudocode) for bubble sort. Use it to sort the following data: [5,19,1,83,7,46,92].	[10]	3 3
Q.4	What are floats in a latex document? Discuss how to insert them in a document (use documentclass 'article').	[10]	4 2
Q.5(a)	Write down the syntax to plot 'sin(x)' in either Gnuplot or Python-Matplotlib. Set the x-axis range [0,2], y-axis range [0,10], and the curve title to 'sin(x)'. Also, set the title of the plot as 'Plot of sin(x)'.	[5]	5 3
Q.5(b)	Consider a noisy data contained in a file 'data.txt'. Write the syntax to fit the function $f(x) = a + bx + ce^{-kx}$ in Gnuplot.	[5]	5 3

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