25074

M.Sc. DEGREE EXAMINATION, APRIL 2018.

Physics

SECOND SEMESTER

Paper IV — COMPUTATIONAL METHODS AND PROGRAMMING

Time : Three hours Maximum : 75 marks

(No additional sheet will be supplied)

PART A — (5 × 3 = 15 marks)

Answer any FIVE questions.

Each answer carries 3 marks.

Each question should not exceed 1 page.

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1. State and Explain conditional operators in C-language with examples.

2. Explain the statements :

   (a) BREAK

   (b) CONTINUE with examples.

3. Explain Logical operators in MATLAB with example.

4. Write strings with examples in MATLAB.

5. State and Explain Bisection method.

6. Write C-language programme for gauss-elimination method.

7. Using Lagrange's Interpolation method find the value of the function $f(x)$ at $x = 40$.

x	30	35	45	55
$f(x)$	148	96	68	34

8. Evaluate $\int_0^5 f(x)dx$ using Simpson's One-third rule formula :

x	1	2	3	4	5
$f(x)$	13	50	70	80	100

PART B — (4 × 15 = 60 marks)

Answer any FOUR questions.

Each answer carries 15 marks.

Each question should not exceed 6 pages.

9. Discuss the different data types used 'C' language with examples.

10. What is array? Explain different types of arrays with examples in C-language.

11. Write about Elementary math functions and matrix functions in MATLAB.

12. What is MATLAB? Explain its features and Applications of MATLAB.

13. Explain Newton Rhapson method. Write a computer oriented programme and algorithm to find the smallest positive root of the equation $f(x) = 0$, using Newton Rhapson method.

14. Explain Gauss-Sidel method for solving simultaneous algebraic equations. Write computer oriented algorithm and corresponding to solve a system of linear algebraic equations.

15. State Newton's forward interpolation. Write computer oriented algorithm to interpolate and extrapolate using given pairs of values of 'x' and 'y' by Newton's forward interpolation.

x	1	2	3	4	7
$f(x)$	2	4	8	16	128

16. Explain Trapezoidal rule. Write a computer oriented algorithm and corresponding C Programme for Trapezoidal rule.

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