

2015

MCA

4th SEMESTER EXAMINATION

COMPILER DESIGN

PAPER—MCA-403

Full Marks : 100

Time : 3 Hours

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

Illustrate the answers wherever necessary.

Answer Q. No. 1 and any four from the rest.

1. Answer any seven questions : 2×7

- (a) What does the link editor do?
- (b) What is a symbol Table?
- (c) What are the error recovery actions in a lexical analyzer?

(Turn Over)

- (d) What are tokens, pattern and lexemes ?
- (e) What is dead code elimination ?
- (f) What is Handle Pruning ?
- (g) What are the function of syntax analysis ?
- (h) What is LL(1) grammar ?
- (i) No left recursive grammar can be LL(1) — explain.
- (j) What is inherited attribute ?

2. (a) Consider the following Grammar :

$$S \rightarrow aS/Ab$$

$$A \rightarrow XYZ/\epsilon$$

$$X \rightarrow CS/\epsilon$$

$$Y \rightarrow dS/\epsilon$$

$$Z \rightarrow eS$$

Compute FIRST and Follow sets.

7

- (b) Show the predictive Parsing Table. Is this grammar LL(1) ? Show that if we add the production $X \rightarrow bS$ then the grammar is LL(1) or not ?

7

3. Construct the SLR Parsing table for the following grammar

$$S \rightarrow OSO / ISI / IO$$

- (a) Find the item sets of the above grammar. 7
- (b) Construct SLR Parsing Table. 7

4. Consider the following Grammar :

$$S \rightarrow CC$$

$$C \rightarrow aC$$

$$C \rightarrow d$$

- (a) Construct LR(1) item sets. 5
- (b) Construct CLR Parsing Table. 5
- (c) Parse the string "aadd". 4

5. Consider the following Grammar :

$$S \rightarrow CC$$

$$C \rightarrow aC$$

$$C \rightarrow d$$

- (a) Construct LALR Parsing Table. 7
- (b) Show the parsing method using LALR when taking input string "aadd". 7
6. (a) What is annotated parse tree? 3
- (b) What do you mean by syntax directed definition and Translation? Give one example. 8

- (c) What is dependency graph? 3
7. (a) Show the syntax tree for the expression if $m = n$ then $m = p + q$ else $n = p - q$. 3
- (b) Represent three address code
- $$x = (a + b)^* - c/d$$
- using quadruple, Triple and indirect Triple. 3+3+3
- (c) What is DAG? 2
8. Write short notes on (*any four*): $4 \times 3\frac{1}{2}$
- (a) Basic Block.
- (b) Flow graph.
- (c) Cross Compiler.
- (d) Common subexpression elimination.
- (e) NFA.
- (f) DFA.

Internal Assessment — 30
