**Starting Out With C++: Early Objects, Ninth Edition**

**Solutions to End-of-Chapter Review Questions**

**Chapter 1**

1. programmed 12. key

2. CPU 13. programmer-defined symbols

3. arithmetic logic unit (ALU) and control unit 14. Operators

4. disk drive 15. Punctuation

5. operating systems and application software 16. syntax

6. instructions 17. variable

7. programming language 18. defined (or declared)

8. Machine language 19. input, processing, output

9. High-level 20. Input

10. Low-level 21. Output

11. portability 22. hierarchy chart

23. Main memory, or RAM, is volatile, which means its contents are erased when power is removed from the computer. Secondary memory, such as a disk, CD, or flash drive, does not lose its contents when power is removed from the computer.

24. Application software refers to programs used to solve specific problems or perform general operations. System software refers to programs that manage the computer's hardware devices and control their processes or that support the development of application software, such as operating system programs, utility programs, and software development tools.

25. A syntax error is the misuse of a key word, operator, punctuation, or other part of the programming language. A logical error is a mistake that tells the computer to carry out a task incorrectly or to carry out tasks in the wrong order. It causes the program to produce the wrong results.

26. Hierarchy Chart:

Calculate Customer's

Available Credit

Get Inputs

Read Credit Used

Read Max Credit

Calculate and display Available Credit

(Max Credit – Credit Used)

27. ***Account Balance High Level Pseudocode***

*Have user input starting balance*

*Have user input total deposits*

*Have user input total withdrawals*

*Calculate current balance*

*Display current balance*

***Account Balance Detailed Pseudocode***

*Input startBalance // with prompt*

*Input totalDeposits // with prompt*

*Input totalWithdrawals // with prompt*

*currentBalance = startBalance + totalDeposits - totalWithdrawals*

*Display currentBalance*

28. ***Sales Tax High Level Pseudocode***

*Have user input retail price*

*Have user input sales tax rate*

*Calculate tax amount*

*Calculate sales total*

*Display tax amount and sales total*

***Sales Tax Detailed Pseudocode***

*Input retailPrice // with prompt*

*Input salesTaxRate // with prompt*

*taxAmount = retailPrice \* salesTaxRate*

*salesTotal = retailPrice + taxAmount*

*Display taxAmount, salesTotal*

29. 45

30. 7

31. 28

32. 365

33. The error is that the program performs its math operation before the user has entered values for the variables width and length.

34. Some of the questions that should be asked are:

What standard ceiling height should be used, or is this figure to be input?

How many square feet should be subtracted out for windows and doors, or do you also want this information input since it could vary by room?

Are the ceilings also to be painted, or just the walls?

How many square feet will 1 gallon of paint cover?

How many coats of paint will you use, or should this information be input?

**Chapter 2**

1. semicolon 5. braces {}

2. iostream 6. literals (also sometimes called constants)

3. main 7. 9.7865E14

4. # 8. 1, 2

9. A) valid B) invalid C) valid

10. A) valid B) valid C) invalid

11. A) valid B) invalid C) valid only if Hello is a variable.

12. A) valid B) invalid C) valid

13. A) 11 B) 14 C) 3 (An integer divide takes place.)

14. A) 9 B) 14 C) 2

15. double temp,

weight,

height;

16. int months = 2,

days,

years = 3;

17. A) d2 = d1 + 2;

B) d1 = d2 \* 4;

C) c = ‘K’;

D) i = ‘K’;

E) i = i – 1;

18. A) d1 = d2 – 8.5;

B) d2 = d1 / 3.14;

C) c = ‘F’;

D) i = i + 1;

E) d2 = d2 + d1;

19. cout << "Two mandolins like creatures in the\n\n\n";

cout << "dark\n\n\n";

cout << "Creating the agony of ecstasy.\n\n\n";

cout << " - George Barker\n\n\n";

20. cout << "L\n"

<< "E\n"

<< "A\n"

<< "F\n";

This can also be written as a single string literal: cout << "L\nE\nA\nF\n";

21. *Input weeks // with prompt*

*days = weeks \* 7*

*Display days*

22. *Input eggs // with prompt*

*cartons = eggs / 12 // perform integer divide*

*Display cartons*

23. *Input speed // with prompt*

*Input time // with prompt*

*distance = speed \* time*

*Display distance*

24. *Input miles // with prompt*

*Input gallons // with prompt*

*milesPerGallon = miles / gallons*

*Display milesPerGallon*

25. A) 0 B) 8 C) I am the incrediblecomputing

100 2 machine

and I will

amaze

you.

26. A) Be careful!

This might/n be a trick question.

B) 23

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27. On line 1 the comments symbols are backwards. They should be /\* \*/.

On line 2 iostream should be enclosed in angle brackets.

On line 5 there shouldn't be a semicolon after int main().

On lines 6 and 13 the opening and closing braces of function main are reversed.

On line 7 there should be a semicolon after int a, b, c. In addition, the comment symbol is incorrect. It should be //.

On lines 8-10 each assignment statement should end with a semicolon.

On line 11 cout begins with a capital letter. In addition, the stream insertion operators should read << instead of >> and the variable that is ouput should be c instead of capital C.

28. Whatever problem a pair of students decides to work with they must determine such things as which values will be input vs. which will be set internally in the program, how much precision is required on calculations, what output will be produced by the program, and how it should be displayed. Students must also determine how to handle situations that are not clear cut. In the paint problem many of these considerations are listed in the teacher answer key (Chapter 1, Question 34). In the recipe program students must determine such things as how to handle quantities, like one egg, that cannot be halved. In the driving program, knowing distance and speed are not enough. Agreement should be reached on how to handle delays due to traffic lights and traffic congestion. Should this be an input value, computed as a percent of overall driving time, or handled some other way?