Name: ID:

Use the following declarations and initializations in Questions 1, 2, and 3:

```
final static String KSU = "KSU";
String    str = "PNU",    msg = "I love mama!";
char      a = 'Z',        letter = 'd';
int       num = 1,        x = 456789;
double    dnum = 2.75;
float     fnum;
```

Question #1: Strings and formatting (4.5 pts)

What is the output of each of the following?

	System.out. ...	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5
1.	.printf("{%7.3f}",dnum);	{	~	~	2	.	7	5	0	}						
2.	.printf("%-4s**%0.1f",KSU,dnum);	K	S	U	~	*	*	2	.	8						
3.	.printf("%3d%%%c",x,a)	4	5	6	7	8	9	%	Z							
4.	String s = msg.replace('m' , 'b'); .print(s + "_And_" + msg.substring(msg.indexOf('m')+1));	I	~	l	o	v	e	~	b	a	b	a	!	~	A	n	d	~	m	a	~	!

Question #2: True or False (T/F)? Note: consider each point independently. (6pts)

1. (F) Java is a structured programming language.
2. (T) A reference variable contains the address of the value it points to
3. (F) A variable of type `short` uses less space in memory than a variable of type `byte`.
4. (F) To assing to `fnum` the value 3.5 we write: ((`fnum = 3.5float;`))
5. (F) Writing ((`letter = a;`)) will copy the address of 'Z' into the memory location where `letter` is stored
6. (F) The output of these ((`x =(int)dnum+0.5; System.out.print(x);`)) is: 3
7. (F) ((`System.out.print(--letter);`)) will cause an error.
8. (F) using `num%2` is commonly used to test if num is even or odd or zero.

Assume you have a `scanner` to read input called `in`.

The following cause no syntax errors and no run-time errors:

9. (F) ((`num = in.nextInt();`)) if the input is: 22.0
10. (T) ((`fnum = in.nextFloat();`)) if the input is: 0.22
11. (T) ((`a = in.next().charAt(0);`)) if the input is: 2.20
12. (F) ((`KSU = in.nextLine();`)) if the input is: King Saud University

Question #3: MCQ: choose only one correct answer: (2pts)

1. ((`if(letter='d') letter='b';`)) will do the following:
   a. change the content of `letter` from 'd' to 'b'
   b. leave `letter` unchanged
   c. cause a run-time error
   d. cause a syntax error

2. After executing ((`dnum+= num++/2;`)) the value of dnum will be:
   a. 2.75
   b. 3.0
   c. 3.25
   d. 3.75

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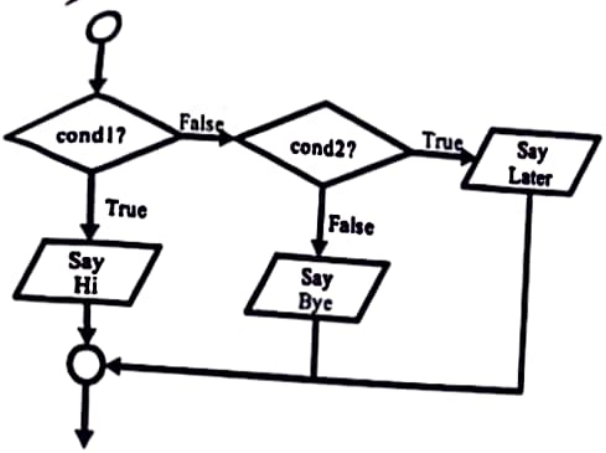
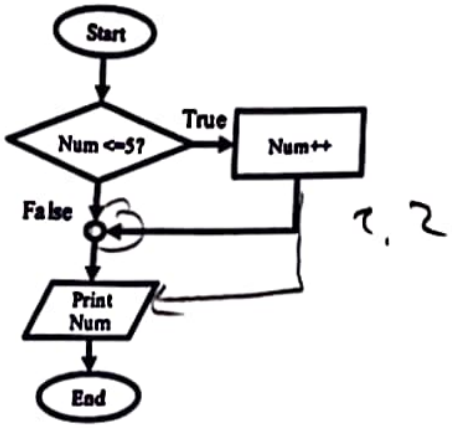


1. The flowchart is equivalent to which algorithm?
   a. if (cond1) Print Later
      else if (cond2) Print Hi
      else Print Bye
   b. if (cond1) Print Hi
      else if (cond2) Print Later
      else Print Bye
   c. if (cond1)
      if (cond2) Print Later
      else Print Bye
      else Print Hi
   d. if (cond1 AND cond2) Print Later
      else Print Hi and Print Bye



2. Which of the following is true?
   a. Num cannot become greater than 5
   b. The condition has an `else` part
   c. The flowchart has an error
   d. It is wrong to use  for printing

Question #4: Error detection (2pts)

State the line number of the 4 errors in the code. Also state the reason OR correct the error.

Code	line# and Correction/Reason
1) import java.util.*;	4 Errors:
2) public class ClassWithErrors {	3) new
3) public static Scanner in = Scanner(System.in);	
4) public static void main (String[] args) {	5) double d;
5) double d, float f;	
6) String strDistance;	7) add */
7) f = in.nextFloat(); /* reading a float	
8) d += f;	11) (int)
9) System.out.println("Enter distance to home in km: ");	
10) strDistance = in.next(); // assume user enters: 12.75	
11) int i = Integer.parseInt(strDistance);	
12) }} // end main and class	

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5.5/6

Question #5: Coding & Tracing (5.5pts)

1. Assume `read` is a `Scanner`. What is the output of the code for each of the 2 sample inputs:

```
1)  int num = read.nextInt();
2)  String selection = read.next();
3)
4)  switch (selection)
5)  { case "many": num += 10;
6)    case "few":  num += 5;
7)                 break;
8)    case "none": System.out.print("Oh no! ");
9)                 if (num>0)
10)                  System.out.println("I lost my " + num + " pens.");
11)                 num = 0;
12) } //end switch
13) System.out.println("I have " + num + " pens.");
```

num = num + 10 = 3 + 10 = 13
num = num + 5 = 13 + 5 = 18 num = 12

user input sample 1 → 3 many
I have 18 pens.

1.5

user input sample 2 → 5 none
Oh no! I lost my 5 pens. I have 0 pens.

2.5

2. Rewrite the code of part (1) by replacing the `switch` statement with equivalent `if` statement(s):

```
int num = read.nextInt();
String selection = read.next();
if(selection.equals("many") || selection.equals("few"))
{num += 10;
 num += 5;}
else if (selection.equals("few")
   num+=5;
else if (selection.equals("none")
{System.out.print("Oh no! ");
 if(num>0)
{System.out.println("I lost my "+num+" pens.");
  num=0;}
}
System.out.println("I have "+num+" pens.");
```

-.25 -.25

3. If we want the code in part (1) to accept the selection regardless of the case it is written by the user (e.g. "Many" or "fEw" or "NONE"...), what statement(s) do we need to add on line (3)?

1

```
selection = selection.toLowerCase();
```