



# UNIVERSITY OF THE PUNJAB

B.S. 4 Years Program / Sixth Semester – 2019

Paper: Computational Physics-I

Course Code: PHY-311 Part – I (Compulsory)

Time: 15 Min. Marks: 10

Roll No. in Fig. ....

Roll No. in Words. ....

Signature of Supdt.:

**ATTEMPT THIS PAPER ON THIS QUESTION SHEET ONLY.**

**Division of marks is given in front of each question.**

**This Paper will be collected back after expiry of time limit mentioned above.**

Q.1. Encircle the correct choice.

(1x10=10)

- i. C++ program statement ends with a:  
a) getch()      (b) void main ()      (c) semicolon (d) comma
- ii. In C++ what is not a selection:  
a) select (b) if (c) switch (d) if-else
- iii. C++ language, LIBRARY TYPE that provides stream oriented input and output is called:  
(a) Header      (b) #include      (c) iostream      (d) both (a) & (b)
- iv. Which of the following is an assignment operator in C++?  
(a) ==      (b) =      (c) +      (d) !=
- v. Which escape sequence can be used to begin a new line in C++:  
(a) \new      (b) \n      (c) \next      (d) \t
- vi. The pow () is a:  
(a) Operator      (b) user defined function (c) built in function (d) None
- vii. In C++, a loop with fix number of iterations is:  
(a) While      (b) do-while      (c) for (d) None
- viii. If  $x = 23$  and  $y = 32$ , then for statement " $y == x$ " which of the following result is true  
(a) x equals y (b) x is greater than y (c) true (d) false
- ix. In C++ the expression  $45\%2$  is evaluated to:  
(a) 2.0 (b) 1 (c) 22.5 (d) error
- x. Which of the following is not a Boolean operator for in C++ :  
(a) &&      (b) ||      (c) =      (d) none



# UNIVERSITY OF THE PUNJAB

B.S. 4 Years Program / Sixth Semester – 2019

Roll No. ....

Paper: Computational Physics-I  
Course Code: PHY-311 Part – II

Time: 2 Hrs. 45 Min. Marks: 50

**ATTEMPT THIS (SUBJECTIVE) ON THE SEPARATE ANSWER SHEET PROVIDED**

<p><b>Q.2.</b></p> <p>i. Explain with example the following terms in C++: a) float x; (b) cos ( ) (c) switch() (d) sqrt()</p> <p>ii. Write syntax with example the following in C++: (a) do-while ( ) loop (b) for ( )</p> <p>iii. Explain arithmetic operators in C++?</p> <p>Write C++ program code segment for the following:</p> <p>(a) to calculate equivalent of two resistors connected in series (b) to print x against f(x) for the equation</p> $f(x) = \frac{5}{\sqrt{2x^3 - 4x^2 - 2x + 4}}$ <p>(c) to calculate and display table of a number (d) to convert grams to kilograms using a function</p>	<p>Write short answers of the following Questions:</p> <p>4</p> <p>4</p> <p>4</p> <p>8</p>	
<p><b>Q.3.</b></p>	<p>Write C++ program to evaluate the <math>\int_1^6 \frac{1}{x^3 - 5} dx</math> by Simpson's rule or by Trapezoidal rule due to options 1 or 2 respectively (use n=6). Report error message for any other option pressed by the user.</p>	<p>10</p>
<p><b>Q.4.</b></p>	<p>Suppose A and B be 3x3 matrices. Write C++ program which reads in entries of A and B and prints out the entries of matrix which is (i) <math>7A - 3B</math> , (ii) <math>C = 2A'</math> and (iii) to print diagonal elements of C.</p>	<p>2+4+4</p>
<p><b>Q.5.</b></p>	<p>Write C++ program for the forced harmonic motion (FHM) of a mass attached with a spring using Euler's method under the following conditions: (<math>g=9.8 \text{ m/s}^2</math>, initial position zero and velocity 15 m/s, time step 0.1 sec. and maximum time 15 sec., <math>k = 1 \text{ N/m}</math>, <math>m=1\text{kg}</math>, damping coefficient = 0.5 N/ms, <math>\omega = 0.01 \text{ s}^{-1}</math> and <math>f_0=1.5\text{N}</math>.) Calculate and print values for time, position, velocity and acceleration. How you can change the same program for Simple H.M., Damped. H.M</p> <p>Write C++ program which reads in 10 numbers into an array and display those numbers in reverse order.</p>	<p>7+3</p>