

COMPUTER SCIENCE ITC315118

EXEMPLAR

Students no longer study Java applets. This has been replaced by Java applications.

The example questions on the following pages have been prepared to outline this change.

Section B

Question 6

This question relates to the following code. The numbers on the left are not part of the program and are provided for reference purposes.

```
1. class Encoder {
2.     char secret[] = { 'C', 'O', 'V', 'E', 'R', 'T' };
3.     int length = secret.length;
4.     int[] encoding = new int[length];
5.     char[] encrypted = new char[length];

6.     public void run() {
7.         process(secret, encoding);
8.         finalise(encoding, encrypted);
9.     }

10.    public int count(char[] secret) {
11.        String check;
12.        String vowel = "AEIOU";
13.        int tally = 0;
14.        for (int i = 0; i < length; i++) {
15.            check = secret[i] + "";
16.            if (vowel.indexOf(check, 0) != -1) {
17.                tally = tally + 1;
18.            }
19.        }
20.        return tally;
21.    }

22.    public void process(char[] secret, int[] encoding) {
23.        for (int i = 0; i < length; i++) {
24.            encoding[i] = (int) secret[i];
25.        }
26.        int count = count(secret);
27.        int finish = (length - 1) / count * count;
28.        int temp = encoding[0];
29.        int j = count;
30.        while (j <= finish) {
31.            encoding[j - count] = encoding[j];
32.            j = j + count;
33.        }
34.        encoding[finish] = temp;
35.        for (int i = 0; i < length; i++) {
36.            encoding[i] = encoding[i] + count;
37.        }
38.    }

39.    public void finalise(int[] intArray, char[] encrypted) {
40.        for (int i = 0; i < length; i++) {
41.            encrypted[i] = (char) intArray[i];
42.        }
43.    }

44.    public static void main(String[] args) {
45.        Encoder enc = new Encoder();
46.        enc.run();
47.        String output = new String(enc.encrypted);
48.        System.out.println("Encrypted code is: " + output);
49.    }
50. }
```

(a) (i) Trace the code giving the values in the arrays as indicated below:

- The contents of the array **secret** after completing line 2.

secret					
0	1	2	3	4	5

- The contents of the array **encoding** after completing the *for loop* on lines 23–25.

encoding					
0	1	2	3	4	5

- The contents of the array **encoding** after completing line 34.

encoding					
0	1	2	3	4	5

- The contents of the array **encoding** after completing the *for loop* on lines 35–37.

encoding					
0	1	2	3	4	5

- The contents of the array **encrypted** after completing the *for loop* on lines 40-42.

encrypted					
0	1	2	3	4	5

(ii) What will be displayed on the console after the code is executed?

.....



(b) If the parameters were removed from all methods, which method would produce an error?

What would the error be?

.....
.....
.....
.....
.....

(c) Consider the following version of the **finalise** method.

```
public void finalise(int[] intArray, char[] encrypted) {  
    encoding[0] = 99;  
}
```

If this method was executed using the call on line 8, it would make the value of **intArray**[0] equal to 99.

Explain why this is the case by referring to the way in which an array is passed as a parameter to a method.

.....
.....
.....
.....
.....
.....
.....
.....
.....
.....