MTECH COMPUTER SCIENCE AND ENGINEERING

ADVANCED COMPILER DESIGN (RCE 2005)

MODEL QUESTION PAPER (2013 SCHEME)

Marks: 60
Time: 3 hrs

Answer any **TWO** from each module (Each question carries 10 marks)

MODULE I

1. a. Translate the following statements into three address statements and construct the flowgraph.(10)

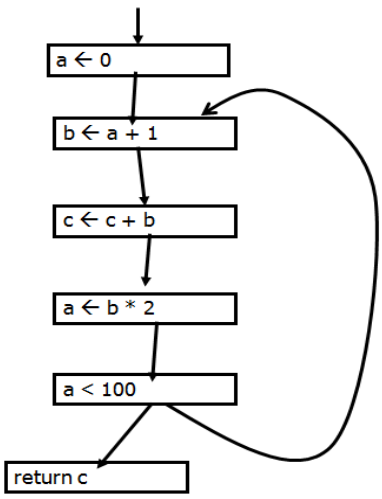
```
for(i=0;i<n;i++)
for(j=0;j<n;j++)
c[i][j]=0.0
                    for(i=0;i<n;i++)
                    for(j=0;j<n;j++)
                              for(k=0;k<n;k++)
                              c[i][j]=c[i][j]+a[i][k]*b[k][j]
```

   b. Identify Loops in the above code. (10)

   c. Write notes on Symbol Table Management. (10)

MODULE II

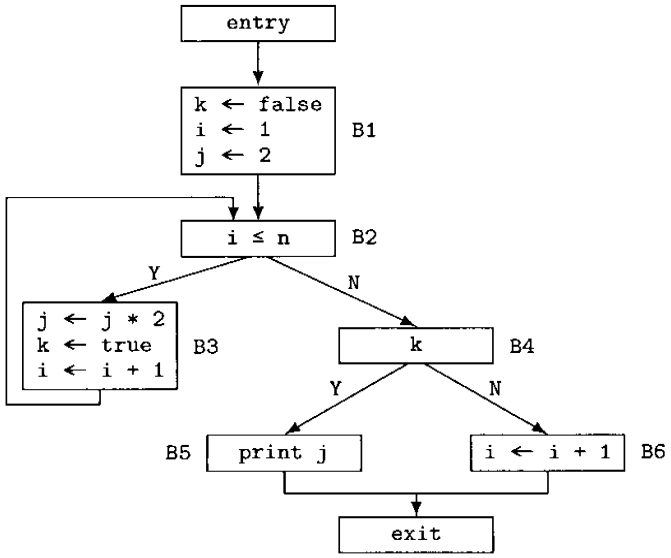
2. a. Give the dataflow equations for liveness analysis. Perform the liveness analysis on the following flow graph.(10)



b. Perform loop invariant code motion with the following code segment. (10)

```
B=2
i=1
L3: if i>100 goto L4
a=b+1
c=2
if I mod 2 == 0 goto L1
d=c; f=a+1; L2: i=i+1;
if a<2 goto L4
goto L3
L1: d=a+d
e=I+d
goto L2
L4: end
```

c. What is Static Single Assignment form? Transform the following code into SSA form. (10)



MODULE III

3. a. Explain register allocation algorithm with coalesing. Do register allocation with coalesing on the following code. Make necessary assumptions.

```
c=a
p=b
if p=0 goto L1
b=mem[p]
s=b
b=mem[p+4]
t=b
u=s+t
goto L2
L1: u=1
```

L2:b=u
a=c

b. Write notes on Procedure Optimisation.(10)
c. Write notes on Instruction Code Scheduling.(10)