2022

Computer Science

[P.G.]

(CBCS)

(M.Sc. Third Semester End Examination-2022)

PAPER-302

[Principle of Compiler]

Full Marks: 50   *Time: 02 Hrs*

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

A. Answer any FIVE questions of the following: 5x2= 10

i)   What is LL(I) Grammar?

ii) Define Annotated parse tree.

iii) Why LR parsing is good and attractive?

iv) What do you mean by left recursion?

v)   What is token?

vi) What is left factoring?

vii) What do you mean by back end of a compiler?

viii) Which phase of compiler will be able to detect the error when an operation with an incompatible operand is attempted?

B. Answer any FOUR questions of the following: 4x5 = 20

1. Construct LALR(I) parsers for the following grammer.

$S \rightarrow L = R$

$S \rightarrow R$

$L \rightarrow *R$

$L \rightarrow ID$

$R \rightarrow L$

2. Find the item sets for the following grammer using CVLR parsing method.

$S \rightarrow AS$

$S \rightarrow b$

$A \rightarrow SA$

$A \rightarrow a$

3. Construct a predictive parsing table for the following Grammar

$S \rightarrow iEtSS'|A$

$S \rightarrow eS / \varepsilon$

$E \rightarrow b$

4. Eliminate left recursion

$S -> Sab / SaS / X$

$X -> Xc / a / b$

5. Find the FIRST and FOLLOW of the following Grammar

$S -> ACB / CbB / Ba$

$A -> da / BC$

$B -> g / \varepsilon$

$C -> h / \varepsilon$

6. a) Compare among SLR, CLR and LALR parsing scheme.

   b) How to check grammar ambiguity? Give one example.

C. Answer any ONE question of the following: 1x10 = 10

7. Consider the following grammar

$S \rightarrow AS|b$

$A \rightarrow SA|a$

Construct the SLR parse table for the grammar. Show the actions of the parser of for the input string "ababab".

8. Write short note (any two)

   i) Three address code

   ii) Basic Block and Flow Graph

   iii) Code optimization

   iv) Cross Compiler   2x5=10

Internal Assessment :10