



QP CODE: 20100432

Reg No :

Name :

BSc DEGREE (CBCS) EXAMINATION, MARCH 2020
Sixth Semester

Choice Based Core Course - PH6CBT03 - COMPUTATIONAL PHYSICS

B.Sc Physics Model I, B.Sc Physics Model II Computer Applications, B.Sc Physics Model III
Electronic Equipment Maintenance, B.Sc Physics Model II Applied Electronics

2017 Admission Onwards

3897A7BA

Time: 3 Hours

Marks: 80

Part A

*Answer any **ten** questions.*

*Each question carries **2** marks.*

1. What is meant by pivotal equation?
2. What is a lower triangular matrix?
3. Which are the two iterative methods for the solution of a system of linear algebraic equations?
4. What is Gauss-Seidel iterative method?
5. What do you mean by least square fitting?
6. Explain the least square method to fit an exponential function.
7. Explain any two difference operators.
8. Write down Newton's interpolation polynomial.
9. Write a general quadrature formula for equidistant ordinates.
10. Write Taylor's series formula.
11. What is the other name for Heuns method?
12. Write down the second order R-K algorithm.



(10×2=20)

Part B

Answer any **six** questions.

Each question carries **5** marks.

13. Find a root of the equation $x^3 - 3x - 5 = 0$ by the method of false position.
14. Use the secant method to estimate the root of the equation $x^2 - 4x - 10 = 0$ with the initial estimates of $x_1 = 4$ and $x_2 = 2$.
15. Locate root of the equation $x^2 + x - 2 = 0$ using the fixed point method.
16. Prove that $f(4) = f(3) + \Delta f(2) + \Delta^2 f(1) + \Delta^3 f(1)$.
17. Use Lagrange's formula to find the value of y at $x = 6$ from the following data.

x	3	7	9	10
y	168	120	72	63

18. Find the first two derivatives of $x^{1/3}$ at $x=50$ and $x=56$ given the table below:

x	50	51	52	53	54	55	56
$y = x^{1/3}$	3.6840	3.7084	3.7325	3.7563	3.7798	3.8030	3.8259

19. Find the value of x for which y is minimum and find the minimum value from the table.

x	0.60	0.65	0.70	0.75
y	0.6221	0.6155	0.6138	0.6170

20. Evaluate $\int_0^1 e^x dx$ by Simpson's one-third rule correct to five decimal places, by proper choice of h .
21. Given $y' = -y$ and $y(0) = 1$, determine the values of y at $x = (0.01), (0.02), (0.03)$ and (0.04) by Euler method.

(6×5=30)

Part C

Answer any **two** questions.

Each question carries **15** marks.



22. Find a root of the following equation using the bisection method $x \log_{10} x = 1.2$ lying between 2 and 3.
23. Find a positive root of each of the following equation using Newton-Raphson method $4x - e^x = 0$.

24. Using Newton's divided difference formula evaluate $f(8)$ given that

x	4	5	7	10	11	13
f(x)	48	100	294	900	1210	2028

25. Evaluate $\int_{-3}^3 x^4 dx$ by using Trapezoidal rule and verify the results by actual integration.

(2×15=30)

