

Quiz 5 (Scope & Parameters)

Started: May 28 at 9:44pm

Quiz Instructions

Question 1

10 pts

What is the value of the following expression?

```
let x = 2 in (let x=1 in x,x)
```

- ☐ 2
- ☐ (2,1)
- ☐ 1
- ☐ (2,2)
- ☒ (1,2)
- ☐ (1,1)

Question 2

10 pts

What is the runtime stack under **dynamic** scoping and CBV immediately after the statement on line 9?

```
1 { int x;  
2   x := 4;  
3   { int f (int y) {
```

```
4      x := x+y;
5      return (x+1);
6    };
7    { int x;
8      x := 6;
9      x := f(x-1);
10   };
11 };
12 }
```

☐ [x:6, f:{}, x:2]

☐ [x:5, f:{}, x:4]

☐ none of these answers

☒ [x:12, f:{}, x:4]

☐ [x:12]

Question 3

10 pts

What is the runtime stack under dynamic scoping and CBV immediately after the statement on line 8?

```
1 { int x;
2   x := 4;
3   { int f (int y) {
4     x := x+y;
5     return (x+1);
6   };
7   { int x;
8     x := 6;
9     x := f(x-1);
10  };
11 };
12 }
```

☐ [x:4, f : {}, x:6]

- ☐ [x:6, f : {}]
- ☐ None of these answers
- ☒ [x:6, f : {}, x:4]
- ☐ [f : {}, x:4]

Question 4

10 pts

What is the runtime stack under **static scoping** and CBV immediately after the statement on line 8?

```
1 { int x;  
2   x := 4;  
3   { int f (int y) {  
4     x := x+y;  
5     return (x+1);  
6   };  
7   { int x;  
8     x := 6;  
9     x := f(x-1);  
10  };  
11 };  
12 }
```

- ☐ [x:6, x:4]
- ☐ [x:6, f: {}]
- ☐ [x:4, f: {}, x:6]
- ☐ None of these answers
- ☒ [x:6, f: {}, x:4]

Question 5

10 pts

What is the runtime stack under **static scoping** and CBV immediately after the statement on line 4?

```
1 { int x;  
2   x := 4;  
3   { int f (int y) {  
4     x := x+y;  
5     return (x+1);  
6   };  
7   { int x;  
8     x := 6;  
9     x := f(x-1);  
10  };  
11 };  
12 }
```

☐ None of these answers

☐ [y: 3, x: 9, f: {}, x: 4]

☐ [y: 3, x: 6, f: {}, x: 7]

☐ [y: 5, x: 11, f: {}, x: 4]

☒ [y: 5, x: 6, f: {}, x: 9]

Question 6

10 pts

What is the the value of z after the statement on line 5 using **dynamic scoping** and CBV?

```
1 {int z := 2;  
2   {int f(int x) {return x-2};  
3     {int g(int y) {return f(y)};  
4       {int f(int x) {return x+2};  
5         z := g(6);  
6     }
```

☐ 5

☐ 4

☒ 8

☐ 6

Question 7

10 pts

What is the the value of z after the statement on line 5 using **static scoping** and CBV?

```
1  {int z := 1;
2    {int f(int x) {return x+1};
3      {int g(int y) {return f(y)};
4        {int f(int x) {return x-1};
5          z := g(4);
6          .....
```

☒ 5

☐ 4

☐ 3

☐ 1

Question 8

10 pts

Using Call-By-Reference (CBR), what is the value of z after the statement on line 10?

```
1  {int z;  
2   int y;  
3   y := 6;  
4   {int f(ref int x) {  
5       x:= x-1;  
6       y:= x+4;  
7       x:= x-1;  
8       return x;  
9   };  
10  z := y + f(y);  
11  };
```

- ☐ 11
- ☐ 16
- ☒ 14
- ☐ 12
- ☐ None of these

Question 9

10 pts

Using Call-By-Value-Result (CBVR), what is the value of z after the statement on line 10?

```
1  {int z;  
2   int y;  
3   y := 6;  
4   {int f(valres int x) {  
5       x:= x-1;  
6       y:= x+4;  
7       x:= x-1;  
8       return x;  
9   };  
10  z := y + f(y);  
11  };
```

- ☐ None of these

☐ 6

☐ 4

☒ 10

☐ 8

Question 10

10 pts

Using Call-By-Need (CBNeed), what is the value of y after the statement on line 7?

```
1  {int y;  
2    y := 6;  
3    {int f (int x) {  
4      y:= x+4;  
5      return (y+x);  
6    };  
7    y := f(y+2);  
8  };
```

☐ 14

☐ 26

☐ 16

☒ 20

☐ None of these