Karunya University
(Karunya Institute of Technology and Sciences)
(Declared as Deemed to be University under Sec.3 of the UGC Act, 1965)

End Semester Examinations - 2015-16 Even Semester - May 2016

14CS2038 Principles of Compiler Design

Set B

Time : 3 hrs
Total Marks: 100

1. a) Explain the phases of a compiler with a neat block diagram. (10)
   b) Write the translation of the statement result = num1 + num2 / 40 (10)

OR

2. a) Convert the following regular expression to DFA. (12)

   0(0|1)*101

   b) Explain the following functions in detail. (8)

   - nullable
   - firstpos
   - lastpos
   - followpos

3. Construct a Non – recursive predictive parsing table for the following grammar. (20)

   S --> aBDh

   B --> cC

   C --> bC | ϵ

   D --> EF

   E --> g | ϵ

   F --> f | ϵ

   Parse the string *acgfh* using the parsing table.

OR

4. Consider the Context Free Grammar

   S --> +SS | *SS | a

   with string +*aaa.

   a) (10)
      a. Give a left most derivation for the given string
      b. Give a right most derivation for the given string
      c. Give a parse tree for the string
      d. Check the ambiguity of the grammar.
      e. Describe the language generated by the grammar.

   Eliminate left recursion from the following grammar.

   b) (10)

   S --> a BCh

   B --> Bb | c

   C --> EF

   E --> g | ϵ

   F --> f | ϵ

5. Construct SLR parsing table for the following grammar.

S --> (L) | a

L --> L , S | S (20)

Parse the string *(a,a,a)* using the parsing table.

OR

6. Construct CLR parsing table for the following grammar.

S --> L = R

S --> R

L --> *R (20)

L --> id

R --> L

Parse the string **id=id* using the parsing table.

7. Construct the following intermediate representations for the expression

x = (a+b) – ((a+b)-e)

a) (14)
- Postfix notation
- Syntax tree
- DAG
- Three address code
- Quadruples
- Triples
- Indirect Triples

b) Write short note on inherited and synthesized attributes with example. (6)

OR

8. a) Briefly explain type checking with suitable example. (10)

Write semantic rules for the construction of syntax tree for the following grammar.

b) (10)

E --> E +T | E-T | T

T --> (E) | id | num

9. a) Describe in detail the issues in code generation. (10)

b) Explain in detail with suitable example the Peephole optimization. (10)

Wishing you All the Best
