Sixth Semester B.E. Degree Examination, Dec.2014/Jan.2015
Compiler Design

Time: 3 hrs.

Max. Marks:100

Note: *Answer any FIVE full questions, selecting*
atleast TWO questions from each part.

PART – A

1 a. List and explain various phases of the compiler. **(10 Marks)**
   b. Explain input buffering technique in lexical analyze. **(06 Marks)**
   c. Write transition diagram for the following: i) Multiline comments; ii) Identifier. **(04 Marks)**

2 a. Write recursive descent passes for the following grammar S → cAd A → ab/a. **(06 Marks)**
   b. Consider the following grammer:

   $$R \rightarrow R'|' R | R.R |(R) |R^* / a | b | c$$

   i)   Write unambiguous grammar for the above grammer. **(04 Marks)**
   ii) Find FIRST and Follow for the unambiguous grammar. **(06 Marks)**
   iii) Construct LL(1) parsing table. **(04 Marks)**

3 a. Write algorithm to find closure and go to function of LR(0) items. **(08 Marks)**
   b. Construct LR(0) passing table for the following grammar:
      $E \rightarrow E + T / T \qquad T \rightarrow TF \qquad F \rightarrow F * / a$
      Show the steps to process the input a * b + a. **(12 Marks)**

4 a. Distinguish between SLR, LALR and canonical LR parsers. **(05 Marks)**
   b. Write algorithm for construction of LALR parsing table. **(05 Marks)**
   c. Construct LR(1) parsing table for the following grammar:
      $S \rightarrow Aa / bAc / Bc / bBa \qquad A \rightarrow d \qquad B \rightarrow d$. **(10 Marks)**

PART – B

5 a. Explain synthesized and inherited attribute, with an example. **(06 Marks)**
   b. Write a SDD for construction of syntax tree during top down parsing and write dependency graph for the expression a – 4 + c. **(10 Marks)**
   c. Write SDD for a simple desk calculator. **(04 Marks)**

6 a. Write SDD to generate three address code for the flow of control statements. **(10 Marks)**
   b. Write quadruple, triple, three address code for   i) (a + b) * (a + b) – (a * b) * d. **(04 Marks)**
   c. What is the checking? Explain its different rules. **(06 Marks)**

7 a. What is activation record? Explain the structure of activation record with its fields. **(08 Marks)**
   b. Explain with diagram a variable length data on the stack. **(06 Marks)**
   c. Describe the locality of programmes in heap management with optimization strategies. **(06 Marks)**

8 a. Explain code generation algorithm and generate a code for the following expression:
       x = (a − b) + (a + c).   **(10 Marks)**
   b. Consider the following programme segment begin:
       Prod = 0
         i = 1
       do
       begin
       Prod = prod + A(i) * B(i)
         i++
       end
       while (i ≤ 20)
       end
       generate the intermediate code and identify basic blocks.   **(10 Marks)**

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