

QP Code: D133757		Total Pages: 2	Name:
		Register No.	
<b>THIRD SEMESTER UG DEGREE EXAMINATION, NOVEMBER 2025</b>			
(CUFYUGP)			
PHY3CJ202 /APH3CJ202: COMPUTATIONAL PHYSICS			
2024 Admission onwards			
Maximum Time :2 Hours		Maximum Marks :70	
<b>Section A</b>			
<b>All Questions can be answered. Each Question carries 3 marks (Ceiling : 24 Marks)</b>			
1	Write an algorithm to find the largest among three numbers.		
2	Explain the role of eval() in Python with an example.		
3	List any three differences between Tuple and List in Python.		
4	Write the syntax of the flow of control statements (simple if, if-else, nested if) with example		
5	Write the output of the following: <pre>x = [2, 4, 6] print(x*2)</pre>		
6	Define discretisation in numerical methods with an example from experiments.		
7	State Newton's forward difference interpolation formula.		
8	What is the principle behind the least squares method of curve fitting?		
9	Mention two limitations of Euler's method for solving ODEs.		
10	What is the advantage of Numerov's method?		
<b>Section B</b>			
<b>All Questions can be answered. Each Question carries 6 marks (Ceiling : 36 Marks)</b>			
11	Write an algorithm and corresponding Python program to compute factorial of a number.		
12	Using formatted printing in Python, display the following:  <pre>Name: Alan, Age: 20, Score: 85.50</pre>		
13	Write a Python program to generate 10 random numbers using NumPy and compute their mean and standard deviation.		
14	Given the data: (x, y) = (1,1), (2,4), (3,9). Perform Newton's forward interpolation to find y at x = 2.5.		
15	Fit a straight line of the form $y = ax + b$ using least squares for the data: (1, 2), (2, 3), (3, 5). Find a and b.		
16	Use the trapezoidal rule to approximate $\int_0^1 e^x dx$ using 4 intervals.		
17	Apply Euler's method with step size $h = 0.1$ to solve $dy/dx = -2y$ , $y(0) = 1$ , at $x = 0.2$ .		
18	Discuss the Monte-Carlo method of finding the value of $\pi$ . Develop a python code for it.		

<b>Section C</b>	
<b>Answer any ONE .Each Question carries 10 marks (1x10=10 Marks)</b>	
19	Explain different file handling operations in Python with examples. Illustrate with a program that writes and reads student data from a file.
20	Discuss the importance of numerical integration in experimental physics. Compare trapezoidal and Simpson's 1/3 rule with examples.