Name: _____

Write all of your responses on these exam pages. If you need extra space please use the backs of the pages.

1 Short Answer (5 Points Each)

1. Write a single line of code that declares an integer variable `n` and assigns to it a random integer between -10 and 10, inclusively.

2. Write a single line of code that declares a string variable called `str1` and stores in it your name.

3. What does ASCII stand for and what is it?

4. Which of the following are valid variable names. If the variable name is invalid state why.

   (a) `hciaHUihlHU`

   (b) `Item17`

   (c) `if`

   (d) `Oh&My`

   (e) `53cookies`

5. What is the difference between a compiler and an interpreter? Also, discuss Java's method.

6. Java is a "platform-independent language." What is a *platform*, what does *platform-independent* mean, and how does Java attain its platform independence?

2 Program Traces (20 Points Each)

1. For each of the given inputs, write the output of the program.

```
1  import java.util.Scanner;
2
3  public class Exam01Trace01 {
4
5      public static void main(String[] args) {
6          Scanner keyboard = new Scanner(System.in);
7
8          System.out.print("Number 1: ");
9          int a = keyboard.nextInt();
10         System.out.print("Number 2: ");
11         int b = keyboard.nextInt();
12         System.out.print("Number 3: ");
13         int c = keyboard.nextInt();
14
15         int x = a;
16         int y = b;
17         int z = c;
18
19         int w = a / b;
20         int t = a % b;
21         System.out.println(x + " " + y + " " + z);
22         System.out.println(w + " " + t);
23
24         z = x;
25         x = y;
26         y = z;
27         w = x++;
28         t = --y;
29
30         System.out.println(x + " " + y + " " + z);
31         System.out.println(w + " " + t);
32
33         x = a;
34         y = b;
35         z = c;
36         z += x;
37         y *= 3;
38
39         System.out.println(x + " " + y + " " + z);
40         System.out.println(w + " " + t);
41
42         x = a;
43         y = b;
44         z = c;
45
46         w = 2 * x + 3 * (z + y);
47         double d = Math.pow(x, 2) + Math.pow(y, 2);
48
49         System.out.println(x + " " + y + " " + z);
50         System.out.println(w + " " + d);
51
52         d = a / 4.0;
53         System.out.print(d + " ");
54         System.out.print(Math.round(d) + " ");
55         System.out.println((int) d);
56     }
57 }
```

(a)
```
Number 1: 7
Number 2: 5
Number 3: 3
```

(b)
```
Number 1: 13
Number 2: 4
Number 3: 7
```

2. For the given input, write the output of the program. For any spaces, including leading or trailing, use an under bracket to represent the space. For example, `Hi  There ` should be written as `Hi␣␣There␣`.

```
1  import java.util.Scanner;
2
3  public class Exam01Trace02 {
4
5      public static void main(String[] args) {
6          Scanner keyboard = new Scanner(System.in);
7
8          System.out.print("String 1: ");
9          String a = keyboard.nextLine();
10         System.out.print("String 2: ");
11         String b = keyboard.nextLine();
12         System.out.print("String 3: ");
13         String c = keyboard.nextLine();
14
15         int n = a.indexOf(b);
16         int m = a.indexOf(c);
17         int p = b.indexOf(c);
18         int q = a.lastIndexOf(b);
19
20         System.out.println(a.length());
21
22         System.out.print(n + " " + m + " ");
23         System.out.println(p + " " + q);
24         String x = a.substring(n, m);
25         System.out.println(x);
26
27         x = a.substring(n);
28         System.out.println(x);
29
30         x = a.substring(n, q);
31         System.out.println(x);
32
33         System.out.println(a.endsWith("icky"));
34
35         x = a + " " + c;
36         System.out.println(x);
37         System.out.println(a.toUpperCase());
38         System.out.println(a);
39
40         System.out.println(a.charAt(5));
41     }
42 }
```

```
String␣1:␣This␣is␣tricky
String␣2:␣is
String␣3:␣rick
```

3 Coding (20 Points Each)

1. In the game of Fizzbin one player rolls two fair 6 sided die. If the first roll results in the same number on both die the player loses. If the two die have different numbers on them then the player gets a second roll. If on the second role the sum of the values of the die are odd then the player wins but if the sum of the values of the die are even the player loses. Write a program that will play the game of Fizzbin. Three example runs are below.

```
First Roll: 2 3
Second Roll: 3 4
You win!
```

```
First Roll: 5 2
Second Roll: 5 3
You lose!
```

```
First Roll: 3 3
You lose!
```

```
import java.util.Scanner;

public class Exam01_1 {

    public static void main(String[] args) {
        Scanner keyboard = new Scanner(System.in);









    }
}
```

2. Write a program that will ask the user to input their name on a single line in informal style (e.g. John Doe), and their year of birth (in yyyy format, such as 1985). The program should print out the users formal name (e.g. Doe, John). It should then determine where in the alphabet their last name belongs, either the first half or the second half. If their last name begins with A–M then their name is in the first half and if it begins with N–Z it is in the second half. The program should calculate their age and then print it out. Then if the user's age is less than or equal to 12 print out "You are just a kid.", if the user's age is greater than 12 but less than 20 then print out "You are a teenager.", if the user's age is greater than or equal to 20 but less than 40 then print out "You are getting up there.", and finally if the user's age is greater than or equal to 40 print out "Man, you are old!". Two sample runs are below,

```
Input your name in informal form: Don Spickler
What year were you born: 1965
Your formal name is: Spickler, Don
Your name is in the second half of the alphabet.
Your age: 53
Man, you are old.
```

```
Input your name in informal form: John Doe
What year were you born: 1999
Your formal name is: Doe, John
Your name is in the first half of the alphabet.
Your age: 19
You are a teenager.
```

```
import java.util.Scanner;

public class Exam01_2 {

    public static void main(String[] args) {
        Scanner keyboard = new Scanner(System.in);
```

```
        }
    }
```