

Reg. No. : .....

Name : .....

**Second Semester M.Sc. Degree Examination, July 2019**

**Physics**

**Special Paper – II**

**PH 223 : COMPUTER SCIENCE AND NUMERICAL TECHNIQUES**

**(2018 Admission)**

Time : 3 Hours

Max. Marks : 75

**PART – A**

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

- I. (a) Distinguish mnemonics from assembly language.
- (b) How does a microprocessor differentiate data and instruction code.
- (c) What are triples in python?
- (d) What is a memory?
- (e) What are modifiers in C++?
- (f) Explain the logical flow of 'if-else' statements in C++.
- (g) Discuss the method of finding the solutions of simultaneous linear algebraic equations with Gauss-Jordan elimination method.
- (h) Write and explain Lagrange interpolation formula.

**(5 × 3 = 15 Marks)**



## PART – B

Answer **all** questions. Each carries **15** marks.

II. A. (a) Discuss memory classification. 9

(b) Explain use of lists in python. 6

OR

B. (a) Discuss the bus organisation in 8085. 9

(b) Briefly explain the idea of memory interfacing in 8085. 6

III. A. (a) What are functions in C++? 6

(b) Using an example, distinguish calling function from called function in C++. 9

OR

B. (a) Discuss loop statements in C++. 9

(b) Write down the precedence of logical operations in C++. 6

IV. A. (a) Obtain the Simpson's 3/8 formula. 6

(b) Solve the differential equation  $\frac{dy}{dx} = -y$  with the condition  $y(0) = 1$ , and find  $y(0.03)$  using Runge-Kutta method. Find the error, if the exact solution is given as  $y = e^{-x}$ . 9

OR

B. (a) Starting with Newton's forward interpolation formula discuss the method of finding the numerical integral of a function. 8

(b) Derive second order Runge-Kutta formula and from Euler's formula. 7



PART – C

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

- V. (a) Briefly describe how computer networks are classified.
- (b) Discuss the role of operating system.
- (c) Explain the functioning of 'while' loop in python.
- (d) Write a C++ code for printing the sum  $S = 1 + 2 + 3 + \dots + 10$ , using a for loop.
- (e) Briefly explain the use of pointers in C++.
- (f) Evaluate  $I = \int_0^1 \frac{1}{1+x} dx$ , using the Simpson's 1/3 rule, taking  $h = 0.125$ .
- (g) Explain the Stirling's formula.

(3 × 5 = 15 Marks)

