Object Oriented Programming LAB – BSEF19

(Morning and Afternoon)

Lab 01 – 23-09-2020

Task 01 (4 each)

You have to create a data type named **complex** for complex numbers. The data type must have the following constraints and functionalities.

1. Store real numbers (with fraction e.g., 3.2092, 0.003, and 3.0) as component data types
2. Display (output) a complex number. E.g., 3-2.7i, (3, -2.7), 8.2i, -7
3. Get (input) a complex number as natural as you can
    a. get input from user and return and
    b. get input from user to reference parameter
4. return the negative of a complex number passed as parameter
5. return the conjugate of a complex number passed as parameter
6. return the magnitude of a complex number passed as parameter
7. return equality test result of two complex numbers passed as parameters
8. return the sum of two complex numbers passed as parameters
9. return the product of two complex numbers passed as parameters
10. return the multiplicative inverse of a complex number passed as parameter

Task 02 (10 each)

1. You have to create a main demo-logic to test the working of the above functionalities.
2. Consider *2* as w, *-4-2i* as x, *5-i* as y and *-i* as z are four complex numbers, demonstrate how the expression $\left((\boldsymbol{w}+\boldsymbol{z})*\overline{\boldsymbol{x}}\right)-\boldsymbol{y}$ can be evaluated using a single expression/statement. What is the result of the expression?

***Note**: You may need to create several code files/main functions with lots of shared (copy-pasted) code from other files.*