1.(1)Indicate the output from the following program. (8%)

```
PROGRAM FOUR(INPUT,OUTPUT);
VAR I,J,X: INTEGER;

PROCEDURE P1(VAR X: INTEGER);
BEGIN
    I:=I+1;
    X:=73;
    WRITELN(X);
END; (*OF P1*)

BEGIN (*MAIN*)
 I:=100;
 X:=200;
 P1(X);
 WRITELN(X,I);
 P1(I);
 WRITELN(X,I);
END.
```

(2)What would be the output if X were passed by value instead of VAR? (7%)

2.Write a pseudo program that reads-in up to ten numbers and prints them out from smallest to largest and THEN prints them out in the original order as they were read in. (10%)

You may use TWO arrays, but 5 points will be deducted from your score if you do so.

3.(a)Show the representation of 63 as a 16-bit integer. (4% each)
  (b)Show the representation of -63 as a 16-bit integer.
     (use the twos-complement representation)
  (c)Show the representation of 8.875 as a 16-bit floating point number, which is composed of 1 sign bit, 6 exponent bits and 9 mantissa bits.
  (d)Show the representation of -0.875 as a 16-bit floating point number. (use the twos-complement representation)

4.Design an algorithm to solve each of the following problems. (10%)
  (1)Determine whether a number is a power of 2.
  (2)Determine whether a number is a prime number.

5.Please explain the following terminologies: (20%)
  (a) X window,   (b) Four generation language (4GL),
  (c) Multimedia,   (d) Network protocal,
  (e) Virtual Reality,   (f) Data security,
  (g) Speech recognition,   (h) Fuzzy theory,
  (i) Image Analysis,   (j) Distributed computing environment (DCE).

6.(a)Write a recursive routine that will read a single line of characters (delimited by a period) and will write the reverse of that string, less the period. (You can use whatever programming language, 7%)
  (b)Give one advantage and one disadvantage to the use of recursion. (8%)

7.Convert the infix expression X+Y*(-Z+66) into:
  (a) trees   (5%)
  (b) postfix   (5%)
  (c) prefix.   (4%)