Subject Code: CS-306,   Subject: Principles of Programming Language
Semester: 6th,   Department: Computer Science and Engineering
Duration: 30 min(Upload time included),   Total Marks: 10

Figure in the right hand margin indicates full marks for the question.
All questions are compulsory.

1. Consider the following simple language. a and b represent names of integer variables. Each statement may have a label as a prefix. Statements in the language are as follows:

`a=b`	Assign `a` the value of `b`
`a=a+1`	Add `1` to `a`
`a=a-1`	Subtract `1` from `a`
`if a=0 then goto L`	If `a=0`, transfer control to statement `L`
`if a>0 then goto L`	If `a>0`, transfer control to statement `L`
`goto L`	Transfer control to statement `L`
`halt`	Stop execution

   The program that computes $a = a + b$ can be given by:

   ```
   L:   a=a+1
        b=b-1
        if b>0 then goto L
        halt
   ```

   (a) Given a and b write a program in the language to compute
   $x = a/b$ `if` $b > 0$ and $a > b$
   `else` $x = a\%b$ `if` $b > 0$ and $a <= b$.

   (b) Give a minimal set of extensions needed to make this language easy to use with respect to the above computation. Consider concepts like subprograms, new statements, declarations, and so on.

   $(5+5)$