

APCSA MCT 40Q Practice No. 1 - May 2019**Multiple Choice**

Identify the choice that best completes the statement or answers the question.

- _____ 1. Which operator is used to assign a new value to a variable?
- a. =
 - b. ==
 - c. *
 - d. -
 - e. +
- _____ 2. Which is not a primitive data type?
- a. int
 - b. double
 - c. char
 - d. boolean
 - e. String
- _____ 3. In the statement `import java.util.*;` the * indicates
- a. that all members of the util package are to be accessible.
 - b. that all members of the util package that start with * are to be accessible.
 - c. that no members of the util package are to be accessible.
 - d. that all members of the java.lang package are to be accessible.
 - e. that no members of the java.lang package are to be accessible.
- _____ 4. Which statement should be used to decide among three or more actions?
- a. if statement
 - b. if-else statement
 - c. nested if-else statement
 - d. if-else-if statement
 - e. else-if statement
- _____ 5. Given the following code segment:

```
if( x > 0 )
{
    if( y > 0 )
    {
        System.out.println( "x and y" );
    }
    else if( z > 0 )
    {
        System.out.println( "x and z" );
    }
}
```

Which is displayed when `x = 56`, `y = -234`, and `z = -45`?

- a. x and y
 - b. x and z
 - c. 56 and -45
 - d. No output will be displayed.
 - e. 56 and -234
- _____ 6. In the code segment above, which variable is the accumulator?
- a. quantityReceived
 - b. numShipments
 - c. inStock
 - d. SENTINEL

7. Given the following code segment:

```
for( int i = 0; i < 10; i++ )
{
    for( int j = 0; j < 3; j++ )
    {
        System.out.print( "#" );
    }
}
```

How many number signs will be displayed when the code segment is run?

- a. 3
- b. 4
- c. 30
- d. 300
- e. 10

8. Given the following code segments:

```
I.  int a = 0;
    int b = 10;
    while( b > 0 )
    {
        a++;
        b--;
    }
    System.out.print( a );
```

```
II. b = 10;
    for( int a = 0; b > 0; b-- )
    {
        a++;
    }
    System.out.print( a );
```

Which statement is true?

- a. The output of I and II will be the same.
- b. The output of I will be 10 and the output of II will be 12345678910.
- c. II will generate a syntax error.
- d. II will generate an infinite loop.
- e. The output of I will be 0 and the output of II will be 10.

9. Which debugging tool is the table below an example of?

num1	output	num2
0	0	2
		4
4	4	6
		8
8	8	10

- a. breakpoints
- b. additional println() statements
- c. debugger
- d. assertions
- e. variable trace

_____ 10. Given the following code segment:

```
String lastName = "Watson";  
int nameLength;  
nameLength = lastName.length();
```

What is the value of `nameLength` after the statements execute?

- a. 5
- b. 6
- c. 8
- d. Watson
- e. String

_____ 11. Given the following code segment:

```
System.out.println( newName );  
String greeting = "HELLO";  
String greeting2 = "Hello";  
int value;  
value = greeting.compareToIgnoreCase( greeting2 );
```

Which is stored in `value` after the statements execute?

- a. the value 0
- b. a positive number
- c. a negative number
- d. false
- e. true

_____ 12. Which keyword is an access modifier?

- a. static
- b. void
- c. public
- d. call
- e. final

_____ 13. Which part of the method declaration determines if the method can be called by other methods?

- a. semicolon
- b. access level
- c. parameters
- d. postcondition
- e. name

_____ 14. Given the following code segment:

```
public static int prob2( int x, int y )  
{  
    int j;  
    j = y + 2;  
    j += x * 2;  
    return(j);  
}
```

```
public static void main( String[] args )  
{  
    int j = 6;  
    int k = 4;  
    j = prob2( j, k );  
    System.out.println( j );  
}
```

Which will be displayed after the code executes?

- a. 12
- b. 18
- c. 24
- d. 36
- e. A syntax error will be generated.

- _____ 15. How many values can a `return` statement return?
- a. 0
 - b. 1
 - c. 2
 - d. 3
 - e. An unlimited number.
- _____ 16. Which is included in a class body?
- I. methods
 - II. variables
 - III. constructors
- a. I only
 - b. I and III only
 - c. II and III only
 - d. I, II, and III
 - e. II only
- _____ 17. Variables and methods are called
- a. members of a class.
 - b. instances of a class.
 - c. class declarations.
 - d. client code.
 - e. class designs.
- _____ 18. When a subclass redefines a superclass method, the subclass method
- a. overrides the superclass method.
 - b. inherits the superclass method.
 - c. encapsulates the superclass method.
 - d. casts the superclass method.
 - e. overloads the superclass method.
- _____ 19. Which allows a class to define a specialized type of an already existing class?
- a. polymorphism
 - b. inheritance
 - c. encapsulation
 - d. reusability
 - e. recursion
- _____ 20. Which is a class with method declarations that have no implementations?
- a. abstract class
 - b. superclass
 - c. test class
 - d. interface
 - e. subclass
- _____ 21. Which is an example of an index?
- a. `true`
 - b. `"Elaine"`
 - c. `names.get(1)`
 - d. `names`
 - e. `2`

_____ 22. Given the following code segment:

```
public class Test
{
    public static void main( String[] args )
    {
        int[] i = new int[ 10 ];
        System.out.println( "The value of i[ 2 ] is: " + i[ 2 ] );
    }
}
```

Which will be displayed after the code executes?

- a. The value of i[2] is 0.
 - b. The value of i[2] is 2.
 - c. The value of i[2] is 10.
 - d. The value of i[2] is 20.
 - e. A run-time error is generated because i[2] is not assigned a value.
- _____ 23. Each element in a String array is automatically initialized to
- a. true.
 - b. false.
 - c. null.
 - d. ""
 - e. Elements in a string array are not initialized.
- _____ 24. Which is stored when a letter is assigned a char variable?
- a. the binary representation of the letter
 - b. the Unicode representation of the letter
 - c. the actual letter
 - d. an index value between 1 and 26
 - e. the integer representation of the letter
- _____ 25. Which statement converts the String password to a character array?
- a. String.password(toCharArray());
 - b. passChars = password.toCharArray();
 - c. passChars = CharArray();
 - d. passChars = password.toCharArray();
 - e. password.convertToCharArray();
- _____ 26. Which statement is false?
- a. An array must store elements that are all of the same data type.
 - b. An array can be one-dimensional or two-dimensional.
 - c. The same array name is used for all the elements in an array.
 - d. The elements in an array are initialized to 1 if they are of type int.
 - e. An array can store both primitive and abstract data types.
- _____ 27. Which statement determines the number of elements in the columns of a two-dimensional array?
- a. cols = gameBoard[0].size;
 - b. cols = gameBoard.length;
 - c. cols = gameBoard[0].length;
 - d. cols = gameBoard.noCols;
 - e. cols = gameBoard.size;

_____ 28. Which statement assigns the letter "O" to the first row position in the third column position of a two-dimensional array named chrGame?

- | | |
|-------------------------|-------------------------|
| a. chrGame[2][0] = "O"; | d. chrGame[3][1] = "O"; |
| b. chrGame[0][2] = "O"; | e. chrGame[1, 3] = "O"; |
| c. chrGame[1][3] = "O"; | |

_____ 29.

```
for( arrayIndex = 0 to numItems-1 )
{
    for( subarrayIndex = arrayIndex to numItems-1 )
    {
        if( items[ subarrayIndex ] < items[ arrayIndex ] )
        {
            swap items[ subarrayIndex ] and items[ arrayIndex ]
        }
    }
}
```

Which algorithm is defined in the pseudocode above?

- | | |
|-------------------|------------------|
| a. selection sort | d. binary search |
| b. insertion sort | e. linear search |
| c. mergesort | |

_____ 30. Which sorting algorithm sequentially removes an item from a list and adds it back to the list in the appropriate position relative to the previous items in the list?

- | | |
|-------------------|-------------------|
| a. merge sort | d. quick sort |
| b. selection sort | e. insertion sort |
| c. bubble sort | |

_____ 31. An array A of 100 items is to be sorted by mergesort. Suppose that the two halves of the array have been sorted through recursive calls, and the merge() method is then called with the statement:

`merge(A, 1, 50, 100);`

How many comparisons between elements will be performed during this call?

- | | |
|--------|--------|
| a. 10 | d. 150 |
| b. 50 | e. 500 |
| c. 100 | |

_____ 32. Which algorithms use a divide and conquer approach?

- I. Selection Sort
- II. Insertion Sort
- III. Mergesort
- IV. Binary Search

- | | |
|-------------------|-------------------|
| a. I and II | d. I, III, and IV |
| b. III and IV | e. I and IV |
| c. I, II, and III | |

_____ 33. How many elements would be checked in a search for 5 in an array that stores 2, 4, 17, 89, 100 using the binary search?

- | | |
|------|------|
| a. 1 | d. 4 |
| b. 2 | e. 5 |
| c. 3 | |

Assume the binary search algorithm will be used to find elements in the ordered array with the sequence of elements below:

22, 23, 33, 42, 55, 85, 88

- _____ 34. How many elements would be examined to find the number 88, including the 88 itself?
- a. 1
 - b. 2
 - c. 3
 - d. 4
 - e. 5
- _____ 35. What is the most number of elements that would have to be examined by the binary search on an array of 1000 elements sorted low to high?
- a. 1
 - b. 10
 - c. 100
 - d. 500
 - e. 1000
- _____ 36. Which method returns the number of data items in a stack or a queue?
- a. isEmpty()
 - b. enqueue()
 - c. front()
 - d. length()
 - e. size()
- _____ 37. Which method adds a new node to the front of a list?
- a. push()
 - b. addAtFront()
 - c. front()
 - d. enqueue()
 - e. pop()
- _____ 38. The process when a method calls itself is referred to as
- a. polymorphism.
 - b. inheritance.
 - c. recursion.
 - d. sorting.
 - e. searching.
- _____ 39. Which algorithms have an average case running time of $O(n^2)$?
- I. selection sort
 - II. insertion sort
 - III. mergesort
 - IV. binary search
- a. I and II only
 - b. I, II, and III only
 - c. III and IV only
 - d. II, III, and IV only
 - e. III only
- _____ 40. Which algorithm's standard design involves a recursive method call?
- a. selection sort
 - b. insertion sort
 - c. merge sort
 - d. bubble sort
 - e. linear search

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Answer Section

MULTIPLE CHOICE

1. ANS: A	PTS: 1	TOP: Using Variables
2. ANS: E	PTS: 1	TOP: Primitive Data Types
3. ANS: A	PTS: 1	TOP: Java Packages
4. ANS: D	PTS: 1	TOP: The if-else if Statement
5. ANS: D	PTS: 1	TOP: The if-else if Statement
6. ANS: C	PTS: 1	TOP: Counters and Accumulators
7. ANS: C	PTS: 1	TOP: The for Statement
8. ANS: C	PTS: 1	TOP: The for Statement
9. ANS: E	PTS: 1	TOP: Debugging Techniques
10. ANS: B	PTS: 1	TOP: The String Class
11. ANS: A	PTS: 1	TOP: Comparing Strings
12. ANS: C	PTS: 1	TOP: Writing Methods
13. ANS: B	PTS: 1	TOP: Writing Methods
14. ANS: B	PTS: 1	TOP: Method Parameters The return Statement
15. ANS: B	PTS: 1	TOP: The return Statement
16. ANS: D	PTS: 1	TOP: Designing and Writing a Class
17. ANS: A	PTS: 1	TOP: Designing and Writing a Class
18. ANS: A	PTS: 1	TOP: The Object Class
19. ANS: B	PTS: 1	TOP: Extending a Class
20. ANS: D	PTS: 1	TOP: Interfaces
21. ANS: E	PTS: 1	TOP: Declaring Arrays
22. ANS: A	PTS: 1	TOP: Declaring Arrays
23. ANS: C	PTS: 1	TOP: Declaring Arrays
24. ANS: B	PTS: 1	TOP: Characters and Arrays
25. ANS: D	PTS: 1	TOP: Characters and Arrays
26. ANS: D	PTS: 1	TOP: Two-Dimensional Arrays
27. ANS: C	PTS: 1	TOP: Two-Dimensional Arrays
28. ANS: B	PTS: 1	TOP: Two-Dimensional Arrays
29. ANS: A	PTS: 1	TOP: Selection Sort
30. ANS: E	PTS: 1	TOP: Insertion Sort
31. ANS: C	PTS: 1	TOP: Mergesort
32. ANS: B	PTS: 1	TOP: Mergesort Binary Search
33. ANS: C	PTS: 1	TOP: Binary Search
34. ANS: C	PTS: 1	TOP: Binary Search
35. ANS: B	PTS: 1	TOP: Binary Search
36. ANS: E	PTS: 1	TOP: The Stack Data Structure The Queue Data Structure
37. ANS: B	PTS: 1	TOP: The Linked List Data Structure
38. ANS: C	PTS: 1	TOP: Recursion
39. ANS: A	PTS: 1	TOP: Mergesort Binary Search
40. ANS: C	PTS: 1	TOP: Mergesort