Date of Examination: 06*/10/2021*

AHSANULLAH UNIVERSITY OF SCIENCE AND TECHNOLOGY

Department: Computer Science and Engineering

Program: Bachelor of Science in Computer Science and Engineering

Final Examination: Fall 2020

Year: 1st Semester: 2nd

Course Number: CSE1206

Course Name: Object Oriented Programming Lab

Time: 50 minutes Full Marks: 20

[*Marks allotted are indicated in the right margin.*]

- All variables must be declared private.
- You can give any meaningful name to your Project.
- You should handle any exceptions in the main method only.
- Take user input in the main method.

On February 18, 2021 Perseverance Rover of NASA landed on Mars. The control center received some signal from the rover within 3 hours. But the signal was encoded with different numbers. Only the numbers which are **prime** carry the valid information otherwise discarded. *For example 5 is a prime number. So the information carried by 5 is valid. On the other hand 9 is not a prime number. So the information carried by 9 is discarded.* Now you are asked to develop a program that will be used to help the control center to receive and decode the signal waves.	
Inside the project create a package named: **myexceptions**. Inside this package create a user-defined checked/compile-time exception named **InvalidInformationException** and override both the empty constructor and also the constructor which takes a String as a parameter.	2
Now you have to develop a **inspectSignal()** method which will check if the received signal number follows the condition stated in the scenario or not. If not then it will give **InvalidInformationException** with the message **"Invalid Signal Received! Please Discard it."** Otherwise, it will print **"Signal Received with Information!"** **All classes and interfaces below should be created in the project-generated package.**	

Create an **interface** called **Signal** which has the **void** method **inspectSignal()**	1
Create an **abstract class** called **ControlCenter** which implements **Signal**. This ControlCenter class has a **private integer variable** named **code**. Write the getter setter methods for this variable. No need to write the constructor. **No need to override or implement the method from Signal here.**	2
Create a class named **Transceiver** which inherits **ControlCenter**. Here you will have to override the **inspectSignal()** method and do the checking for the number. Use the **getcode()** method from ControlCenter class as the value for the checking. **Do not handle the exception in this method.**	5
Create a class named **Translator**. This class contains a method **decodeSignal()** which will take your user input as a parameter. This method decodes the received signal and prints the following statements under the given conditions. ● When the signal number is 2 it prints: **"Minerals Found!"** ● When the signal number is 3 it prints: **"Microorganism Found!"** ● When the signal number is a prime number other than 2 or 3 it prints: **"Water Found!"**	5
Take user input. Now in the main class inside the main method create an object of Transceiver, assign a number to the “code” variable using the setter method, and then call the inspectSignal() method. If the signal fulfills the condition of being a meaningful signal and has encoded information then only you should call the **decodeSignal()** from the Translator class to find out what information the signal prints.	5