Chapter – 9

Introduction to C++

PART – I

I. Choose the correct answer

Question 1.
Who developed C++?
(a) Charles Babbage
(b) Bjame Stroustrup
(c) Bill Gates
(d) Sundar Pichi

Answer:
(b) Bjame Stroustrup

Question 2.
What was the original name given to C++?
(a) CPP
(b) Advanced C
(c) C with Classes
(d) Class with C

Answer:
(c) C with Classes

Question 3.
Who coined C++?
(a) Rick Mascitti
(b) Rick Bjame
(c) Bill Gates
(d) Dennis Ritchie

Answer:
(a) Rick Mascitti

Question 4.
The smallest individual unit in a program is:
(a) Program
(b) Algorithm
(c) Flowchart
(d) Tokens

Answer:
(d) Tokens

Question 5.
Which of the following operator is extraction operator of C++?
(a) >>
(b) <<
(c) <>
(d) ^^

Answer:
(a) >>

Question 6.
Which of the following statements is not true?
(a) Keywords are the reserved words convey specific meaning to the C++ compiler.
(b) Reserved words or keywords can be used as an identifier name.
(c) An integer constant must have at least one digit without a decimal point.
(d) Exponent form of real constants consists of two parts

Answer:
(b) Reserved words or keywords can be used as an identifier name.

Question 7.
Which of the following is a valid string literal?
(a) 'A'
(b) 'Welcome'
(c) 1232
(d) "1232"

Answer:
(d) “1232”

Question 8.
A program written in high level language is called as ……..
(a) Object code
(b) Source code
(c) Executable code
(d) All the above

Answer:
(b) Source code

Question 9.
Assume a = 5, b = 6; what will be result of a & b?
(a) 4
(b) 5
(c) 1
(d) 0

Answer:
(a) 4

Question 10.
Which of the following is called as compile time operators?
(a) sizeof
(b) pointer
(c) virtual
(d) this

Answer:
(a) sizeof

PART – II

II. Answer to all the questions

Question 1.
What is meant by a token? Name the token available in C++.

Answer:
C++ program statements are constructed by many different small elelments such as commands, variables, constants and many more symbols called as operators and punctuators. Individual elements are collectively called as Lexical units or Lexical elements or Tokens. C++ has the following tokens:

1. Keywords
2. Identifiers
3. Literals
4. Operators
5. Punctuators

Question 2.
What are keywords? Can keywords be used as identifiers?

Answer:
Keywords are the reserved words which convey specific meaning to the C++ compiler. They are the essential elements to construct C++ programs. Most of the keywords are common to C, C++ and Java. Keywords are reserved and cannot be used as identifiers.

Question 3.
The following constants are of which type?

1. 39
2. 032
3. OXCAFE
4. 04.14

Answer:

1. 39 – Decimal
2. 032 – Octal
3. OXCAFE – Hexadecimal
4. 04.14 – Decimal

Question 4.
Write the following real constants into the exponent form:

1. 23.197 00
2. 7.214
3. 0.00005
4. 0.319

Answer:

1. $23.197 = 0.23197 \times 10^2 = 0.23197E2$
2. $00\ 7.214 = 0.7214 \times 10^1 = 0.7214E1$
3. $0.00005 = 0.5 \times 10^{-4} = 0.5E - 4$
4. $0.319 = 3.19 \times 10^{-1} = 3.19E - 1$

Question 5.
Assume n = 10; what will be result of n>>2;?

Answer:

Operator	Operation	Result
>>	n>>2	0 0 0 0 1 0 1 0 n = 10
		0 0 0 0 1 0 0 0 n >> 2
		0 0 0 0 0 0 1 0
n>>2 = $(00000010)_2 = 2_{10}$		

Question 6.
Match the following:

A	B
(a) Modulus	(1) Tokens
(b) Separators	(2) Remainder of a division
(c) Stream extraction	(3) Punctuators
(d) Lexical Units	(4) get from

Answer:

A	B
(*a*) Modulus	(2) Remainder of a division
(*b*) Separators	(3) Punctuators
(*c*) Stream extraction	(4) get from
(*d*) Lexical Units	(1) Tokens

PART – II

III. Answer to all the questions

Question 1.
Describe the differences between keywords and identifiers?

Answer:

Keywords:

- Keywords are the reserved words which convey specific meaning to the C++ compiler.
- They are essential elements to construct C++ programs.
- Most of the keywords are common to C, C++ and Java.

Identifiers:

- Identifiers are the user-defined names given to different parts of the C++ program.

- They are the fundamental building blocks of a program.
- Every language has specific rules for naming the identifiers.

Question 2.
Is C++ case sensitive? What is meant by the term "case sensitive"?

Answer:
C++ is a case sensitive programming language so, all the keywords must be in lowercase. Case sensitive means that the uppercase and lowercase letters are considered differently.

Question 3.
Differentiate "=" and "==".

Answer:

=	= =
'=' is an assignment operator	'= =' is an equal to operator and it is a relational operator.
It is used to assign the value of variable or expression	It is used for comparison of both left and right-side operands.

Question 4.
Assume a = 10, b = 15; What will be the value of a^b?

Answer:

Operator	Operation	Result	
^	a^b	0 0 0 0 1 0 1 0	a
		0 0 0 0 1 1 1 1	b
		0 0 0 0 0 1 0 1	a^b
a^b = $(00000101)_2 = 5_{10}$			

Question 5.
What is the difference between "Run time error" and "Syntax error"?

Answer:
Run – time Error:

- A run time error occurs during the execution of a program. It occurs because of some illegal operation that takes place.
- For example, if a program tries to open a file which does not exist, it results in a run – time error.

Syntax Error:

- Syntax errors occur when grammatical rules of C++ are violated.
- Example: if you type as follows, C++ will throw an error.
  cout << "Welcome to Programming in C++"

Question 6.
What are the differences between "Logical error" and "Syntax error"?

Answer:
Logical Error : Logical errors occur when there is an incorrect usage of variable / operator / order of execution etc. It is also called as Semantic Error.

Syntax Error : Syntax errors occur when grammatical rules of C++ are violated.

Question 7.
What is the use of a header file?

Answer:
Header files contain definitions of Functions and Variables, which is imported or used into any C++ program by using the pre – processor #include statement. Header files have an extension ".h" which contains C++ function declaration and macro definition.
Example: #include

Question 8.
Why is main function special?

Answer:
C++ program is a collection of functions. Every C++ program must have a main function. The main() function is the starting point where all C++

programs begin their execution. Therefore, the executable statements should be inside the main() function.

Question 9.
Write two advantages of using include compiler directive.

Answer:

1. The program is broken down into modules, thus making it more simplified.
2. More library functions can be used, at the same time size of the program is retained.

Question 10.
Write the following in real constants.

1. 15.223
2. 211.05
3. 0.00025

Answer:

1. $15.223 = 0.15223E2$
2. $211.05 = 0.21105E3$
3. $0.00025 = 0.25E - 3$

PART – IV

IV. Answer all the questions

Question 1.
Write about Binary operators used in C++.

Answer:
Binary Operators require two operands:
Arithmetic operators that perform simple arithmetic operations like addition,

subtraction, multiplication, division (+, -, *, %, /) etc. are binary operators which requires minimum of two operands.

Relational operators are used to determine the relationship between its operands. The relational operators (<, >, >=, <=, ==, !=) are applied on two operands, hence they are binary operators. AND, OR (logical operator) both are binary operators. Assignment operator is also a binary operator (+=, – =, *=, /=, %=).

Question 2.
What are the types of Errors?

Answer:

Type of Error	Description
Syntax Error	Syntax errors occur when grammatical rules of C++ are violated.
Semantic Error	Semantic Error occur when there is wrong use of variable / operator / order of execution etc. It is also called as Logical Error.
Run – time error	A run time error occurs during the execution of a program. It is occurs because of some illegal operation that takes place.

Question 3.
Assume a = 15, b = 20; What will be the result of the following operations?
(a) a&b
(b) a|b
(c) a^b
(d) a>>3
(e) (~b)

Answer:

Operator	Operation	Result
&	a&b	0 0 0 0 1 1 1 1 a
		0 0 0 1 0 1 0 0 b
		a&b = $(00000100)_2 = 4_{10}$
|	a|b	0 0 0 0 1 1 1 1 a
		0 0 0 1 0 1 0 0 b
		a|b = $(00011111)_2 = 31_{10}$
^	a^b	0 0 0 0 1 1 1 1 a
		0 0 0 1 0 1 0 0 b
		a^b = $(00011011)_2 = 27_2$
>>	a>>3	0 0 0 0 1 1 1 1 a
		0 0 0 0 0 0 0 1
		a>>3 = 1
~	~b	b = 0 0 0 1 0 1 0 0 a
		~b = –21

PART – I

I. Choose the correct answer

Question 1.
How many categories of data types available in C++?
(a) 5
(b) 4
(c) 3
(d) 2

Answer:
(c) 3

Question 2.
Which of the following data types is not a fundamental type?

(a) signed
(b) int
(c) float
(d) char

Answer:
(a) signed

Question 3.
What will be the result of following statement?
char ch= 'B';
cout<< (int) ch;
(a) B
(b) b
(c) 65
(d) 66

Answer:
(d) 66

Question 4.
Which of the character is used as suffix to indicate a floating point value?
(a) F
(b) C
(c) L
(d) D

Answer:
(a) F

Question 5.
How many bytes of memory allocates for the following variable declaration if you are using Dev C++? short int x;
(a) 2
(b) 4
(c) 6
(d) 8

Answer:
(a) 2

Question 6.
What is the output of the following snippet?
charch =‘A’;
ch = ch + 1;
(a) B
(b) A1
(c) F
(d) 1A

Answer:
(a) B

Question 7.
Which of the following is not a data type modifier?
(a) signed
(b) int
(c) long
(d) short

Answer:
(b) int

Question 8.
Which of the following operator returns the size of the data type?
(a) sizeof()
(b) int ()
(c) long ()
(d) double ()

Answer:
(a) sizeof()

Question 9.
Which operator is used to access reference of a variable?
(a) $

(b) #
(c) &
(d) !

Answer:
(c) &

Question 10.
This can be used as alternate to endl command:
(a) \t
(b) \b
(a) \0
(d) \n

Answer:
(d) \n

PART – II

II. Answer to all the questions

Question 1.
Write a short note const keyword with an example.

Answer:
const is the keyword used to declare a constant, const keyword modifies / restricts the accessibility of a variable. So, it is known as Access modifier.

Question 2.
What is the use of setw( ) format manipulator?

Answer:
setw manipulator sets the width of the field assigned for the output. The field width determines the minimum number of characters to be written in output.
Syntax:
setw(number of characters)

Question 3.
Why is char often treated as integer data type?

Answer:
Character data type accepts and returns all valid ASCII characters. Character data type is often said to be an integer type, since all the characters are represented in memory by their associated ASCII Codes. If a variable is declared as char, C++ allows storing either a character or an integer value.

Question 4.
What is a reference variable? What is its use?

Answer:
Reference variable in C++ is alias for existing variable. They store nothing but the address of the variable used at the time of its declaration. It is important to assign the reference variable at the time of declaration, else it will show an error.

Question 5.
Consider the following C++ statement. Are they equivalent?
char ch = 67;
charch = 'C';

Answer:
Both the statements are equivalent as they declare 'ch' to be char and initialize it with the value of 67. Since this is the ASCII code for 'C', the character constant also can be used to initialize 'ch' to 67.

Question 6.
What is the difference between 56L and 56?

Answer:
56L – The suffix L forces the constant to be represented as long, which occupies 4 bytes.

56 – This will be represented as int type constant which occupies 2 bytes as per Turbo C++.

Question 7.
Determine which of the following are valid constant? And specify their type.

1. 0 0.5
2. 'Name'
3. '\t'
4. 27,822

Answer:

1. 0.5 – is a valid constant. It is a decimal.
2. 'Name' – Invalid constant as single quote is not allowed.
3. '\t' – Escape sequence (or) non – graphical character (horizontal tab).
4. 27,822 – Invalid constant. Comma is not allowed.

Question 8.
Suppose x and y are two double type variable that you want add as integer and assign to an integer variable. Construct a C++ statement for the doing so.

Answer:
double x = 10.5, y = 4.5; int a;
a = int (x) + int (y);

Question 9.
What will be the result of following if num=6 initially.
(a) cout << num;
(b) cout << (num==5);

Answer:
(a) 6 (b) False

Question 10.
Which of the following two statements are valid? Why? Also w rite their result,
int a; a = 3,014; a=(3,014);

Answer:
It is invalid as comma is not allowed in an integer constant. It is valid. Comma in bracket is allowed.

PART – III

III. Answer to all the questions

Question 1.
What are arithmetic operators in C++? Differentiate unary and binary arithmetic operators. Give example for each of them.

Answer:
Arithmetic operators : perform simple arithmetic operations like addition, subtraction, multiplication, division etc.
Unary Operators : Require only one operand . Example: +, -, *, /, %, >, <, <=, AND, OR

Binary Operators:

1. Require two operands
2. Example: ++ (Plus, Plus) Increment operator, – – (Minus, Minus) Decrement operator, NOT, ~,

Question 2.
Evaluate x + = x + + + x; Let x = 5;

Answer:
x + = x + + + x (x = 5) x + = x + + + 5 (x becomes 6)
x + = 6 + 6
x + = 12
x = 6 + 12
x = 18

Question 3.
How relational operators and logical operators are related to one another?

Answer:

Relational operators are used to determine the relationship between its operands. When the relational operators are applied on two operands, the result will be a Boolean value 1 or 0 which represents True or False respectively which represents logical operator.

Question 4.

Evaluate the following C++ expressions where x, y, z are integers and m, n are floating point numbers. The value of x = 5, y = 4 and m = 2.5;

Answer:

1. n = x + y / x;
2. z = m * x + y;
3. z = (x++) * m + x;

Answer:

1. n = x + y / x;
= 5 + 4/5
= 5 + 0 (both x and y are int type. Therefore, only integer part of quotient is considered)
=5

2. z = m * x + y;
= 2.5 * 5 + 4 (m is float type, so x value is promoted to float [implicit conversion])
= 12.5 + 4 ‘
= 16 (2 is int type. So ‘.2’, the fractional part is discarded)

3. z = (x++) * m + x;
= 5*2.5 + x
= 12.5 + 5
= 18 (z is int type, therefore the fractional part is removed, x is incremented after the addition)