1) Some programming languages are typeless. What are the obvious advantages and disadvantages of having no types in a language?

2) Dynamic type binding is closely related to implicit heap-dynamic variables. Explain this relationship.

3) Consider the following JavaScript skeletal program:

```javascript
// 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
4) Assume the following JavaScript program was interpreted using static-scoping rules. What value of $x$ is displayed in function `sub1`? Under dynamic-scoping rules, what value of $x$ is displayed in function `sub1`?

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