Question 1

Answer A

Correct. The correct answer is I only. Statement I is correct because the value of `result` at the end of the code segment is `2 * n + 1`, which is the intended value. Statements II and III are incorrect because the value of `result` at the end of each code segment is `(n + 1) * 2`, which is different than the intended value `2 * n + 1`.

Question 2

Answer D

Correct. The integer division `b / c` is performed first, producing `2`; then `2` is multiplied by `2`, producing `4`; finally, `4` is added to `a`, producing `9`.

Question 3

Answer B

Correct. The third line of code increments `c` by `3`, which is equal to `a + 3`. The fourth line of code decrements `d`, which is equal to `b - 1`. The fifth line of code assigns the current value of `c`, `a + 3`, to the variable `num`. The sixth line of code divides `num` by the current value of `d`, `b - 1`, which is equal to `(a + 3) / (b - 1)`.

Question 4

Answer C

Correct. It is most appropriate for `c`, `d`, and `pi` to be represented as `double` variables because they are intended to store decimal values. It is most appropriate to declare `pi` as `final`, as it is a constant.

Question 5

Answer C

Correct. The variable `a` is initialized to `5` and then multiplied by `3`, resulting in `15`. The variable `b` is initialized to `4` and then incremented by the value of `a`, resulting in `19`. The variable `b` is then divided by `c` using integer division. Since `c` was initialized to `2`, the result of the integer division is `9`.

Question 6

Answer C

Correct. Since the variables `x` and `y` are declared as `int` data types, the result of the addition operation performed on those variables will be of type `int`. If `z` is declared as an `int`, as in statements I and II, the code will compile because `z` is assigned an `int` value. The variable `z` does not need to be assigned an initial value because it is reassigned a new value on the next line. However, the declaration in statement III of `z` as a `boolean` data type will not compile, because there is no way to cast a value from an `int` to a `boolean`.

Question 7

Answer C

Correct. The criterion "exceeds `0.5`" indicates that the average score will be a fractional value; thus, the `avgScore` variable should be declared as a `double`. Since the `count` variable is intended to store a count of players, which is a nonnegative integer, it should be declared as an `int`.

Question 8

Answer B

Correct. Since the original value of `x` has been stored in `temp`, the variable `x` can be assigned the value of `y` and then `y` can be assigned the original value of `x`, as stored in `temp`.

Question 9

Answer D

Correct. The statement `num += num;` adds the value of `num` to `num` and stores the result back in `num`, so that `num` is now two times its original value. The statement `num *= num;` then multiplies the value of `num` by `num` and stores the result back in `num`, so that `num` is now the square of twice its original value.

Question 10

Answer A

Correct. The expression `num % 10` extracts the rightmost digit of `num` by evaluating to the remainder when `num` is divided by `10`. The expression `num / 10` extracts the leftmost digit by evaluating to the result of the integer division of `num` by `10`.

Question 11

Answer D

Correct. In expression I, the operation `10 % 12`, which evaluates to `10`, is performed first. The resulting expression `9 + 10` evaluates to `19`. In expression II, the operation `9 + 10`, which evaluates to `19`, is performed first. The resulting expression `19 % 12` evaluates to `7`. In expression III, the operation `2 % 12`, which evaluates to `2`, is performed first. The resulting expression `9 - 2` evaluates to `7`.

Question 12

Answer E

Correct. The variable `x` is initialized to `5` and then incremented by `12`, resulting in `17`. It is then decremented by the result of the integer division of `3` by `2`, which is `1`, resulting in `16`.

Question 13

Answer D

Correct. The variable `k` is unchanged because it is incremented twice and decremented twice, each time by `1`. The variable `count` is increased by `2` because it is incremented twice, each time by `1`.

Question 14

Answer D

Correct. The variables `a` and `b` are initialized to `4` and `5`, respectively, then incremented by `1`, resulting in `5` and `6`. The variable `c` is assigned the sum of `a` and `b`, or `11`. The variable `a` is then decremented by `1`, resulting in `4`. Finally, the sum of `a` and `c`, or `15`, is printed.

Question 15

Answer E

Correct. The expression `8 % 5` evaluates to the remainder left when `8` is divided by `5`, or `3`.