

CS-3020
Advanced Object Technology Using C#/.NET
Spring 2015

EXAM #1
(Chapters 1 - 8)

Name: _____

SCORES

MC: _____/70 PROB #1: _____/15 PROB #2: _____/15

TOTAL: _____/100

Multiple Choice Responses

Each multiple choice question in the separate packet is worth 2 points. There is no partial credit in this section. Choose the **BEST** answer of those given. Please indicate your answer by **DARKENING** the response that you have chosen **in the space provided below**. Make your selection obvious. Don't forget to mark your answers on this sheet. Only answers indicated below will be graded.

- | | | | | |
|--------------|---------------|---------------|---------------|---------------|
| 1. a b c d e | 8. a b c d e | 15. a b c d e | 22. a b c d e | 29. a b c d e |
| 2. a b c d e | 9. a b c d e | 16. a b c d e | 23. a b c d e | 30. a b c d e |
| 3. a b c d e | 10. a b c d e | 17. a b c d e | 24. a b c d e | 31. a b c d e |
| 4. a b c d e | 11. a b c d e | 18. a b c d e | 25. a b c d e | 32. a b c d e |
| 5. a b c d e | 12. a b c d e | 19. a b c d e | 26. a b c d e | 33. a b c d e |
| 6. a b c d e | 13. a b c d e | 20. a b c d e | 27. a b c d e | 34. a b c d e |
| 7. a b c d e | 14. a b c d e | 21. a b c d e | 28. a b c d e | 35. a b c d e |

Problem #1 (15 pts)

What will the output of the following C# app be?

```
using System;

public class InitArray
{
    public static void Main( string[] args )
    {
        int[ , ] bob = { { 1, 2, 3 }, { 4, 5, 6 } };
        int[][] sue = { new int[] { 1, 2 },
                       new int[] { 3 },
                       new int[] { 4, 5, 6 } };

        OutputArray( sue );
        Console.WriteLine();
        OutputArray( bob );
    }

    public static void OutputArray( int[ , ] array )
    {
        Console.WriteLine("Array Type #1");
        for ( int row = 0; row < array.GetLength( 0 ); ++row )
        {
            for ( int column = 0; column < array.GetLength( 1 ); ++column )
                Console.Write( "{0} ", array[ row, column ] );
            Console.WriteLine();
        }
    }

    public static void OutputArray( int[][] array )
    {
        Console.WriteLine("Array Type #2");
        foreach ( int[] row in array )
        {
            foreach ( int element in row )
                Console.Write( "{0} ", element );
            Console.WriteLine();
        }
    }
}
```

Problem #2 (15 pts)

The following C# app generates ten random prices, in five cent increments, that can be as low as \$18.55 and as high as \$26.30. What values should be used for the constants A, B, and C (including any necessary type modifiers, such as M)?

```
using System;

class RandomPrice
{
    const decimal MIN = 18.55M;
    const decimal MAX = 26.30M;
    const decimal INC = 0.05M;

    const decimal A = 0;
    const decimal B = 0;
    const int     C = 0;

    public static void Main(string[] args)
    {
        Random random = new Random();
        decimal start, stop;
        decimal value;
        for (int i = 0; i < 10; i++)
            Console.WriteLine("{0:C}", NextValue(random.Next(C)));
    }

    private static decimal NextValue(int randomInt)
    {
        return A + B*randomInt;
    }
}
```

const decimal A = _____;

const decimal B = _____;

const int C = _____;

Write initializers for A, B, and C in terms of the constants MIN, MAX, and INC -- you may also use A, B, and C if you like. You cannot use ANY literal values). Apply any necessary typecasts.

const decimal A = _____;

const decimal B = _____;

const int C = _____;

CS-3020 Multiple Choice Questions

Carefully record your response on the cover sheet of the exam.

- #1 A _____ is called to initialize a new instance of a class.
- (a) new
 - (b) constructor
 - (c) destructor
 - (d) creator
- #2 A common logic error known as a(n) _____ occurs when the programmer incorrectly specifies a conditional operator, such as < instead of <=.
- (a) fatal error
 - (b) syntax error
 - (c) off-by-one error
 - (d) None of these.
- #3 A(n) _____ conversion occurs when a type is converted to a type that can hold more data.
- (a) widening
 - (b) explicit
 - (c) implicit
 - (d) None of these.
- #4 Almost any _____ can be reasonably represented as an object.
- (a) behavior
 - (b) verb
 - (c) noun
 - (d) adjective
- #5 A case can be labeled as _____ to execute in the event that none of the provided cases are equivalent to the controlling expression.
- (a) general
 - (b) default
 - (c) case *
 - (d) None of these.
- #6 A static method can _____.
- (a) manipulate only static fields in the same class directly
 - (b) be called using the class name and a dot (.)
 - (c) call only other static methods of the same class directly
 - (d) All of these

- #7 If a local variable in a method has the same name as a field of the method's class, what will occur?
- (a) an error is generated
 - (b) the field is "hidden" until the method is finished executing
 - (c) the field will override the variable from the method
 - (d) None of these.
- #8 Objects normally are not allowed to know how other objects are implemented. This is called _____.
- (a) incarceration
 - (b) inheritance
 - (c) blindfolding
 - (d) information hiding
- #9 Passing a reference type by value is done to protect:
- (a) the original object from being modified.
 - (b) the reference itself from being modified.
 - (c) data outside the bounds of an array.
 - (d) All of these.
- #10 Suppose that class Book has been defined. Which set of statements creates an array of Book objects?
- (a) `Book[] books; books = new Book()[numberElements];`
 - (b) `new Book() books[]; books = new Book[numberElements];`
 - (c) `Book[] books; books = new Book[numberElements];`
 - (d) All of these.
- #11 Suppose variable gender is MALE and age equals 60, how is the expression(`gender == FEMALE`) && (`age >= 65`) evaluated?
- (a) Both conditions are evaluated, from right to left
 - (b) The condition (`age >= 65`) is evaluated first and the evaluation stops immediately.
 - (c) Both conditions are evaluated, from left to right.
 - (d) The condition (`gender == FEMALE`) is evaluated first and the evaluation stops immediately.
- #12 The _____ statement, when executed in a while loop, skips the remaining statements in the body of the statement and begins the next iteration of the loop.
- (a) continue
 - (b) next
 - (c) break
 - (d) None of these.

- #13 The _____ statement, when executed in a for loop, will terminate the loop.
- (a) next
 - (b) break
 - (c) continue
 - (d) None of these.
- #14 The header for `(int i = 0; i <= 10; ++i)` will cause `i` to be incremented:
- (a) after the body begins to execute, but before it finishes.
 - (b) after the entire body executes.
 - (c) before the body begins execution.
 - (d) None of these.
- #15 The local variables used in each invocation of a method during an app's execution are stored in the _____.
- (a) stack frame
 - (b) program execution stack
 - (c) activation record
 - (d) All of these.
- #16 The loop body of a `do...while` statement always executes _____.
- (a) more than once
 - (b) zero times
 - (c) undeterminable
 - (d) at least once
- #17 The parameter in the Main header allows for _____.
- (a) command-line arguments
 - (b) the use of strings
 - (c) input and output capacity
 - (d) All of these
- #18 The `foreach` repetition statement requires that you provide an array and a variable for the purpose of:
- (a) storing the value of each element that is traversed.
 - (b) preventing the structure from going past the end of the array.
 - (c) acting as a counter to traverse the array.
 - (d) None of these.

- #19 To call a static method, use the _____ name followed by a period, and the method with its arguments.
- (a) namespace's
 - (b) instance variable's
 - (c) class's
 - (d) All of these
- #20 To type a decimal literal, you must type the letter _____ at the end of a real number.
- (a) M or m
 - (b) D or d
 - (c) E or e
 - (d) C or c
- #21 What is the difference between a float and a double?
- (a) double variables store numbers with larger magnitude and finer detail.
 - (b) double variables store integers and float variables store floating-point numbers.
 - (c) double variables store numbers with smaller magnitude and coarser detail.
 - (d) None of these.
- #22 What is the keyword associated with variable-length argument lists?
- (a) vla
 - (b) var
 - (c) arg
 - (d) params
- #23 What is the proper foreach header format?
- (a) (foreach type identifier in arrayName)
 - (b) foreach (type identifier in arrayName)
 - (c) foreach (arrayName)
 - (d) None of these.
- #24 What occurs when an empty case matches the controlling expression?
- (a) fall through
 - (b) None of these
 - (c) infinite loop
 - (d) syntax error
- #25 When an object is concatenated with a string:
- (a) the object's class name is used.
 - (b) a compilation error occurs.
 - (c) a runtime error occurs.
 - (d) the object's ToString method is implicitly called.

- #26 When may an app omit the `string[] args` parameter from the Main header?
- (a) when the app does not take command-line arguments
 - (b) when the app does not output any strings
 - (c) when the app does not need to use strings
 - (d) All of these
- #27 Which case of the following would warrant using the boolean logical inclusive OR (`|`) rather than the conditional OR (`||`)?
- (a) Testing if at least one of two conditions is true when the left operand has a required side effect.
 - (b) Testing if at least one of two conditions is true.
 - (c) Testing if at least one of two conditions is true when the right operand has a required side effect.
 - (d) Testing if two conditions are both true.
- #28 Which of the following is a reason for using the get and set accessors?
- (a) To make a program more robust.
 - (b) To follow a universal standard.
 - (c) To allow the class to control the manner in which the data is set or returned and To make a program more robust
 - (d) To allow the class to control the manner in which the data is set or returned.
- #29 Which of the following statements about the break statement is false?
- (a) Common uses of the break statement are to escape early from a loop or to skip the remainder of a switch.
 - (b) A break statement can only break out of an immediately enclosing while, for, do...while or switch statement.
 - (c) The break statement is used to exit a repetition statement early and continue execution after the loop.
 - (d) The break statement, when executed in a while, for or do...while, skips the remaining statements in the loop body and proceeds with the next iteration of the loop.
- #30 Which of the following for headers is syntactically incorrect?
- (a) `for (; i == 3;)`
 - (b) `for (int i = 1; i < 10;)`
 - (c) `for (i == 3)`
 - (d) `for (i++; i < 10; i=0)`

- #31 Which of the following will violate the rules of overloading methods?
- (a) Methods with different number of arguments.
 - (b) Method with different types of arguments.
 - (c) Methods with different signatures but the same return type.
 - (d) Methods with the same signatures but different return types.
- #32 Which of the following data items are arranged from the smallest to the largest in the data hierarchy?
- (a) bits, files, fields, records, characters
 - (b) bits, characters, fields, records, files
 - (c) fields, characters, bits, files, records
 - (d) records, characters, fields, bits, files
- #33 Which statement is false?
- (a) Placing a semicolon after the right parenthesis enclosing the parameter list of a method declaration is a syntax error.
 - (b) If a method does not return a value, the return-value-type in the method declaration can be omitted.
 - (c) Forgetting to return a value from a method that should return a value is a compilation error.
 - (d) Re-declaring a method parameter as a local variable in the method's body is a compilation error.
- #34 _____ is (are) typically used to traverse a two-dimensional array.
- (a) A do while statement
 - (b) Three nested for statements
 - (c) Two nested for statements
 - (d) A for statement
- #35 _____ methods can be called without the need for an object of the class to exist.
- (a) Dependent
 - (b) Static
 - (c) Independent
 - (d) Special