

B. Sc. DEGREE END SEMESTER EXAMINATION - MARCH 2020**SEMESTER –6: PHYSICS (CORE COURSE)****COURSE: 15U6CRPHY09: COMPUTATIONAL PHYSICS***(Common for Regular 2017 Admission & Supplementary 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. Explain assembly language and high-level language.
2. What is T state?
3. Which are the hardware interrupts of an 8085 microprocessor?
4. Why data bus is bidirectional for 8085 microprocessors?
5. Write a C++ programme to find the modulus of a given number.
6. What are escape sequences in C++. Give examples.
7. Describe the use of *getche()* function in C++.
8. Give the geometrical explanation of Trapezoidal rule.
9. What is the advantage of false position method over bisection method?
10. Write the Euler's formula for numerical solution of differential equations. (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. Differentiate between Programme counter and Stack pointer.
13. Write a C++ programme to print the cubes of the numbers from 1 to 15.
14. What are classes in C++? Explain the syntax.
15. Discuss the output of the conditional operator: $\text{min}=(\alpha<\beta)?\alpha:\beta$;
16. Explain the use of *if-else* statement in C++. Give an example.
17. The proper choice of the initial guess is very important for Newton Raphson method. Why?
18. Derive the expression for the truncation error in the use of trapezoidal rule.
19. For Simpson's integration, if the interval h is halved by what factor the truncation error will be reduced? (2 x 7 = 14)

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

20. Explain different types of instructions in 8085.
21. Write a program using ADI instruction to add two hexadecimal numbers 4AB and 45C.
22. Find the real root of the equation $x^3 - 4x + 5 = 0$ using bisection method
23. Sketch the pin out of 8085 and signals.
24. Write a C++ programme to solve $\frac{dy}{dx} + xy = 0, y(0) = 1$, from $x=0$ to 1, using Euler's method.
25. Write a C++ programme to print the first n terms of Fibonacci series. (4 x 4 = 16)

PART D (Long answer questions)**Answer any Two question, each question carries 10 Marks**

26. Explain addressing modes in 8085
27. Give the syntax of *switch* statement and *if else* statement in C++. Explain the working of both with suitable examples
28. Explain the Newton Raphson method to find the root of an equation. Demonstrate the working of Newton Raphson method by finding the root of equation $x^2-49=0$.
29. a) Explain Simpson's 1/3 rule for numerical integration.
b) Evaluate $\int_0^1 (1 + \sqrt{x}) dx$ using Simpson's 1/3 rule. (10 x 2 = 20)
