B. Sc. DEGREE END SEMESTER EXAMINATION - APRIL 2021
SEMESTER –6: PHYSICS (CORE COURSE)
COURSE: **15U6CRPHY09: COMPUTATIONAL PHYSICS**

(Common for Regular 2018 Admission & Improvement 2017/Supplementary 2017/2016/2015/2014 Admissions)

Time: Three Hours   Max Marks: 60

PART A (Very short answer questions)
Answer all questions, each question carries 1 Mark

1. The fixed set of instructions in the form of binary patterns for a microprocessor is called-----
2. What is the significance of Timing diagram?
3. Draw the bit positions of various flags in the flag register of 8085.
4. Explain the operation carried out by 8085 µp on the instruction ADD B
5. Write a C++ program to find the remainder of two numbers.
6. What are the advantages of using Object Oriented languages?
7. What are manipulators in C++?
8. Differentiate between the *truncation error* and *rounding off error.*
9. Simpson's 1/3 rule is exact up to _____ order polynomials.
10. For integration using trapezoidal rule, if the interval *h* is halved by what factor the truncation error will be reduced?   (1 x 10 = 10)

PART B (Short answer)
Answer any seven questions each question carries 2 Marks

11. Explain the advantages of an assembly language over high level language.
12. Explain stack pointer in a microprocessor.
13. Explain the syntax of *switch* statement in C++.
14. With a suitable example, explain the use of *functions* in C++.
15. What are secondary memory devices? Give two examples.
16. What is an exit-controlled loop in C++?
17. Why Simpson's 1/3 rule is better than trapezoidal rule for numerical integration?
18. Explain bisection method.
19. Write the Algorithm for false position method.   (2 x 7 = 14)

PART C (Problem/Derivations)
Answer any Four question, each question carries 4 Marks

20. Write an assembly language programme for subtracting two eight-bit numbers and store the result in another memory location using direct addressing.
21. What are different types of buses in a microprocessor unit? Explain.
22. Write a C++ program to check whether the given number is prime or not.
23. Write short notes on various logical and branching operations of 8085.

24. Solve the differential equation $\frac{dy}{dx} + xy = 0, y(0) = 1$, from x=0 to 1, using Euler's method.

25. Find the real root of the equation $x^3 - 4x - 5 = 0$, using false position method.

(4 x 4 = 16)

PART D (Long answer questions)

Answer any Two question, each question carries 10 Marks

26. Draw the pin-out diagram and explain the functions of various pins in an 8085 microprocessor.

27. Explain the syntax and working of various loops in C++. Also give examples.

28. Explain Runge-Kutta fourth order formula and write the Algorithm for computer implementation.

29. Explain Simpson's 1/3 method. Evaluate $\int_0^5 \frac{1}{1+x} dx$, using Simpson's 1/3 method.

(10 x 2 = 20)

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