St. Joseph's Institute of Technology
St. Joseph's College of Engineering
Department of CSE/IT
Assignment-V
CS6660-Compiler Design

Part-A

1) What are the principle sources of optimization?
2) What are the methods available in loop optimization?
3) Define loop unrolling with example
4) What is meant by copy propagation or variable propagation?
5) Define busy expressions.
6) How do you calculate the cost of an instruction?
7) What do you mean by DAG? List the advantages of DAGs
8) What are the different storage allocation strategies?

Part-B

1. Perform analysis of available expressions on the following code by converting into basic blocks and compute global common sub expression elimination.

I:=0
A:=n-3
If i<a then loop else end
Label loop
B:=i_4
E:=p+b
D:-m[c]
E:=d-2
F:=I-4
G:=p+f
M[g]:=e
I:=i+1
A:=n-3
If i<a then loop else end
Label end

2. Define a Directed Acyclic Graph. Construct a DAG and write the sequence of instructions for the expression a+a*(b-c)+(b-c)*d

3. (i) Write the code generation algorithm using dynamic programming and generate code for the statement x=a/(b-c)-s*(e+f) [Assume all instructions to be unit cost] (12)

(ii)Explain the issues in design of code generator. (4)

4. (i) Explain Loop optimization in details and apply it to the code (10)

```
I:=0
A:=n-3
If i<a then loop else end
Label loop
B:=i_4
E:=p+b
D:-m[c]
E:=d-2r54
F:=I-4
G:=p+f
M[g]:=e
I:=i+1
A:=n-3
```

(ii) What are the optimization technique applied on procedure calls? Explain with example .(6)