Question 1.
Explain two benefits of higher-level programming languages over assembly languages.

Question 2.
Explain at least two advantages and two disadvantages of C++ over other programming languages.

Question 3.
How do you discover syntax errors? How do you discover logic errors?

Question 4.
Write an algorithm to settle the following question: A bank account starts out with $10,000. interest is compounded monthly at 6 percent per year (0.5 percent per month). Every month, $500 is withdrawn to meet college expenses. After how many years is the account depleted? After writing your algorithm use it to give an answer to the problem.

Question 5.
Write the following mathematical expression in C++.
\[ s = s_0 + v_0 t + \frac{1}{2} gt^2 \]
\[ G = 4\pi^2 \frac{a^3}{p^2(m_1 + m_2)} \]
\[ FV = PV \cdot \left(1 + \frac{INT}{100}\right)^{YRS} \]
\[ c = \sqrt{a^2 + b^2 - 2ab\cos y} \]

Question 6.
Write the following C++ expressions in mathematical notation.
1. \[ dm = m \ast \frac{\sqrt{1 + v / c}}{\sqrt{1 - v / c}} - 1; \]
2. \[ volume = \pi \ast r \ast r \ast h; \]
3. \[ volume = 4 \ast \pi \ast \text{pow}(r, 3) / 3; \]
4. \[ p = \text{atan2}(z, \sqrt{x \ast x + y \ast y}); \]
**Question 7.**
Find at least five syntax errors in the following program:

```cpp
#include <iostream>

int main()
{
    cout << "Please enter two numbers:" << x, y;
    cin >> x, y;
    cout << "The sum of " << x << " and " << y << " is: " << x + y << endl;
    return;
}
```

**Question 8.**
Explain the differences between 2, 2.0, "2", and "2.0".

**Question 9.**
How do you get the first character of a string? The last character? How do you remove the first character? The last?

**Question 10.**
What are the values of the following expressions? In each line, assume that:

```cpp
double x = 2.5;
double y = -1.5;
int m = 18;
int n = 4;
string s = "Hello";
string t = "World";
```

1. x + n * y - (x + n) * y
2. m / n + m % n
3. 5 * x - n / 5
4. sqrt(sqrt(n))
5. s + t
6. t + s
7. 1 - (1 - (1 - (1 - (1 - n))))
8. s.substr(1,2)
9. s.length() + t.length()