

2016 Midterm Exam for Compiler (Totally 4 pages)

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1. (10%) Manually execute the following program

```
program parameter-passing;
  var i: integer;
      a: array [1..3] of integer;
  procedure mess(v : integer);
    var i: integer;
  begin
    i:= 3;
    v := v + 1;
    a[i] := a[i] + 12;
    i := 1;
    v := v + 1;
  end;
begin
  for i:= 1 to 3 do a[i] := 9;
  a[2] := 5;
  i := 2;
  mess(a[i]);
  ...          <----- Observation Point 1
end.
```

- (a) if by assuming Call-by-Text, what's the value in the array a and the variable i in the observation point 1 of the program?
(a[1]=?,a[2]=?,a[3]=?,i=?)
- (b) If by assuming Call-by-Need, what's the value in the array a and the variable i in the observation point 1 of the program?
(a[1]=?,a[2]=?,a[3]=?,i=?)