

AP COMPUTER SCIENCE - TEST #2

SECTION I

Number of Questions — 15

Percent of total test grade — 64

Directions: Determine the answer to each of the following questions or incomplete statements, using the available space for any necessary scratch work. Then decide which is the best of the choices given and fill in the corresponding oval on the answer sheet. No credit will be given for anything written in the examination booklet (these pages). Do not spend too much time on any one problem.

Notes:

- Assume that classes listed in the Quick Reference found in Appendix have been imported where appropriate.
- Assume that declarations of variables and methods appear within the context of an enclosing class.
- Assume that method calls that are not prefixed with an object or class name and are not shown within a complete class definition appear within the context of an enclosing class.

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1. Consider the following method.

```
public static void conditionalTest(int a, int b)
{
    if ((a > 0) && (b > 0))
    {
        if (a > b)
            System.out.println("A");
        else
            System.out.println("B");
    }
    else if ((b < 0) || (a < 0))
        System.out.println("C");
    else
        System.out.println("D");
}
```

What is printed as a result of the call `conditionalTest(3, -2)` ?

- (A) A
- (B) B
- (C) C
- (D) D
- (E) Nothing is printed.

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2. Consider the following static method.

```
public static int calculate(int x)
{
    x = x + x;
    x = x + x;
    x = x + x;

    return x;
}
```

Which of the following can be used to replace the body of `calculate` so that the modified version of `calculate` will return the same result as the original version for all possible values of `x` ?

- (A) `return 3 + x;`
- (B) `return 3 * x;`
- (C) `return 4 * x;`
- (D) `return 6 * x;`
- (E) `return 8 * x;`

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3. Assume that `a` and `b` are boolean variables and have been properly initialized.

`(a && b) || !(a && b)`

The result of evaluating the expression above is best described as:

- (A) Always true
 - (B) Always false
 - (C) true only when `a` is true and `b` is true
 - (D) true only when `a` and `b` have the same value
 - (E) true only when `a` and `b` have different values
4. Consider the following code segment.

```
for (int outer = 0; outer < n; outer++)
{
    for (int inner = 0; inner <= outer; inner++)
    {
        System.out.print(outer + " ");
    }
}
```

If `n` has been declared as an integer with the value 4, what is printed as a result of executing the code segment?

- (A) 0 1 2 3
- (B) 0 0 1 0 1 2
- (C) 0 1 2 2 3 3 3
- (D) 0 1 1 2 2 2 3 3 3 3
- (E) 0 0 1 0 1 2 0 1 2 3

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5. Consider the following code segment.

```
for (int i = 1; i <= 4; i++)
{
    for (int j = 1; j <= 3; j++)
    {
        System.out.print("#");
    }
    System.out.println();
}
```

Which of the following is true about this code segment?

- (A) It displays a rectangle made out of # symbols with height=4 and width=3.
- (B) It displays a rectangle made out of # symbols with height=3 and width=4.
- (C) It displays a triangle made out of # symbols with height=3 and base=4.
- (D) It displays a line segment of # symbols with length=12.
- (E) Nothing is displayed.

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6. Consider the following incorrect program:

```
public class ComplicatedExample {  
  
    public static final int MAX = 3;  
  
    public static void twice() {  
        int x = 0;  
        for (int i = 0; i < MAX*4; i += 2) {  
            x++;  
        }  
        System.out.println("twice is " + x);  
    }  
  
    public static void main(String[] args) {  
        int y = 3;  
        for (int number = 0; number < y; number++) {  
            twice();  
        }  
        System.out.println("number is " + number);  
    }  
}
```

Which variable is incorrectly accessed outside of its scope?

- (A) x
- (B) y
- (C) number
- (D) MAX
- (E) args

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Questions 7-9 refer to the following Java program:

```
public class Parameters {  
  
    public static void cheers(int num) {  
        for (int i = 1; i <= num; i += 2) {  
            System.out.println("Hooray!");  
        }  
    }  
  
    public static void main(String[] args) {  
        cheers(7);  
    }  
}
```

7. Which of the following is the **formal parameter** used by the `cheers` method?
- (A) `int num`
 - (B) `public static void main`
 - (C) `public static void cheers`
 - (D) `"Hooray!"`
 - (E) `7`
8. Which of the following is the **actual parameter** used in the method call to `cheers`?
- (A) `int num`
 - (B) `public static void main`
 - (C) `public static void cheers`
 - (D) `"Hooray!"`
 - (E) `7`

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9. How many lines of output are produced when this program is executed?

- (A) 0
- (B) 1
- (C) 3
- (D) 4
- (E) 7

10. Consider the following Java program:

```
public class Exponents {  
  
    public static final int BASE = 2;  
  
    public static void main(String [] args) {  
        for (int i = 1; i <= 25; i++) {  
            int power = (int)Math.pow(BASE, i);  
            System.out.println(  
                BASE + " to the " + i + " power is " + power);  
        }  
    }  
}
```

What is the 4th line of output produced when this program is executed?

- (A) 2 to the 4 power is 16
- (B) BASE to the i power is power
- (C) 4 to the 2 power is 16.0
- (D) 2 to the 4 power is (int)Math.pow(BASE, i)
- (E) public class FishInAStream

11. Suppose `s` has been declared as a `String` variable. What is the correct syntax for calling the `length` method on `s`?

- (A) `s.length`
- (B) `String.length()`
- (C) `length.s`
- (D) `String.length`
- (E) `s.length()`

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Questions 12-13 refer to the following Java program. (NOTE: 1 centimeter = 0.39 inches, and there are 12 inches in a foot)

```
public class Height {
    public static void main(String[] args) {
        double centimeters = 190.0;
        double feet = 0.0;
        convert(centimeters, feet);
        System.out.println("Height in feet is: " + feet);
    }

    // converts centimeters to feet
    public static void convert(double c, double f) {
        f = (c * 0.39) / 12;
    }
}
```

12. What **error** does this Java program contain? (What **mistake** did the programmer make?)

- (A) The `main` method should be the last method listed in the Java file.
- (B) The method `convert` assigns the result of its computation to a formal parameter, when a `return` statement should be used instead.
- (C) The conversion from centimeters to feet should use a nested `for` loop.
- (D) The comment appearing before the `convert` method is not a valid Java comment.
- (E) Java does not allow combined declaration and assignment like this:
`double centimeters = 190.0;`

13. What is output to the console when this program is executed?

- (A) `Height in feet is: 0.0`
- (B) `Height in feet is: 6.175`
- (C) `Height in feet is: 190.0`
- (D) `Height in feet is: feet`
- (E) `Hello, world.`

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14. Consider the following incomplete method.

```
public int myMethod(int n)
{
    // myMethod body
}
```

The following table shows several examples of input values and the results that should be produced by calling `myMethod`.

Input Value n	Value Returned by myMethod(n)
2	20
3	30
4	40
6	60
10	100

Which of the following code segments could be used to replace `// myMethod body` so that the method will produce the results shown in the table?

I `int x = n * 10;`
 `return x;`

II `n = n * 10;`

III `double y = n * 10.0 + 0.5;`
 `int z = (int)y;`
 `return z;`

- (A) I only
- (B) II only
- (C) III only
- (D) I and II
- (E) I and III

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15. Consider the following complete program:

```
public class MyStars {

    public static final int J_MAX = 2;

    public static int careful(int x) {
        int y = 1 + x / 2;
        return y;
    }

    public static void loopStars(int n) {
        int iMax = careful(n);
        for (int i = 1; i <= iMax; i++) {
            for (int j = 1; j <= J_MAX; j++) {
                System.out.println("*");
            }
        }
    }

    public static void main(String[] args) {
        loopStars(3);
    }
}
```

How many stars * are printed to the console when this program is executed?

- (A) None
- (B) 2
- (C) 3
- (D) 4
- (E) 8

END OF SECTION I.