

Tribhuvan University
Institute of Science and Technology

2076



Bachelor Level / Third Year /Six Semester/Science
Computer Science and Information Technology-(CSc.352)
(Compiler Design and Construction)

Full Marks: 60
Pass Marks: 24
Time: 3 hours.

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

The questions are of equal value.

Attempt all questions.

(10x6=60)

1. Explain briefly about different phases involved in compiler, with a block diagram.
2. Given a regular expression $(\epsilon + 0)^*10$. Construct the DFA recognizing the pattern described by this regular expression using syntax tree based reduction.
3. What is shift reduce parsing techniques? Show shift reduce parsing action for the string $(x+x)^*a$, given the grammar

$$S \rightarrow S+S \mid S^*S \mid (S) \mid x$$
4. Construct SLR parsing table for the following grammar.

$$A \rightarrow aAa \mid bAb \mid ba$$
5. Define Syntax directed definition. Construct annotated parse tree for the input expression $(5*3+2)^*5$ according to the following syntax directed definition.

Production	Semantic Rule
$L \rightarrow En$	Print E.val
$E \rightarrow E_1+T$	$E.val = E_1.val + T.val$
$E \rightarrow T$	$E.val \rightarrow T.val$
$T \rightarrow T_1 * F$	$T.val \rightarrow T_1.val * F.val$
$T \rightarrow F$	$T.val \rightarrow F.val$
$F \rightarrow (E)$	$F.val \rightarrow (E.val)$
$F \rightarrow digit$	$F.val \rightarrow digit.lexval$

6. Write Syntax Directed Definition to carry out type checking for the following expression.

$$E \rightarrow id \mid E1 \text{ op } E2 \mid E1 \text{ relop } E2 \mid E1[E2] \mid E1^\uparrow$$
7. Explain with example about different methods of intermediate code representation.
8. What is the purpose of code optimization? Explain different types of loop optimization techniques with example.
9. Discuss about different factors affecting the process of target code generation.
10. Discuss the importance of error handler in compiler. How is it manipulated in the different phases of compilation?