Object-oriented Programming and Software Engineering CITS1001

Multiple-choice Mid-semester Test

Semester 1, 2018

- **Mark your solutions on the provided answer page, by filling in the appropriate circles.**

- **Write your name and student number on the answer sheet, and also fill in the circles for both.**

- **The papers will be marked by an automatic scanner, so make sure that your selections are clear.**

- **There are fifteen questions: ignore options 16–125 on the answer sheet.**

- **Use the blank pages at the end for rough work.**

- **Feel free to separate the answer sheet from the question sheets, but hand in both at the end of the test.**

- **The time allowed is forty minutes.**

1. What value does `mystery(12)` return?

```
public int mystery(int x)
{
    int n = 0;
    for (int k = x; k > 0; k = k / 2)
        if (k % 2 != 0) n++;
    return n;
}
```

a) 0
b) 1
c) 2
d) 3
e) 4

2. Given `int` variables `x > 0` and `y > 0`, which of these statements is true?

a) `x % y` is 0 only when `x == y`
b) `x % y` is always less than `x / y`
c) `x % y` is always less than `y`
d) `x % y` is always equal to `y % x`
e) `x % y` is always greater than `0`

3. What is the value of the expression `false == false == false == false`?

a) It contains a syntax error
b) It contains a type error
c) It contains a run-time error
d) `false`
e) `true`

4. A `String` is represented in a Java program as

a) an object.
b) a primitive value.
c) an array.
d) an `ArrayList`.
e) a binary number.

5. Which of these statements uses the correct syntax to copy the first element of the array `xs` into its last element?

a) `xs[0] = xs[xs.length - 1];`
b) `xs[xs.length - 1] = xs[0];`
c) `xs.add(xs.get(0));`
d) `xs[xs.length] = xs[0];`
e) `xs[0] = xs[xs.size() - 1];`

6. What are the values of `m` and `n` after these statements?

```
int m = 10;
int n = 1;
n = n * m;
m = n / m;
n = n / m;
```

a)   1,   1
b)   1,   10
c)   10,   1
d)   10,   10
e) 100, 100

7. What value does `mystery(29)` return?

```java
public int mystery(int n)
{
    int[] xs = new int[n+1];
    xs[1] = 33;
    for (int k = 2; k <= n; k++)
        xs[k] = xs[k-1] - xs[k-2];
    return xs[n];
}
```

a) -66
b) -33
c)   0
d) 33
e) 66

8. A method that has return type `void` and that assigns values to an object's instance variables is known as

a) an accessor method.
b) a class method.
c) a constructor method.
d) a general method.
e) a mutator method.

9. If a class has multiple constructors, they must all have

a) different argument types.
b) different names.
c) different return types.
d) different statements.
e) different visibility.

10. What value does `mystery(4, -2)` return?

```java
public int mystery(int a, int b)
{
    while (a > b)
    {
        a = a + b;
        b = a * b;
    }
    return b;
}
```

a) -4
b) -2
c) 2
d) 8
e) 16

11. What sort of variable should be used to store data
that is important throughout an object's lifespan?

a) A constructor variable
b) A heap variable
c) A field variable
d) A method variable
e) A parameter variable

12. Which of these evaluates to the same result as the expression `88 - 66 / 5 - 3`?

a) `88 - ((66 / 5) - 3)`
b) `(88 - (66 / 5)) - 3`
c) `(88 - 66) / (5 - 3)`
d) `((88 - 66) / 5) - 3`
e) `88 - (66 / (5 - 3))`

13. If `k` is a big number, what does `mystery(k)` return?

```java
public int mystery(int k)
{
    int z = k % 10;
    while (k >= 10)
    {
        z = k % 10;
        k = k / 10;
    }
    return z;
}
```

a) `k`'s least significant digit
b) `k`'s second least significant digit
c) `k`'s middle digit
d) `k`'s second most significant digit
e) `k`'s most significant digit

14. Given this statement, how many `Strings` can `names` store?

```java
String[][] names = new String[5][6];
```

a) 5
b) 6
c) 11
d) 30
e) 56

15. How many times does this for-loop execute?

```java
for (int k = 53; k > 6; k = k / 2)
```

a) 1
b) 2
c) 3
d) 4
e) 5