Tribhuvan University
Institute of Science and Technology

2069

Bachelor Level/ First Year/ First Semester/ Science — Full Marks: 60
Computer Science and Information Technology (CSc. 352) — Pass Marks: 24
(Compiler Design and Construction)

Candidates are required to give their answers in their own words as for as practicable.
The figures in the margin indicate full marks.

Attempt All the Questions

1. What do you mean by compiler? Explain the semantic analysis phase of compiler construction.
2. Why are regular expressions used in token specification? Write the regular expression to specify the identifier like in C.
3. Discuss the specification of lexical analyzer generator Lex.
4. Consider the grammar :

   S - >Sbs | bsas | ε

   a) Show that this grammar is ambiguous by constructing two different leftmost derivations for sentence abab.
   b) Construct the corresponding rightmost derivations for abab.
   c) Construct the corresponding parse trees for abab.
5. Consider the grammar :

   E→E+T | T
   T→T*F|F
   F→ (E) | id

   a) Show steps of shift-reduce parsing for the input string id+id*id.
   b) Identify conflicts during the parsing
6. Describe the L-attributed definitions. How L-attributed definitions are evaluated?
7. Write the type expressions for the following types :
   a) An array of pointers to reals where the array index ranges from 1 to 100.
   b) Function whose domains are functions from two characters and whose range is a pointer of integer.
8. What do you mean by three address code? Write the syntax directed definition for following grammar to produce the three address codes for assignments
   a. >if = E
   b. >id
9. Discuss the issues in design of simple code generator.
10. Define the following optimization techniques :
    a.) Unreachable code elimination
    b.) Flow-of-control optimization