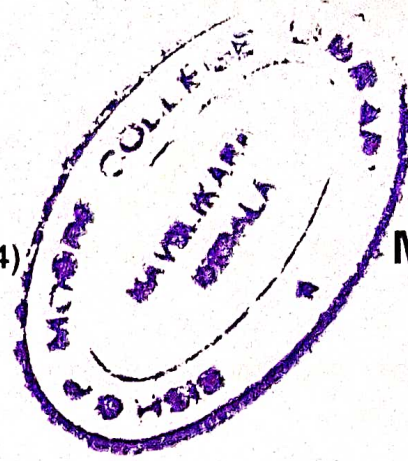


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M – 5440

Reg. No. :

Name :



Second Semester M.Sc. Degree Examination, November 2021

Physics

PH 223 : COMPUTER SCIENCE AND NUMERICAL TECHNIQUES

(2020 Admission)

Time : 3 Hours

Max. Marks : 75

PART – A

Answer any five questions, each question carries 3 marks:

1. Briefly discuss about RAM, ROM and cache memories
2. Briefly discuss about different addressing modes of 8085 microprocessor
3. Interpret the following 8085 commands

LXI H, 1256H

MOV A,M

ADD C

4. What is tuples in Python language
5. Distinguish between C++ classes and objects with a situation where each can be used.

P.T.O.



6. How single and two-dimensional arrays are declared in C++ with one example each
7. Briefly discuss the steps involved in Gauss-Jordan method of finding the inverse of a matrix.
8. Write a short note on central difference interpolation formula.

(5 × 3 = 15 Marks)

PART – B

Answer all questions. Each question carries 15 marks.

9. (a) Discuss with a schematic diagram about functional description of intel microprocessor 8085 narrate the functionalities. 9
- (b) Discuss about addressing modes of 8085 microprocessor 6

OR

10. (a) Briefly discuss about computer architecture, memory and I/O devices (4+5)
- (b) Write a short note on computer networks. 6
11. (a) Discuss the following with reference to the C++ language: conditional statements, switch statements, nested loop with one example along with C commands. (3+3+3)
- (b) Write a C-program for reading a set of 10 data from an input file and check whether the number is a prime number and save the prime numbers to another file. 6

OR

12. (a) Discuss about classes and objects in C++ language with examples. 8
- (b) Write a C++ program for evaluating $\cos(x)$ using series expansion with an accuracy better than 10^{-6} . 7



13. (a) Derive the general quadrature formula and obtain Simpson's 3/8 rule. 9

(b) Compute the integral with Simpson's 3/8 rule. 6

$$\int_b \frac{1}{1+x^2} dx.$$

OR

14. (a) (i) Discuss Runge-Kutta methods for finding numerical solution of ordinary differential equation. 6

(ii) Discuss the steps involved in numerical solution of higher order differential equations. 2

(b) Solve the differential equation $\frac{dx}{dy} = -y$ with condition $y(0)=1$ for $y(0.01)$ with $h = 0.01$ using 4th order Runge-Kutta method. 7

PART – C

Answer any **three** questions, each question carries **5** marks.

15. Write a Python program for summing natural numbers from 1000 and 2000 to a file.

16. Write an assembly language program for adding two 8-bit binary numbers kept in the memory location 1500 H, 1600 H and save the result at 1700 H.

17. Write a C++ program for reading the parameters of a quadratic equation solve it and save the results to another file.



18. Write a C++ program for reading a 3 x 3 matrix and write its transpose to another file.
19. From the set of values given, find the value of $\log^{10}(\pi)$ using the Newton's forward interpolation formula.

X	log x
3.141	0.497068
3.143	0.497344
3.145	0.497621
3.147	0.497897
3.149	0.498173

20. Use Lagrange interpolation formula to find the value of y at $x=4.5$, from the following data.

(3 × 15 = 45 Marks)

