

Choose the BEST answer of those given and enter your choice on the Answer Sheet. You may choose multiple options, but the point value will be divided by the number of options chosen.

#1 Class String and the Char structure are found in the:

- (a) Strings namespace
- (b) System.Strings namespace
- (c) System.Text namespace
- (d) System namespace
- (e) System.Chars namespace

#2 A string literal:

- (a) contains letters and punctuation only.
- (b) is a sequence of characters in double quotation marks.
- (c) contains exactly its variable name and nothing else.
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#3 To create a string literal that excludes escape sequences, use:

- (a) #`"string"`
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#4 The bounds on a string are always:

- (a) 0 to `string.Length`.
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#5 string indexers treat strings as:

- (a) arrays of characters
- (b) ASCII code
- (c) a character
- (d) a string array
- (e) binary code

- #6 If an IndexOfAny method is passed an array of characters it:
- (a) returns the number of occurrences that were found withing the string.
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- #7 Concatenating with strings is done with:
- (a) operator overloading.
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  - (c) reserved words.
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- #8 The proper way to convert a string to all lowercase is:
- (a) `STRING = string;`
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- #9 Which of the following is not an example of a struct:
- (a) a char
  - (b) an int
  - (c) a byte
  - (d) a double
  - (e) a string
- #10 What is the efficiency of linear search?
- (a)  $O(n)$ .
  - (b)  $O(\log n)$ .
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- #11 What is the term used for binary search's run time?
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- #14 Dynamic data structures grow and shrink at \_\_\_\_\_ time.
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  - (b) run
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  - (d) load
  - (e) compile
- #15 Every simple type struct inherits from class \_\_\_\_\_.
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  - (b) ValueType
  - (c) SimpleType
  - (d) Struct
  - (e) Number

- #16 A(n) \_\_\_\_\_ conversion is when an object is cast into another type.
- (a) wrapping
  - (b) converting
  - (c) boxing
  - (d) unboxing
  - (e) implicit
- #17 A \_\_\_\_\_ class contains a reference member that refers to an object of the same class type.
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  - (d) self-reflective
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- #18 Usually a \_\_\_\_\_ indicates to a program the end of a data structure.
- (a) null reference
  - (b) forward slash character
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  - (d) backslash character
  - (e) space character
- #19 An isEmpty method you write to test whether a linked list is empty is called a \_\_\_\_\_ method.
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  - (c) preemption
  - (d) preorder
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- #20 A stack is a \_\_\_\_\_ data structure.
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  - (c) FILO
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  - (b) Generic classes
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- (a) run-time type safety
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- #24 When a method is called, the compiler tries to find a method that matches the \_\_\_\_\_ of the method call.
- (a) name, argument types, and return type
  - (b) name and argument types
  - (c) argument types
  - (d) return type
  - (e) name
- #25 All generic method declarations have a type parameter section delimited by \_\_\_\_\_.
- (a) pipes ('|')
  - (b) square brackets ( '[' and ']' )
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- #26 The \_\_\_\_\_ clause specifies the type constraint for type parameter T.
- (a) when
  - (b) where
  - (c) constraint
  - (d) cnstr
  - (e) types
- #27 A(n) \_\_\_\_\_ provides a means for describing a class in a type-independent manner.
- (a) parameterized class
  - (b) generic class
  - (c) concrete class
  - (d) abstract class
  - (e) subclass
- #28 Prepackaged data-structure classes provided by the .NET Framework are called \_\_\_\_\_.
- (a) data structural classes
  - (b) data classes
  - (c) DS classes
  - (d) collection classes
  - (e) abstract data type classes
- #29 Which of the following is not a collection class in C#?
- (a) File
  - (b) SortedDictionary
  - (c) HashTable
  - (d) ArrayList
  - (e) BitArray
- #30 One should use the collections from the \_\_\_\_\_ namespace to help specify the exact type that will be stored in a collection.
- (a) System.Collections.Specialized
  - (b) System.Collections
  - (c) System.Collections.Typed
  - (d) System.GenericCollections
  - (e) System.Collections.Generics

- #31 Which of the following is not a method provided by an array?
- (a) Index
  - (b) BinarySearch
  - (c) Copy
  - (d) Sort
  - (e) Reverse
- #32 Classes which implement the IEnumerator interface must contain which of the following methods?
- (a) MoveNext, Reset, Reverse
  - (b) MoveNext, Current, Reverse
  - (c) MoveNext, Reset, Current
  - (d) Reset, Current, Reverse
  - (e) Enumerate, First, Current
- #33 How is an ArrayList different from a regular array?
- (a) Both are the same; however one is a naming convention of C#
  - (b) the size is dynamic
  - (c) it can hold objects of various types and has a dynamic size
  - (d) arrays can only hold primitive data types
  - (e) it can hold objects of various types
- #34 Peek throws a(n) \_\_\_\_\_ if the stack is empty.
- (a) EmptyException
  - (b) StackEmptyException
  - (c) InvalidMethodOrPropertyException
  - (d) InvalidOperationException
  - (e) PeekException
- #35 When two different keys "hash into" the same cell in an array, this is known as a(n) \_\_\_\_\_.
- (a) collision
  - (b) conjunction
  - (c) crash
  - (d) problem
  - (e) error

- #36 The \_\_\_\_\_ is the ratio of the number of objects stored in the hash table to the total number of cells of the hash table.
- (a) packing factor
  - (b) density
  - (c) proportion
  - (d) share
  - (e) load factor
- #37 The enumerator of a HashTable uses the \_\_\_\_\_ structure to store key-value pairs.
- (a) Connection
  - (b) Relationship
  - (c) KeyValue
  - (d) Bond
  - (e) DictionaryEntry
- #38 A(n) \_\_\_\_\_ performs a calculation that determines where to place data in the hash table.
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- #39 A \_\_\_\_\_ is the general term for a collection of key-value pairs.
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  - (b) book
  - (c) dictionary
  - (d) glossary
  - (e) lexicon
- #40 All arrays implicitly inherit from which generic interface?
- (a) IComparable
  - (b) IEnumerator
  - (c) IList
  - (d) IEnumerable
  - (e) Both IList and IEnumerable



- #41 To determine if the string object `myString` begins with the "Four" you might use
- (a) `myString.StartsWith("Four")`
  - (b) `String.StartsWith(myString, "Four")`
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  - (d) `myString[0:4] == "Four"`
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- (a) does not change the contents of the object `myString`.
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  - (c) returns the Boolean value `True` if `myString` consists only of uppercase characters.
  - (d) throws an exception if `myString` contains any characters that are not letters.
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- #43 To perform file processing, which namespace must be imported?
- (a) `System.FileIO`
  - (b) `System.Directory`
  - (c) `System.IO`
  - (d) `System.File`
  - (e) `System.System`
- #44 A dialog box that prevents you from interacting with any other window until you have closed it is termed a(n)
- (a) preemptive dialog.
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- #47 Which of the follow describes the defining rule for a minimum heap?
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- #49 A generic type without any specified type constraints
- (a) must work for any and all data types that ever have and ever will be defined.
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- #50 What type of objects can be used as keys in a hash table?
- (a) Only objects that implement the `Comparable` interface.
  - (b) Only objects that inherit from the class `Hashable`.
  - (c) Only objects that implement the `IHashable` interface.
  - (d) Any object.
  - (e) Only objects that inherit from the class `Hashtable`.

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  - (c) Only objects that inherit from the class Hashtable.
  - (d) Any object.
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- (d) System.Strings namespace
- (e) Strings namespace

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#3 To create a string literal that excludes escape sequences, use:

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#5 string indexers treat strings as:

- (a) a character
- (b) a string array
- (c) arrays of characters
- (d) binary code
- (e) ASCII code

- #6 If an IndexOfAny method is passed an array of characters it:
- (a) returns the number of occurrences that were found within the string.
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- #9 Which of the following is not an example of a struct:
- (a) a byte
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  - (e) a string
- #10 What is the efficiency of linear search?
- (a)  $O(n^2)$ .
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- #11 What is the term used for binary search's run time?
- (a) Quadratic run time.
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  - (e) creation
- #15 Every simple type struct inherits from class \_\_\_\_\_.
- (a) Number
  - (b) ValueType
  - (c) Struct
  - (d) Primitive
  - (e) SimpleType

- #16 A(n) \_\_\_\_\_ conversion is when an object is cast into another type.
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  - (c) FILO
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  - (e) LIFO



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  - (b) name
  - (c) argument types
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  - (e) name, argument types, and return type
- #25 All generic method declarations have a type parameter section delimited by \_\_\_\_\_.
- (a) curly brackets ( '{' and '}' )
  - (b) pipes ( '|' )
  - (c) square brackets ( '[' and ']' )
  - (d) parenthesis ( '(' and ')' )
  - (e) angle brackets ( '<' and '>' )

- #26 The \_\_\_\_\_ clause specifies the type constraint for type parameter T.
- (a) where
  - (b) constraint
  - (c) when
  - (d) cnstr
  - (e) types
- #27 A(n) \_\_\_\_\_ provides a means for describing a class in a type-independent manner.
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  - (e) subclass
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  - (b) DS classes
  - (c) data structural classes
  - (d) collection classes
  - (e) abstract data type classes
- #29 Which of the following is not a collection class in C#?
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  - (b) HashTable
  - (c) SortedDictionary
  - (d) ArrayList
  - (e) BitArray
- #30 One should use the collections from the \_\_\_\_\_ namespace to help specify the exact type that will be stored in a collection.
- (a) System.GenericCollections
  - (b) System.Collections.Generics
  - (c) System.Collections
  - (d) System.Collections.Typed
  - (e) System.Collections.Specialized

- #31 Which of the following is not a method provided by an array?
- (a) Index
  - (b) BinarySearch
  - (c) Copy
  - (d) Reverse
  - (e) Sort
- #32 Classes which implement the IEnumerator interface must contain which of the following methods?
- (a) MoveNext, Reset, Reverse
  - (b) Enumerate, First, Current
  - (c) MoveNext, Current, Reverse
  - (d) MoveNext, Reset, Current
  - (e) Reset, Current, Reverse
- #33 How is an ArrayList different from a regular array?
- (a) it can hold objects of various types and has a dynamic size
  - (b) the size is dynamic
  - (c) it can hold objects of various types
  - (d) arrays can only hold primitive data types
  - (e) Both are the same; however one is a naming convention of C#
- #34 Peek throws a(n) \_\_\_\_\_ if the stack is empty.
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  - (b) InvalidMethodOrPropertyException
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- #35 When two different keys "hash into" the same cell in an array, this is known as a(n) \_\_\_\_\_.
- (a) crash
  - (b) collision
  - (c) error
  - (d) conjunction
  - (e) problem

- #36 The \_\_\_\_\_ is the ratio of the number of objects stored in the hash table to the total number of cells of the hash table.
- (a) proportion
  - (b) share
  - (c) load factor
  - (d) density
  - (e) packing factor
- #37 The enumerator of a HashTable uses the \_\_\_\_\_ structure to store key-value pairs.
- (a) DictionaryEntry
  - (b) Connection
  - (c) Relationship
  - (d) Bond
  - (e) KeyValue
- #38 A(n) \_\_\_\_\_ performs a calculation that determines where to place data in the hash table.
- (a) calculator
  - (b) indexer
  - (c) definition
  - (d) hash function
  - (e) converter
- #39 A \_\_\_\_\_ is the general term for a collection of key-value pairs.
- (a) codebook
  - (b) lexicon
  - (c) dictionary
  - (d) glossary
  - (e) book
- #40 All arrays implicitly inherit from which generic interface?
- (a) IComparable
  - (b) IEnumerable
  - (c) Both IList and IEnumerable
  - (d) IEnumerator
  - (e) IList

- #41 To determine if the string object `myString` begins with the "Four" you might use
- (a) `myString.StartsWith("Four")`
  - (b) `String.StartsWith(myString, "Four")`
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  - (d) `myString[0:4] == "Four"`
  - (e) `myString.Starts("Four")`
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- (a) throws an exception if `myString` contains any characters that are not letters.
  - (b) returns the Boolean value `True` if `myString` consists only of uppercase characters.
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  - (d) does not change the contents of the object `myString`.
  - (e) is a syntax error.
- #43 To perform file processing, which namespace must be imported?
- (a) `System.System`
  - (b) `System.File`
  - (c) `System.IO`
  - (d) `System.FileIO`
  - (e) `System.Directory`
- #44 A dialog box that prevents you from interacting with any other window until you have closed it is termed a(n)
- (a) priority dialog.
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- #45 Quicksort's worst-case performance is
- (a)  $O(n^3)$
  - (b)  $O(\log(n))$
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  - (d)  $O(n)$
  - (e)  $O(n \log(n))$

- #46 Which of the following sorting routines runs in  $O(\log(n))$  time?
- (a) No sorting routine can run in  $\log(n)$  time
  - (b) Merge Sort
  - (c) Binary Sort
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- #47 Which of the follow describes the defining rule for a minimum heap?
- (a) Each parent must be greater than the left child and smaller than the right child.
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- #48 Which type of traversal will print out the elements of a binary tree in order?
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- #49 A generic type without any specified type constraints
- (a) will through runtime exceptions if an incompatible type is used.
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  - (c) will downcast types to a compatible type if needed.
  - (d) will only work with classes that implement the `Generic` interface.
  - (e) must work for any and all data types that ever have and ever will be defined.
- #50 What type of objects can be used as keys in a hash table?
- (a) Only objects that implement the `Hashable` interface.
  - (b) Any object.
  - (c) Only objects that inherit from the class `Hashtable`.
  - (d) Only objects that implement the `Comparable` interface.
  - (e) Only objects that inherit from the class `Hashable`.

Choose the BEST answer of those given and enter your choice on the Answer Sheet. You may choose multiple options, but the point value will be divided by the number of options chosen.

#1 Class String and the Char structure are found in the:

- (a) System namespace
- (b) System.Strings namespace
- (c) System.Text namespace
- (d) Strings namespace
- (e) System.Chars namespace

#2 A string literal:

- (a) contains letters and punctuation only.
- (b) contains numbers rather than letters.
- (c) contains only one character.
- (d) is a sequence of characters in double quotation marks.
- (e) contains exactly its variable name and nothing else.

#3 To create a string literal that excludes escape sequences, use:

- (a) @"string"
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- (b) binary code
- (c) a string array
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  - (d) Only objects that inherit from the class `Hashtable`.
  - (e) Only objects that inherit from the class `Hashable`.



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- (d) System.Strings namespace
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- (d) \string"
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- (d) 0 to string.Length - 1.
- (e) 1 to string.Length.

#5 string indexers treat strings as:

- (a) a character
- (b) ASCII code
- (c) arrays of characters
- (d) a string array
- (e) binary code

- #6 If an IndexOfAny method is passed an array of characters it:
- (a) finds the first occurrence of each letter in the string.
  - (b) generates an error.
  - (c) returns the number of occurrences that were found withing the string.
  - (d) searches for the first occurrence in the string of any of the characters in the array.
  - (e) will search for the first occurrence of the sequence of characters.
- #7 Concatenating with strings is done with:
- (a) reserved words.
  - (b) operator overloading.
  - (c) operator overloading and method calls.
  - (d) extension methods.
  - (e) method calls.
- #8 The proper way to convert a string to all lowercase is:
- (a) `string.ToLower( string );`
  - (b) `ToLower( string );`
  - (c) `STRING = string;`
  - (d) `string.ToLower();`
  - (e) `(lower) string;`
- #9 Which of the following is not an example of a struct:
- (a) a string
  - (b) a byte
  - (c) a char
  - (d) a double
  - (e) an int
- #10 What is the efficiency of linear search?
- (a)  $O(n^2)$ .
  - (b)  $O(\log n)$ .
  - (c)  $O(n \log n)$ .
  - (d)  $O(n)$ .
  - (e)  $O(1)$ .

- #11 What is the term used for binary search's run time?
- (a) Logarithmic run time.
  - (b) Polynomial run time.
  - (c) Constant run time.
  - (d) Quadratic run time.
  - (e) Linear run time.
- #12 What does the first pass of quicksort sort do?
- (a) Locates the smallest element in the array and swaps it into the zeroth position.
  - (b) Splits the array into two approximately equal pieces.
  - (c) Partitions the array into two unequal pieces depending on whether each element in the array is greater or less than some pivot element.
  - (d) Orders the first two elements of the array.
  - (e) Places the largest item at the end of the array.
- #13 Which of the following sorting algorithms is, on average, the fastest when sorting a large array?
- (a) Selection sort
  - (b) They all run at roughly the same speed
  - (c) Merge sort
  - (d) Insertion sort
  - (e) Quick sort
- #14 Dynamic data structures grow and shrink at \_\_\_\_\_ time.
- (a) compile
  - (b) link
  - (c) creation
  - (d) run
  - (e) load
- #15 Every simple type struct inherits from class \_\_\_\_\_.
- (a) Primitive
  - (b) ValueType
  - (c) Struct
  - (d) SimpleType
  - (e) Number

- #16 A(n) \_\_\_\_\_ conversion is when an object is cast into another type.
- (a) unboxing
  - (b) wrapping
  - (c) converting
  - (d) implicit
  - (e) boxing
- #17 A \_\_\_\_\_ class contains a reference member that refers to an object of the same class type.
- (a) self-referential
  - (b) self-linking
  - (c) self-pointing
  - (d) self-determining
  - (e) self-reflective
- #18 Usually a \_\_\_\_\_ indicates to a program the end of a data structure.
- (a) null reference
  - (b) forward slash character
  - (c) space character
  - (d) null pointer
  - (e) backslash character
- #19 An isEmpty method you write to test whether a linked list is empty is called a \_\_\_\_\_ method.
- (a) preferred
  - (b) preemption
  - (c) preorder
  - (d) predefined
  - (e) predicate
- #20 A stack is a \_\_\_\_\_ data structure.
- (a) FILO
  - (b) FOLI
  - (c) LOFI
  - (d) One-way
  - (e) LIFO

- #21 A queue is a \_\_\_\_\_ data structure.
- (a) IFOF
  - (b) One-way
  - (c) FOFI
  - (d) OFIF
  - (e) FIFO
- #22 \_\_\_\_\_ enable you to specify, with a single class declaration, a set of related classes.
- (a) Overriden classes
  - (b) Generic classes
  - (c) Overloaded classes
  - (d) Generics
  - (e) Collections
- #23 Generics provide \_\_\_\_\_ that allows the compiler to catch invalid types.
- (a) link-time type safety
  - (b) compile-time exception checking
  - (c) compile-time type safety
  - (d) compile-time error checking
  - (e) run-time type safety
- #24 When a method is called, the compiler tries to find a method that matches the \_\_\_\_\_ of the method call.
- (a) name
  - (b) name and argument types
  - (c) return type
  - (d) argument types
  - (e) name, argument types, and return type
- #25 All generic method declarations have a type parameter section delimited by \_\_\_\_\_.
- (a) angle brackets ( '<' and '>' )
  - (b) curly brackets ( '{' and '}' )
  - (c) pipes ( '|' )
  - (d) parenthesis ( '(' and ')' )
  - (e) square brackets ( '[' and ']' )

- #26 The \_\_\_\_\_ clause specifies the type constraint for type parameter T.
- (a) when
  - (b) cnstr
  - (c) types
  - (d) where
  - (e) constraint
- #27 A(n) \_\_\_\_\_ provides a means for describing a class in a type-independent manner.
- (a) parameterized class
  - (b) abstract class
  - (c) subclass
  - (d) concrete class
  - (e) generic class
- #28 Prepackaged data-structure classes provided by the .NET Framework are called \_\_\_\_\_.
- (a) DS classes
  - (b) abstract data type classes
  - (c) data structural classes
  - (d) data classes
  - (e) collection classes
- #29 Which of the following is not a collection class in C#?
- (a) ArrayList
  - (b) Hashtable
  - (c) SortedDictionary
  - (d) File
  - (e) BitArray
- #30 One should use the collections from the \_\_\_\_\_ namespace to help specify the exact type that will be stored in a collection.
- (a) System.Collections.Specialized
  - (b) System.GenericCollections
  - (c) System.Collections.Generic
  - (d) System.Collections
  - (e) System.Collections.Typed

- #31 Which of the following is not a method provided by an array?
- (a) Sort
  - (b) BinarySearch
  - (c) Index
  - (d) Copy
  - (e) Reverse
- #32 Classes which implement the IEnumerator interface must contain which of the following methods?
- (a) Reset, Current, Reverse
  - (b) MoveNext, Current, Reverse
  - (c) MoveNext, Reset, Reverse
  - (d) MoveNext, Reset, Current
  - (e) Enumerate, First, Current
- #33 How is an ArrayList different from a regular array?
- (a) it can hold objects of various types and has a dynamic size
  - (b) arrays can only hold primitive data types
  - (c) Both are the same; however one is a naming convention of C#
  - (d) the size is dynamic
  - (e) it can hold objects of various types
- #34 Peek throws a(n) \_\_\_\_\_ if the stack is empty.
- (a) InvalidOperationException
  - (b) InvalidMethodOrPropertyException
  - (c) StackEmptyException
  - (d) EmptyException
  - (e) PeekException
- #35 When two different keys "hash into" the same cell in an array, this is known as a(n) \_\_\_\_\_.
- (a) conjunction
  - (b) crash
  - (c) error
  - (d) collision
  - (e) problem

- #36 The \_\_\_\_\_ is the ratio of the number of objects stored in the hash table to the total number of cells of the hash table.
- (a) share
  - (b) proportion
  - (c) packing factor
  - (d) load factor
  - (e) density
- #37 The enumerator of a HashTable uses the \_\_\_\_\_ structure to store key-value pairs.
- (a) Relationship
  - (b) Connection
  - (c) KeyValue
  - (d) Bond
  - (e) DictionaryEntry
- #38 A(n) \_\_\_\_\_ performs a calculation that determines where to place data in the hash table.
- (a) calculator
  - (b) hash function
  - (c) indexer
  - (d) converter
  - (e) definition
- #39 A \_\_\_\_\_ is the general term for a collection of key-value pairs.
- (a) dictionary
  - (b) book
  - (c) codebook
  - (d) glossary
  - (e) lexicon
- #40 All arrays implicitly inherit from which generic interface?
- (a) IComparable
  - (b) IList
  - (c) IEnumerable
  - (d) IEnumerator
  - (e) Both IList and IEnumerable



- #41 To determine if the string object `myString` begins with the "Four" you might use
- (a) `String.StartsWith(myString, "Four")`
  - (b) `myString.StartsWith("Four")`
  - (c) `myString.BeginsWith("Four")`
  - (d) `myString[0:4] == "Four"`
  - (e) `myString.Starts("Four")`
- #42 The expression: `myString.ToUpper()`
- (a) throws an exception if `myString` contains any characters that are not letters.
  - (b) converts the contents of `myString` to all upper case.
  - (c) returns the Boolean value `True` if `myString` consists only of uppercase characters.
  - (d) does not change the contents of the object `myString`.
  - (e) is a syntax error.
- #43 To perform file processing, which namespace must be imported?
- (a) `System.IO`
  - (b) `System.FileIO`
  - (c) `System.System`
  - (d) `System.File`
  - (e) `System.Directory`
- #44 A dialog box that prevents you from interacting with any other window until you have closed it is termed a(n)
- (a) preemptive dialog.
  - (b) priority dialog.
  - (c) assertive dialog.
  - (d) modal dialog.
  - (e) blocking dialog.
- #45 Quicksort's worst-case performance is
- (a)  $O(n)$
  - (b)  $O(n^3)$
  - (c)  $O(\log(n))$
  - (d)  $O(n^2)$
  - (e)  $O(n \log(n))$

- #46 Which of the following sorting routines runs in  $O(\log(n))$  time?
- (a) Merge Sort
  - (b) No sorting routine can run in  $\log(n)$  time
  - (c) Insertion Sort
  - (d) Quick Sort
  - (e) Binary Sort
- #47 Which of the follow describes the defining rule for a minimum heap?
- (a) Each parent must be larger than either of its children.
  - (b) Each parent can be no larger than either of its children.
  - (c) Each parent must be larger than its left child and no larger than its right child.
  - (d) Each parent must be smaller than either of its children.
  - (e) Each parent must be greater than the left child and smaller than the right child.
- #48 Which type of traversal will print out the elements of a binary tree in order?
- (a) In-order traversal
  - (b) Pre-order traversal
  - (c) Post-order traversal
  - (d) Bottom-up level traversal
  - (e) Top-down level traversal
- #49 A generic type without any specified type constraints
- (a) will through runtime exceptions if an incompatible type is used.
  - (b) will only work with classes that implement the IGeneric interface.
  - (c) will only work with classes that implement the IComparable interface.
  - (d) must work for any and all data types that ever have and ever will be defined.
  - (e) will downcast types to a compatible type if needed.
- #50 What type of objects can be used as keys in a hash table?
- (a) Only objects that inherit from the class Hashable.
  - (b) Only objects that implement the IHashable interface.
  - (c) Only objects that inherit from the class Hashtable.
  - (d) Only objects that implement the IComparable interface.
  - (e) Any object.