

**B. Sc. DEGREE END SEMESTER EXAMINATION - MARCH 2018****SEMESTER – 6: PHYSICS (CORE COURSE)****COURSE: 15U6CRPHY9 –: COMPUTATIONAL PHYSICS***Common for Regular (2015 Admission) & Supplementary (2014 Admission)*

Time: Three Hours

Max. Marks: 60

**PART A** (Very short answer questions)Answer **all** questions. Each question carries **1** Mark

1. Compare CALL and JMP instructions for  $\mu\text{p}$  8085.
2. How many 16 bit registers are there in  $\mu\text{p}$  8085? List them
3. Explain the operation carried out by 8085  $\mu\text{p}$  on the instruction ANA B
4. Define the instruction cycle for microprocessors
5. What is the syntax of *if* statement in C++.
6. Give few examples for escape sequences (escape Characters) in C++
7. What are the types of errors included in numerical calculations?
8. For integration using trapezoidal rule, if the tabulated interval  $h$  is halved, what factor will the (truncation) error reduce?
9. What is the advantage of Simpson's method over trapezoidal rule?
10. With suitable example, explain the use of remainder(%) operator in C++ (1 x 10 = 10)

**PART B** (Short answer)Answer **any Seven** questions. Each question carries **2** Marks

11. Explain one byte, two byte and three byte instructions for 8085  $\mu\text{p}$  using examples for each.
12. Write a C++ program to find the square root of a number
13. What do you mean by cache memory?
14. State when *Switch* statement is preferred over *if else* constructions in C++
15. What are *classes* in C++? Describe the syntax for defining classes with example
16. Proper Choice of the initial guess is very important in Newton Raphson Method. Why?
17. Explain Euler's method for solving differential equations
18. Explain bisection method for numerically finding the root of the equation
19. Define T-state for a microprocessor. (2 x 7 = 14)

**PART C** (Problem/Derivations)Answer **any Four** question. Each question carries **4** Marks

20. Explain microprocessor initiated operations and the communication lines (Bus)
21. Write a program for  $\mu\text{p}$  8085 to add two 8-bit numbers and store the result in a memory location.
22. Write a C++ program to find whether the given number is a prime number.
23. Write a C++ program to solve  $x^3 - 3x - 5 = 0$  using Newton Raphson method.

24. Solve the differential equation  $\frac{dy}{dx} + xy = 0$ ,  $y(0) = 1$ , from  $x=0$  to  $x=0.25$  using second order Runge-Kutta method (use  $h=0.05$ )
25. Write a short note on interrupts of 8085 microprocessor. (4 x 4 = 16)

**PART D** (Long answer questions)

Answer **any Two** question. Each question carries **10** Marks

26. Discuss the internal architecture of 8085 microprocessor
27. Write down the C++ syntaxes for *switch* statement, *structure* specifier and *class* specifier. Explain each one with examples.
28. Explain false position method. Write a C++ program to solve the equation  $x^3-3x-5=0$  using false position method.
29. Explain Trapezoidal and Simpson's method for numerical integration. Also write down the algorithms for computer implementation (10 x 2 = 20)

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