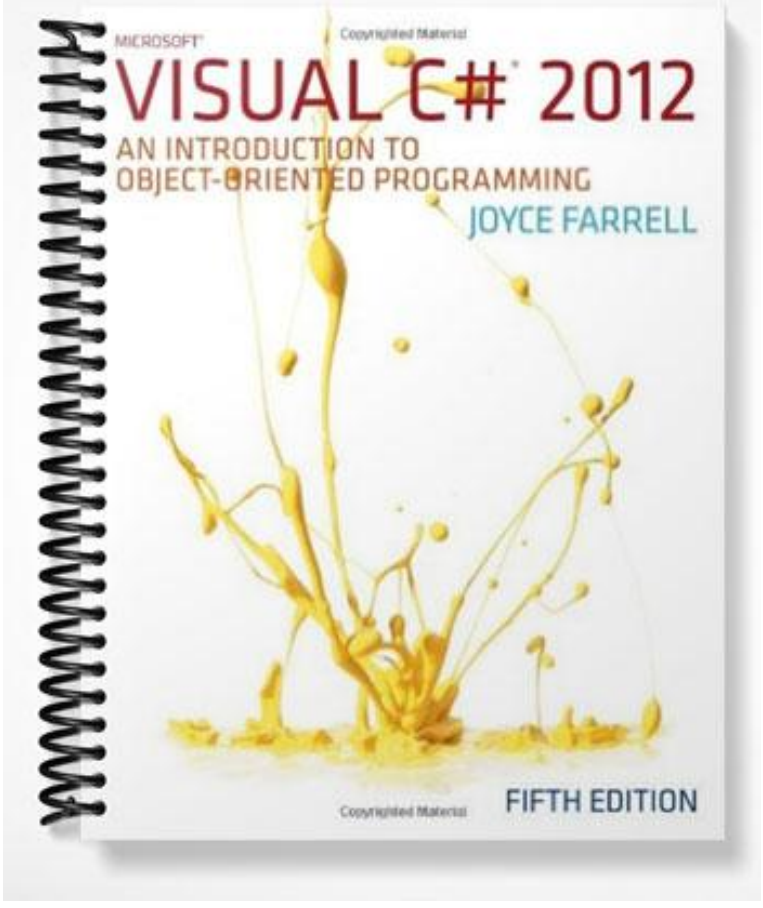
TEST BANK


MICROSOFT
Copyrighted Material
VISUAL C# 2012
AN INTRODUCTION TO
OBJECT-ORIENTED PROGRAMMING
JOYCE FARRELL
Copyrighted Material
FIFTH EDITION

ch02

True/False
Indicate whether the statement is true or false.

____ 1. With a selection structure, you perform an action or task, and then you perform the next action, in order.

____ 2. In a structured program, any structure can be nested within another structure.

____ 3. When you encounter an `eof` question in a flowchart, you know that either a selection or loop structure should begin.

____ 4. When you write a series of decisions using the `case` structure, the computer still makes a series of individual decisions.

____ 5. When you use a `while` loop, at least one performance of the action inside the loop body always occurs.

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

____ 6. The following pseudocode is an example of a(n) ____ structure:

```
get firstNumber
get secondNumber
add firstNumber and secondNumber
print result
```

a. sequence
b. decision
c. loop
d. nested

____ 7. The following pseudocode is an example of a(n) ____ structure:

```
if firstNumber is bigger than secondNumber then
  print firstNumber
else
  print secondNumber
```

a. sequence
b. decision
c. loop
d. nested

____ 8. Fill in the blank in the following pseudocode:

```
if someCondition is true then
   do oneProcess

____
   do theOtherProcess
```

a. `then`
b. `while`
c. `do`
d. `else`

____ 9. The following pseudocode is an example of a(n) ____ structure:

```
get number
while number is positive
  add to sum
  get number
```

a. sequence
b. decision
c. loop
d. nested

____ 10. Another name for a loop structure is ____.
a. execution
c. iteration

b. selection
d. case

____ 11. The following pseudocode is an example of ____.

```
do stepA
do stepB
if conditionC is true then
   do stepD
else
   do stepE
endif
while conditionF is true
   do stepG
endwhile
```

a. nesting
b. stacking
c. single alternative structures
d. a posttest

____ 12. The following pseudocode is an example of ____.

```
if conditionA is true then
   do stepE
else
   do stepB
   do stepC
   do stepD
endif
```

a. nesting
b. stacking
c. a posttest
d. a pretest

____ 13. The maximum number of entry points that any programming structure can have is ____.

a. zero
b. one
c. three
d. five

____ 14. The statement that best describes the following pseudocode is: ____.

```
if conditionA is true then
  do stepE
else
  do stepB
  if conditionF is true then
    while conditionI is true
      do stepJ
    endwhile
  else
    do stepG
  endif
 do stepD
endif
```

a. A decision is nested in a sequence
b. A decision is nested in a loop
c. A loop is nested in a decision that is nested in another decision
d. A sequence is nested inside a decision nested in another decision

____ 15. Suppose a program will read 100 data records, and you read the first data record in a statement that is separate from the other 99. This is called a ____ read.

a. nested
b. stacked
c. posttest
d. priming

____ 16. The following pseudocode reads a number from the user, multiplies it by 2 and prints the result. The ____ program statement should replace the ? to make this program functional and structured.

```
get inputNumber
while not eof
     calculatedAnswer = inputNumber * 2
     print calculatedAnswer
     ?
endwhile
```

a. `no statement is needed`
b. `if done then exit`
c. `get inputNumber`
d. `print inputNumber`

____ 17. Years ago, programmers could avoid using structure by inserting a "____" statement into their pseudocode.

a. loop
b. go next
c. next
d. go to

____ 18. Structured programs can be easily broken down into routines or ____ that can be assigned to any number of programmers.

a. segments
b. modules
c. units
d. sequences

____ 19. One way to straighten out a flowchart segment that is not structured is to use what is called the "____" method.

a. spaghetti code
b. spaghetti bowl
c. restructuring
d. priming

____ 20. The following pseudocode might be rewritten using a(n) ____ structure:

```
if class = "Freshman" then
  tuitionFee = 75
else
  if class = "Sophomore" then
    tuitionFee = 50
  else
    if class = "Junior" then
      tuitionFee = 30
    else
      tuitionFee = 10
    endif
  endif
endif
```

a. `if-then-else`
b. `case`
c. `while`
d. `do while`

____ 21. ____ is considered to be a convenience structure.

a. `if-then-else`
b. `while`
c. `case`
d. sequence

____ 22. In a `case` structure, the term ____ means "if none of the other cases were true."

a. else
b. then
c. default
d. loop

____ 23. A `case` structure can be replaced by one or more ____ structures.

a. `if-then-else`
b. `do-while`
c. `do-until`
d. `while`

____ 24. In a ____ loop, the loop body continues to execute as long as the answer to the controlling question is yes, or true.

a. do-then
b. do-when
c. do-until
d. do-while

____ 25. In a(n) ____ loop, the loop body continues to execute as long as the answer to the controlling question is no, or false.
a. do-until
b. do-while
c. while
d. if-then-else

____ 26. ____ is an example of a pretest loop.
a. do-while
b. do-until
c. while
d. case

Completion
Complete each statement.

27. A(n) _____ can contain any number of tasks, but there is no chance to branch off and skip any of the tasks.
28. Some people call the selection structure a(n) _____.
29. A group of statements that execute as a single unit is called a(n) _____.
30. In a structured loop, after the tasks execute within the loop, the flow of logic must return directly to the _____.
31. Generally, you use the case structure only when a series of decisions is based on different values stored in a(n) _____ variable.

Matching

Match each item with a statement below.
a. structure
b. priming read
c. case structure
d. decision structure
e. null case
f. stacking
g. spaghetti code
h. loop structure
i. post-test

____ 32. logically snarled program statements
____ 33. ask a question, and, depending on the answer, you take one of two courses of action
____ 34. basic unit of programming logic
____ 35. branch of a decision where nothing is done
____ 36. continue to repeat actions based on the answer to a question
____ 37. attaching structures end-to-end
____ 38. statement that reads the first input data record
____ 39. used when there are several distinct possible values for a single variable you are testing, and each value requires a different course of action
____ 40. do-while and do-until

Short Answer

41. Define the term structure as it relates to programming.

42. Describe a loop structure.

43. All logic problems can be solved using only these three structures—sequence, selection, and loop. The three structures, of course, can be combined in an infinite number of ways. What are two general ways structures can be combined?

44. What are the characteristics of a structured program?

45. Explain the difference between the representation of a decision structure and a loop in a flowchart.

46. Why is it best to use only three programming structures?

47. What is the purpose of the case structure?

48. What is the difference between a `while` and a `do-while` or `do-until` loop?

49. Describe the difference between a pretest and a posttest loop.

50. Rewrite the following as a while loop:

```
do
    pay bills
while more bills remain to be paid
```

ch02
Answer Section

TRUE/FALSE

1. ANS: F PTS: 1 REF: 46
2. ANS: T PTS: 1 REF: 53
3. ANS: T PTS: 1 REF: 58
4. ANS: T PTS: 1 REF: 70
5. ANS: F PTS: 1 REF: 73

MULTIPLE CHOICE

6. ANS: A PTS: 1 REF: 46
7. ANS: B PTS: 1 REF: 46
8. ANS: D PTS: 1 REF: 47
9. ANS: C PTS: 1 REF: 48
10. ANS: C PTS: 1 REF: 48
11. ANS: B PTS: 1 REF: 48 | 49
12. ANS: A PTS: 1 REF: 50
13. ANS: B PTS: 1 REF: 52
14. ANS: C PTS: 1 REF: 52
15. ANS: D PTS: 1 REF: 54
16. ANS: C PTS: 1 REF: 58
17. ANS: D PTS: 1 REF: 58
18. ANS: B PTS: 1 REF: 60
19. ANS: B PTS: 1 REF: 64 | 65
20. ANS: B PTS: 1 REF: 69 | 70
21. ANS: C PTS: 1 REF: 70
22. ANS: C PTS: 1 REF: 70
23. ANS: A PTS: 1 REF: 70
24. ANS: D PTS: 1 REF: 71
25. ANS: A PTS: 1 REF: 71
26. ANS: C PTS: 1 REF: 71

COMPLETION

27. ANS: sequence

    PTS: 1 REF: 46
28. ANS: if-then-else

    PTS: 1 REF: 47
29. ANS: block

PTS: 1 REF: 50

30. ANS:
loop-controlling question
loop controlling question

PTS: 1 REF: 57

31. ANS: single

PTS: 1 REF: 70

MATCHING

32. ANS: G PTS: 1 REF: 44
33. ANS: D PTS: 1 REF: 46
34. ANS: A PTS: 1 REF: 46
35. ANS: E PTS: 1 REF: 47
36. ANS: H PTS: 1 REF: 48
37. ANS: F PTS: 1 REF: 48
38. ANS: B PTS: 1 REF: 54
39. ANS: C PTS: 1 REF: 68
40. ANS: I PTS: 1 REF: 71

SHORT ANSWER

41. ANS:
In the mid-1960s, mathematicians proved that any program, no matter how complicated, can be constructed using one or more of only three structures. A structure is a basic unit of programming logic; each structure is a sequence, selection, or loop. With these three structures alone, you can diagram any task, from doubling a number to performing brain surgery. You can diagram each structure with a specific configuration of flowchart symbols.

PTS: 1 REF: 46

42. ANS:
In a loop structure, you continue to repeat actions based on the answer to a question. In the most common type of loop, you first ask a question; if the answer requires an action, you perform the action and ask the original question again. If the answer requires that the action be taken again, you take the action and then ask the original question again. This continues until the answer to the question is such that the action is no longer required; then you exit the structure. You may hear programmers refer to looping as repetition or iteration.

PTS: 1 REF: 48

43. ANS:
You can have a sequence of tasks followed by a selection, or a loop followed by a sequence. Attaching structures end-to-end is called stacking structures.

Besides stacking structures, you can replace any individual tasks or steps in a structured flowchart diagram or pseudocode segment with additional structures. In other words, any sequence, selection, or loop can contain other sequences, selections, or loops. For example, you can have a sequence of three tasks on one side of a selection. Placing a structure within another structure is called nesting the structures.

PTS: 1 REF: 48 | 50

44. ANS:
- A structured program includes only combinations of the three basic structures— sequence, selection, and loop. Any structured program might contain one, two, or all three types of structures.
- Structures can be stacked or connected to one another only at their entry or exit points.
- Any structure can be nested within another structure.

PTS: 1 REF: 53

45. ANS:
With a selection structure, the logic goes in one of two directions after the question, and then the flow comes back together; the question is not asked a second time. However, in a loop, if the answer to the question results in the loop being entered and the loop statements executing, then the logic returns to the question that started the loop; when the body of a loop executes, the question that controls the loop is always asked again.

PTS: 1 REF: 55

46. ANS:
- *Clarity*—The number-doubling program is a small program. As programs get bigger, they get more confusing if they're not structured.
- *Professionalism*—All other programmers (and programming teachers you might encounter) expect your programs to be structured. It's the way things are done professionally.
- *Efficiency*—Most newer computer languages are structured languages with syntax that lets you deal efficiently with sequence, selection, and looping. Older languages, such as assembly languages, COBOL, and RPG, were developed before the principles of structured programming were discovered. However, even programs that use those older languages can be written in a structured form, and structured programming is expected on the job today. Newer languages such as C#, C++, and Java enforce structure by their syntax.
- *Maintenance*—You, as well as other programmers, will find it easier to modify and maintain structured programs as changes are required in the future.
- *Modularity*—Structured programs can be easily broken down into routines or modules that can be assigned to any number of programmers. The routines are then pieced back together like modular furniture at each routine's single entry or exit point. Additionally, often a module can be used in multiple programs, saving development time in the new project.

PTS: 1 REF: 60

47. ANS:
You can use the case structure when there are several distinct possible values for a single variable you are testing, and each value requires a different course of action.
When using the case structure, you test a variable against a series of values, taking appropriate action based on the variable's value. To many, such programs seem easier to read, and the case structure is allowed because the same results *could* be achieved with a series of structured selections (thus making the program structured). That is, if the first program is structured and the second one reflects the first one point by point, then the second one must also be structured.

PTS: 1 REF: 68 | 70

48. ANS:
In a `while` loop, you ask a question and, depending on the answer, you might or might not enter the loop to execute the loop's procedure. Conversely, in `do-while` and `do-until` loops, you ensure that the procedure executes at least once; then, depending on the answer to the controlling question, the loop may or may not execute additional times. In a `do-while` loop, the loop body continues to execute as long as the answer to the controlling question is yes, or true. In a `do-until` loop, the loop body continues to execute as long as the answer to the controlling question is no, or false; that is, the body executes *until* the controlling question is yes or true.

PTS: 1 REF: 71

49. ANS:
In a `while` loop, the question that controls a loop comes at the beginning, or "top," of the loop body. A `while` loop is also called a pretest loop because a condition is tested before entering the loop even once. In a `do-while` or `do-until` loop, the question that controls the loop comes at the end, or "bottom," of the loop body. `Do-while` and `do-until` loops are also called posttest loops because a condition is tested after the loop body has executed.

PTS: 1 REF: 71

50. ANS:
```
pay bills
while there are more bills to pay
   pay bills
endwhile
```

PTS: 1 REF: 71 | 72