PHS S2 Supp 16/09/2025 Lib

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Reg. No. : .....

Name : .....

Second Semester M.Sc. Degree Examination, August 2025

Physics / Physics with Specialization in Space Physics/ Physics with Specialization in Nano Science

PHSP 523 / PHNS 523 / PH 223 : COMPUTER SCIENCE AND NUMERICAL TECHNIQUES

(2020 Admission Onwards)

Time : 3 Hours Max. Marks : 75

PART – A

Answer any **five** questions. Each question carries **3** marks.

1. Explain the role of registers in CPUs.
2. Distinguish between static RAM and dynamic RAM.
3. What is meant by a microcontroller?
4. How is file-input and output is handled in python?
5. Explain the difference between structures and classes in C++?
6. Explain how is the inverse of a matrix numerically computed?
7. What is Interpolation?
8. Write a python code for adding first 10 natural numbers.

(5 x 3 = 15 Marks)

PART – B

Answer **three** questions. Each question carries **15** marks.

9. (a) Discuss addressing modes in 8085. 9

   (b) Briefly discuss various layers in computer network model. 6

OR

10. (a) Explain the basic control flow operations in python, with examples. 9

    (b) Write a program in python to illustrate Euler method for solving a first order ordinary differential equation. 6

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11. (a) Briefly discuss the file operations in C++. **9**

(b) Discuss how functions are created in C++ and how passing arguments to functions in C++. **6**

OR

12. (a) What are the basic features of object oriented programming? Briefly explain how is objects are created and used in C++. **9**

(b) Illustrate creation of classes and objects in C++ using a program. **6**

13. (a) Derive trapezoid rule, and Simpson's 3/8 rules. **9**

(b) Write a program to illustrate trapezoidal rule. **6**

OR

14. (a) Discuss how a two dimensional Laplace equation is solved numerically? **9**

(b) Discuss Gaussian elimination in a tridiagonal system. **6**

(3 × 15 = 45 Marks)

PART – C

Answer any **three** questions. Each question carries **5** marks.

15. Explain various computer network topologies.

16. Write an assembly language program in 8085 for adding three numbers.

17. Write a C++ code for multiplying two matrices (only loop structure required).

18. Explain the use of pointers in C++ by using an example.

19. Derive central difference formulae for first order and second order derivatives?

20. Discuss how Euler's method is used to solve one dimensional harmonic oscillator problem to determine position and velocity of the particle.

(3 × 5 = 15 Marks)
