III SEMESTER B. TECH
MID TERM EXAMINATION, OCTOBER 2020
SUBJECT: PROGRAMMING IN JAVA (CSE2154)
REVISED CREDIT SYSTEM

Time: 90 Minutes **MAX. MARKS: 20**

Note:
(i) Answer ALL the questions.
(ii) Upload the Answers in the same order of QP

1.	Write a Java program to print the following pattern of stars.
	
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	` ********`
	`  ******`
	`   ****`
	`    **`
		02

2.	Suppose class A has four instance variables with four different access levels as follows:
	`class A{`
	`  private int x;`
	`  public int y;`
	`  protected int z;`
	`  int w;`
	`}`
	`public class B {`
	`  public static void main(String[] args) {`
	`  A a = new A();`
	`  System.out.println(a.x);`
	`  System.out.println(a.y);`
	`  System.out.println(a.z);`
	`  System.out.println(a.w);`
	
	`  }`
	`}`
		02

	Which of the four calls to println() in class B's main method are legal if: A. Class A and B are in the same package? B. Class A and B are in the different package? C. Class B is a subclass of A and in the same package? D. Class B is a subclass of A and in a different package?	
3.	What is difference between ***this*** and ***super*** keywords? Demonstrate with an example. Why can't static method access 'this' or 'super' in Java? Justify.	03
4.	Define a class to represent a complex number called Complex with 2 double type data members a and b. Provide the member functions to assign initial values to the Complex object & to display a complex number in the form a+ib. Write a function named 'absoluteOfComplex' to find the absolute value of a complex number. (Hint: absolute value of a complex number z=a+ib is defined as |z| = sqrt(a*a+b*b)). Throw a user defined exception ZeroAbsoluteValueException from the function absoluteOfComplex if the absolute value computed is zero. Add this class to a package MyComplexNumber. Illustrate the exception handling in main() method by creating an object of Complex class and computing the absolute value of a complex number. main() should be written in a separate package.	03
5.	Write a JAVA program to define a static method checkPT() to receive 3 positive integer parameters and checks whether they form Pythagorean triplet. If yes, display appropriate message, otherwise, throw custom exception called InvalidPythagoreanTripletException. The checkPT() method does not handle the exception thrown. Write main method in the same class to read 3 integers and make call to checkPT() method infinitely. The main method handles the exception by displaying the InvalidPythagoreanTripletException exception object. Use throw, throws, try and catch keywords appropriately in the program. Also illustrate re-throwing an exception in the program.	04
6.	Create a Counter class with a private count instance variable and two methods. The first method: synchronized void increment() tries to increment count by 1. If count is already at its maximum of 3, then it waits until count is less than 3 before incrementing it. The other method: synchronized void decrement() attempts to decrement count by 1. If count is already at its minimum of 0, then it waits until count is greater than 0 before decrementing it. Every time either method has to wait, it displays a statement that saying why it is waiting. Also every time increment or decrement occurs, the counter displays a	04

	statement that says what occurred and shows count's new value. increment() and decrement() will be executed by 2 separate threads. Use sleep(500) between each count print.	
7.	(i) Explain the order of execution of constructors in case of multilevel inheritance. (ii) Write a java statement to initialize **an irregular 2D String array**. How do you know the number of rows and columns in the 2D array ?	02