2000 Paper 13 Question 7

Compiler Construction

Describe how a parse tree can be translated into a sequence of assembly language instructions based on a pattern matching graph derived from a set of tree rewriting rules where each rule has a cost and a corresponding fragment of code. Illustrate your answer using the following rules:

```
Ri = Kk                    LDI  Ri,Kk     Cost 2
Ri = add(Ri,Kk)            ADDI Ri,Kk     Cost 3
Ri = add(Ri,Rj)            ADD  Ri,Rj     Cost 3
Ri = add(Ri,add(Rj,Kk))    ADD  Ri,Rj,Kk  Cost 4
```

applied to the following parse tree:

```
add(K1,add(add(K2,add(K3,K4)),add(K5,K6)))
```

[15 marks]

Discuss the advantages and disadvantages of this approach to code generation. [5 marks]