

6. Consider the following JavaScript skeletal program:

// The main program

```
var x;  
function sub1() {  
    var x;  
    function sub2() {  
        ...  
    }  
}  
function sub3() {  
    ...  
}
```

Assume that the execution of this program is in the following unit order:

- main calls sub1
- sub1 calls sub2
- sub2 calls sub3

a. Assuming static scoping, in the following, which declaration of x is the correct one for a reference to x?

- I. Sub1 sub1
- II. Sub2 sub1
- III. Sub3 main

b. Repeat part a, but assume dynamic scoping.

- I. Sub1 sub1
- II. Sub2 sub1
- III. Sub3 sub1

7. Assume the following JavaScript program was interpreted using static-scoping rules.

```
var x;  
function sub1() {  
    document.write("x = " + x + "");  
}  
function sub2() {  
    var x;  
    x = 10;  
    sub1();  
}  
x = 5;  
sub2();
```

What value of x is displayed in function sub1? Under dynamic-scoping rules, what value of x is displayed in function sub1?

Static Scoping: x = 5

Dynamic Scoping: x=10

9. Consider the following Python program:

```
x = 1;
y = 3;
z = 5;
def sub1():
    a = 7;
    y = 9;
    z = 11;
    ...
def sub2():
    global x;
    a = 13;
    x = 15;
    w = 17;
    ...
    def sub3():
        nonlocal a;
        a = 19;
        b = 21;
        z = 23;
        ...
...

```

List all the variables, along with the program units where they are declared, that are visible in the bodies of sub1, sub2, and sub3, assuming static scoping is used.

	<u>Variable</u>	<u>Where it's defined</u>
In sub 1:	a	sub1
	x	main
	y	sub1
	z	sub1
In sub 2:	a	sub2
	w	sub2
	x	sub2
	y	main
	z	main
In sub 3:	a	sub3
	b	sub3
	w	sub2
	x	sub2
	y	main
	z	sub3