(g) What are the reasons for spliting analysis phase to lexical analysis and synatax analysis ?

(h) What are the advantages and disadvantages of intermediate language ?

(i) What is the purpose of symbol table ?

(j) Define backpatching.

2. (a) With the help of a diagram, briefly explain the various phases of a compiler. 5

(b) What do you understand by a single-pass compiler ? Discuss its merits and demerits. 5

3. (a) How can NFA be generated from regular expression ? Explain all the steps. 5

(b) Explain the left-recursion and show how it is eliminated ? Describe the algorithm used for eliminating left-recursion. 5

4. (a) What is an activation record ? Explain the purpose of each item in the activation record. 5

(Continued)

(b) Consider the following context free -grammar :

$S \rightarrow EN$

$E \rightarrow E + T \mid E\text{-}T \mid T$

$T \rightarrow T * F \mid T/F \mid F$

$F \rightarrow (E) \mid \text{digit}$

$N \rightarrow ;$

Obtain the syntax directed definition for the above grammar. 5

5. (a) Generate 3-Address code for the following : 5

```
switch (x + y)
{
    Case 1 : a = a + 1;
    Case 2 : b = b + 2;
    Case 3 : c = c + 3;
    default : d = d - 1;
}
```

(b) Obtain LR(d) items for the grammar

$A \rightarrow (A) \mid a.$ 5

(Turn Over)

6. (*a*) Construct a DAG for the expression

$$a + a * (b - c) + (b - c) * d$$

Show the steps clearly. 5

(*b*) Briefly explain main issues in code generation. 5

7. (*a*) Discuss briefly about the peephole optimization. 5

(*b*) Write about data flow analysis of structural programs. 5

8. (*a*) Discuss about function preserving transformation. 5

(*b*) Write a note on NEXT-USE information. 5

MCA-5
CD

Set-1

Full Marks : 70

Time : 3 hours

Answer **Q. No. 1** and any **five** from the rest

The figures in the right-hand margin indicate marks

1. Answer *all* questions : 2 × 10

(*a*) Define patterns, tokens and lexemes.

(*b*) Define derivations, give examples.

(*c*) What is handle pruning ?

(*d*) Mention two rules for type cheeking.

(*e*) Define basic blocks and flow graphs.

(*f*) Give the parse tree for the statement

$$a := b - c - d * 12.$$