1 What does the following code fragment print? (1)

```
String string1 = "Hello";
String string2 = string1;
string1 = "World!";
System.out.println(string1);
System.out.println(string2);
```

2 Write a brief explanation for the results in Question #1. (1)

3 Given a string `site` that represents the URL for a website, write a code fragment to determine its top-level domain (TLD). For example, the TLD for the string `"http://www.woodstockschool.in"` is: `in`. (2)

4 A string, `s`, is a *circular shift* of a string, `t`, if it matches when the characters are circularly shifted by any number of positions. For example, `ACTGACG` is a circular shift of `TGACGAC` and vice versa. Detecting this condition is important in the study of genomic sequences. Write a method that checks whether two given strings, `s` and `t`, are circular shifts of one another. (2)

Note: This can be accomplished using a very simple technique involving string concatenation.

5 *Password Strength Verification.* Write a static method that takes a single, `String` argument and returns `true` if it meets all of the following conditions and `false` otherwise. (4)

- The string is at least 8 characters in length.
- The string contains at least one numeric digit (0–9).
- The string contains at least one upper-case letter.
- The string contains at least one lower-case letter.

6 *Kama Sutra Cipher.* The *Kama Sutra* describes a fairly simple encryption technique (listed as the "art of secret writing"). It requires a one-to-one pairing of letters. A message can then be encoding by replacing every letter with its pair. (6)

Example: Suppose that the following table of pairings were being used:

T	H	E	Q	U	I	C	K	B	R	O	W	N
F	X	J	M	P	S	V	L	A	Z	Y	D	G

Then, the message "MEET AFTER SCHOOL" would be encoded as: "QJJF BTFJZ IVYYK".

Often, the pairings will be recorded as a series of keywords which are then used to create the table of pairings. (In the above example, the two keywords are: "THEQUICKBROWN" and "FXJMPSVLAZYDG".)

Create a method, `KamaSutra()`, that will take three, `String` parameters: the first parameter is the text to be encoded and the remaining two parameters are the two keywords for a Kama Sutra cipher and returns the encrypted text.

Note: Treat as a precondition that the keywords are of equal length and contain no duplicate letters.