Question 1

```
class Animal
{
    public virtual string speak(int x) { return "silence"; }
}

class Cat : Animal
{
    public string speak(int x) { return "meow"; }
}

class Dog : Animal
{
    public string speak(short x) { return "bow-wow"; }
}
```

Question: Explain why the block below does not emit “bow-wow”:

```
Animal d = new Dog();
Console.Write(d.speak(0));
```

Answer

The Dog and Cat classes should use the override keyword to extend the Animal class. When executing the code block as defined, the output of speak will be “silence” because Dog does not override the speak method.

Secondly, the speak method in the Dog class defines x as a short instead of an int.

Solution:

```
class Animal
{
    public virtual string speak(int x) => "silence";
}

class Cat : Animal
{
    public override string speak(int x) => "meow";
}

class Dog : Animal
{
    public override string speak(int x) => "bow-wow";
}
```

Question 2

```
1.class A
2.{
3.    public int a { get; set; }
4.    public int b { get; set; }
5.}
6.
7.class B
8.{
9.    public const A a;
10.   public B()
11.   {
12.       a.a = 10;
13.   }
14.}
15.
16.int main()
17.{
18.    var b = new B();
19.    Console.WriteLine("%d %d\n", b.a.a, b.a.b);
20.    return 0;
21.}
```

Question: Outline any issues/concerns with the implemented code.

Answer

The first issue is with line 9. Constants must be a string literal or a value type, not a reference type. Another issue is with the Console.WriteLine statement, which is using C, C++ formatting (%d). The last issue is that the entry point method is not defined correctly. It should be named Main, static, capitalized, and inside a class.

The following solution will output “10 0”:

```
class A
{
    public int a { get; set; }
    public int b { get; set; }
}

class B
{
    public readonly A a = new ();
    public B()
    {
        a.a = 10;
    }
}
```

Code Analysis Questions and Answers

```
class Program
{
    static int Main()
    {
        var b = new B();
        Console.WriteLine($"{b.a.a} {b.a.b}");
        return 0;
    }
}
```