Q.1.   Answer the following short questions: **(15x2=30)**

1) Give the equivalent of binary number (1100).
2) What are operators?
3) What are the necessary I/O devices for your computer?
4) What is assignment operator?
5) What is difference between bit and byte?
6) Write an algorithm to calculate y such that (e.g $y = 4x^2$)
7) Explain array manipulation
8) Comment on the repetition (loop) in C++.
9) Write C++ program code to generate the data in an array and find its minimum.
10) What is binary search?
11) Write C++ program to display factorial of number seven.
12) Discuss with example of following terms in C++ if loop.
13) What do you know about two-dimensional array?
14) Differentiate between Hardware and Software.
15) What is the difference between a program and an algorithm?

Q.2.   Answer the following questions: **(3x10=30)**

1. The time period of a simple pendulum is given by: $= 2\pi \sqrt{\left(\frac{l}{g}\right)}$.

   Write program to determine and print the time (T) against length (*l*) varies from 1 to 20 meters in steps of 5.
   Take $g = 9.8 \, m/s^2$
   What is a variable declaration in C++? Describe rules for giving variable a name? Declare the variables x and y of integer type.

2. Write a flow chart to calculate surface area and volume of rectangular box with sides a, b, and c,
   Where surface area =2(ab+bc+ca)
   Write a program to calculate area and circumference of a circle, where area $A = \pi r^2$ and circumference $C = 2\pi r$

3. How the steps input process and output are graphically shown in a flow chart?
   Differentiate between an algorithm and flow chart? Write an algorithm to calculate and print c such that c= (a+b) (a-b).
   Write C++ program to print a number, its square and cube such that the numbers are from 1 to 500. How you can print only odd numbers in the above series?