Quiz #3

Time: 20 minutes

Instructions: Total 10 marks. Closed Book. Answer all questions in the space provided.

1. (3 marks) What is the primary purpose of each of the following in the abstract machine model outlined in the book and in class? That is, what programming language concepts are each of these primarily designed to model?
   a. Run Stack
   b. Display

2. (2 Marks) What are the two primary responsibilities of the Semantic Analysis phase of a compiler, and what is the main question answered by each?
   a.
   b.
3. (2 Marks) What two distinct purposes are served by the Type Stack in Semantic Analysis?

a.

b.

4. (3 marks) Consider the following program.

```pascal
var k: integer
var i: integer
procedure P (var n: integer)
  var m: integer
  m := 789
  n := k + 2 * m
end P
i := 123
k := 456
P (i)
```

Using the abstract machine instructions `push, pushaddress, subtract, add, multiply, evaluate, assign` and so on defined in the book, translate the following statement (ONLY) of above program into abstract machine code. Use (LL,ON) pairs, not variable names, to refer to variables in your answer.

```pascal
n := k + 2 * m
```