

2008

COMPILER CONSTRUCTION

PAPER— 2403

*Full Marks : 70**Time : 3 hours*Answer any **five** questions*The figures in the right-hand margin indicate marks**Candidates are required to give their answers in their own words as far as practicable**Illustrate the answers wherever necessary*

1. (a) Consider the grammar

$$S \rightarrow (L) / a$$

$$L \rightarrow L, S / S$$

Find the parse trees for the following sentences :

$$(i) (a, (a, a))$$

$$(ii) (a, ((a, a), (a, a)))$$

(b) (i) What is left recursion?

(ii) Eliminate the left recursion for the above grammar.

(iii) What is left factoring? $(3 + 5) + (2 + 2 + 2)$

2. (a) What is ambiguous grammar? Test the following grammar w.r.t ambiguity:

$$S \rightarrow aB / ab$$

$$A \rightarrow aAB / a$$

$$B \rightarrow AB b / b.$$

(b) Briefly describe the different phases of compiler. What is a cross compiler.

$$(2 + 3) + (7 + 2)$$

3. Construct a predictive parsing table for the following grammar:

$$S \rightarrow ACB / CbB / Ba$$

$$A \rightarrow da / BC$$

$$B \rightarrow g / \epsilon$$

$$C \rightarrow h / \epsilon.$$

4. (a) Define LL(1) grammar. Is the following grammar LL(1)?

$$S \rightarrow aABbCD/\epsilon$$

$$A \rightarrow ASd/\epsilon$$

$$B \rightarrow SAChC/\epsilon$$

$$C \rightarrow Sf/Cg$$

$$D \rightarrow aBD/\epsilon$$

- (b) Critically comment on the design and usefulness of 'Top-down Parser'. (3+6)+5

5. Construct SLR(1) parsing table for the following grammar: 14

Stat \rightarrow if cond then Stat else Stat
 / if cond then Stat
 / all other production for statement

6. Is the following grammar LR(1)? If yes, construct a Canonical parsing table: 14

$$S \rightarrow aAd/bBd/aBe/bAe$$

$$A \rightarrow C$$

$$B \rightarrow C$$

7. Write short notes (any two):

7x2

(i) Basic block

(ii) Code optimization

(iii) Error handler

(iv) Intermediate code.
