



## CSE 1322 Lecture Test 40 (Final Exam) Cover Sheet

Spring 2020

*In taking this test you affirm that you have neither given nor received inappropriate help and that the answers you submit are wholly your own.*

**Print your Name, ID# and Netid on each page.**

- 1) THERE ARE TEN (10) MAIN QUESTIONS AND AN EXTRA CREDIT QUESTIONS ON THIS TEST. HOWEVER, FOR SIMPLICITY, SOME QUESTIONS ARE SPLIT INTO MULTIPLE SEPARATE QUESTIONS. PLEASE MAKE SURE YOU ANSWER ALL QUESTIONS.**
- 2) You have **120** minutes to complete the exam
- 3) For all coding questions, please type in your codes directly without using any IDE.** Your code must be exact source code (include all required symbols, syntax, and indentation). It should be written to where a compiler would allow that code to run without any changes from the reader.
- 4) No code directly copied from a(n) IDE or website will be accepted. You can write PRINTLN() instead of System.out.println() in Java or Console.WriteLine() in C#.**
- 5) You cannot use any book, notes, electronic devices, calculator, smart watch, ear buds, etc.**
- 6) You are not allowed any electronic devices that can be used to look up or store answers.
- 7) All answers are to be your own, without the assistance of others.
- 8) Partial credit will be given where appropriate.

Name: \_\_\_\_\_

KSU ID# \_\_\_\_\_

NetId : \_\_\_\_\_

Date and time: \_\_\_\_\_

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- 1) [10 points] Describe FIVE distinct features (benefits and/or limitations) of parallel programming. Your answer should be language independent.**

Answer is language independent:

- 2) [10 points] Describe FIVE distinct features of multi-threaded programming. Your answer should be language independent.**

Answer is language independent:

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- 3) [10 pts] What is the output from the following code segment? Be careful about the incremental and decremental operators.**

```
public static void Main(){
    int x = 71;
    int y = 17;
    int z = DoIt(x, ref y);
    PRINTLINE(++x) + " " + (y++) + " " + (--z); // PRINTLINE 1
}

static int DoIt(int a, ref int b)
{
    a += 18;
    b -= 17;
    PRINTLINE((a++) + " " + (++b)); // PRINTLINE 2
    return (a + b);
}
```

Output from PRINTLINE (in Main())1:

Output from PRINTLINE 2 (in DoIt()):

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- 4) [10 pts] Given the Car and CarMain classes below, there are 12 statements (A thru L) that are either correct/ incorrect in the main() method. Identify any five statements (e.g., A, B, C, ... ) that will not be compiled. Assume that String == string (Java and C#). Please write just the statement numbers (e.g., A, B, C, E, F) of the statements that will not compile.

Choices

```
class Car {
    private String vin;
    public static String make;
    public String model;
    private int mileage;
    public String getVin() { return vin; }
    public void setVin(String carID) { this.vin = carID;}
    public int getMileage() { return mileage;}
    public void setMileage(int m) {this.mileage = m;}
    public static void carDetail() {/*... */}
}
public class CarMain {
    public static void main(String[] args) {

        Car c1 = new Car();

        /* A) */ Car.model = "CRV";
        /* B) */ c1.setVin("2020S91010");
        /* C) */ c1.setModel();
        /* D) */ Car.carDetail();
        /* E) */ c1.make = "Mustang";
        /* F) */ Car.make = "Mustang";
        /* G) */ Car.setVin();
        /* H) */ c1.getVin();
        /* I) */ c1.getMileage();
        /* J) */ c1.vin = "20348PS";
        /* K) */ Car.vin = "20348PS";
        /* L) */ carDetail();
    }
}
```

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- 5) [10 points] Using your choice of C# or Java (**NOT Pseudocode**), define a **class** for (i) a Dog with at least three attributes: age (public), gender (private), and weight (public). Your Dog class should have (ii) getter and setter method(s) for its private attribute; (iii) a default constructor that does nothing; (iv) an overloaded constructor that takes all of the arguments and copies them to the attributes; (v) Override the toString()/ToString() method to print the object's attributes on screen. **You don't need to declare the main() method but make sure that you fulfill all of the above requirements.**

C#:

Java:

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- 6) [10 points] Using your choice of C# or Java (**NOT Pseudocode**), (i) write an abstract class **Animal** that contains at least these two attributes: name, and isDomestic; and (ii) an abstract method animalDetail() that will assign values to the corresponding object's attributes. (iii) Then write a concrete class **Cat** that contains its own attribute: favoriteFood and inherits from the Animal class; and (iv) implements the animalDetail() method that just displays the object's own and inherited attributes; and (v) a main() method that creates an object of the Cat class, assigns values to its attributes, and displays them to the console. **Please use appropriate data types for the class attributes.**

C#:

Java:

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- 7) [10 points] Using the previous Dog class and the abstract Animal class with its subclass Cat. A main() method that contains the following expressions is shown below. Here Object is the built-in class defined in the language Java. In C# it is Object or object. With the information given here, which of the following statements (A thru J) that will **compile (Correct)?**

Please write just the statement numbers serially. (e.g., A, B, C, E, F)

Choices

```
public class MainClass {
    public static void main(String[] args) {

        /* A) */    Animal    a1 = new Animal();
        /* B) */    Animal    a2 = new Cat();
        /* C) */    Animal    a1 = new Dog ();
        /* D) */    Cat       c1 = new Animal();
        /* E) */    Cat       c2 = new Cat();
        /* F) */    Cat       c3 = new Dog();
        /* G) */    Dog       d1 = new Animal();
        /* H) */    Dog       d2 = new Cat();
        /* I) */    Dog       d3 = new Dog();
        /* J) */    Object    o1 = new Animal();
        /* K) */    Object    o2 = new Cat();
        /* L) */    Object    o2 = new Dog();

        } // End of main()

    } // End of the MainClass
```

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**8)** [10 pts] Suppose there is a text file named myfile.txt with some data in the root directory (e.g. C:\ or \) of your computer. Using your choice of language, C# or Java (**NOT Pseudocode**), write code that (i) opens the file in read mode; (ii) displays the file content on the monitor screen/console; (iii) uses exception handling mechanism with try, catch and finally blocks; and (iv) safely closes the file. Writing the main() method is optional.

C#: <input type="checkbox"/>	Java: <input type="checkbox"/>
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- 9) [10 pts] Suppose there is a 6-element queue Q (from front to back: 101, 103, 105, 102, 104, 106), and an empty stack S. If you remove the elements one-by-one from the queue Q and insert them into the stack S, then remove them one-by-one from the stack S and re-insert them into the queue Q. Then, what will the queue look like after all those operations occur (from front to back)? **Write your answer in the box below.**

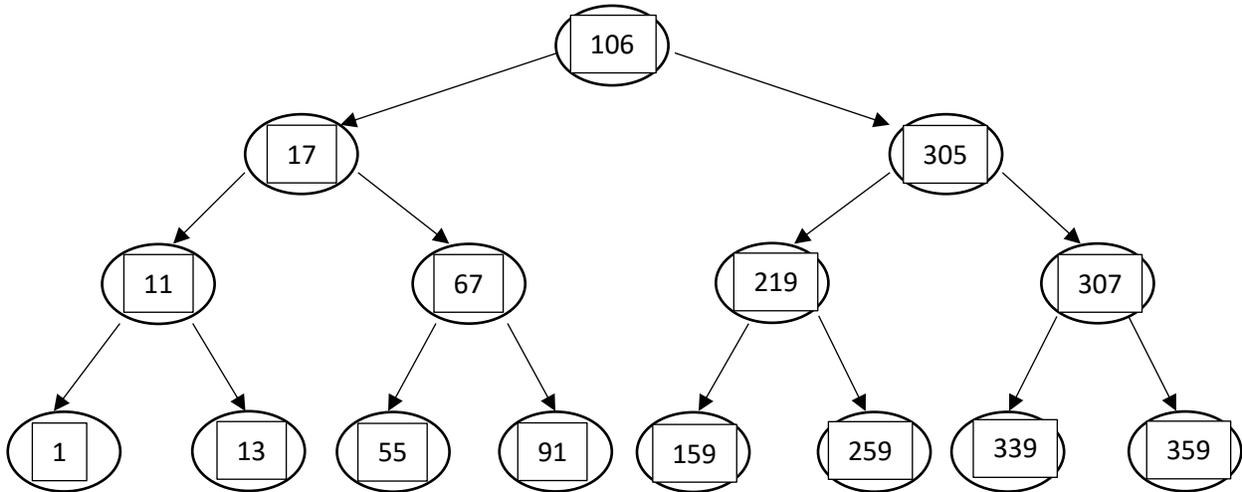
**Please separate the numbers with commas (e.g., 101, 103, 105, ...)**

Queue Status:

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10) [10 pts] For the following Binary Tree, write the PreOrder and PostOrder Traversal output. Make sure to separate the numbers with commas (e.g., 1, 3, 5, )



Output from PreOrder Traversal:

Output from PostOrder Traversal:

11) [ 2 point] Extra Credit Question:

[Please make sure that you wrote your name EXACTLY as your Gradescope account name. You didn't write your short or nick name. Otherwise, you will lose this Extra Credit Point even your answer is correct.]

What is the resultant value of  $(12\%5 == 2\%5)$ ?