7E4239

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B.Tech. VII Semester (Main/Back) Examination - 2013

Computer Engg.

7CS3 Compiler Construction

Time : 3 Hours **Maximum Marks : 80**
Min. Passing Marks : 24

Instructions to Candidates:

*Attempt any **five** questions, selecting **one** question from each **unit**. All questions carry **equal** marks. (Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.)*

Unit - I

1. a) What are the different phases of compiler? Explain them with the help of suitable example. **(10)**

   b) Explain the following terms in brief.

   i. Input buffering.

   ii. Functions of lexical analyzer. **(3×2=6)**

OR

1. a) Consider context free grammar $S \rightarrow SS+|SS*|a$.

   i. Show how the string aa+a* can be generated by this grammar.

   ii. Construct a parse tree for this string.

   iii. What language is generated by this grammar? Justify your answer. **(8)**

   b) Construct minimum state DFA's for following regular expression.

   i. $(a|b)*a(a|b)$

   ii. $(a|b)*a(a|b)(a|b)$

   iii. $(a|b)*a(a|b)(a|b)(a|b)$ **(8)**

Unit - II

2. Consider the following grammar G:-

$E \rightarrow E+T \mid T$

$T \rightarrow TF \mid F$

$F \rightarrow F^* \mid a \mid b$

i. Construct the SLR parsing table for this grammar.

ii. Construct the LALR parsing table. **(8×2=16)**

OR

2. Write down a short note on following:

i. Operator precedence parser for regular expressions.

ii. Difference between bottoms up and top down parsing with suitable example.

iii. YACC error handling in LR parser.

iv. Context free grammar. **(4×4=16)**

Unit - III

3. a) Give a syntax-directed definition to translate infix expression into infix Expression without redundant parenthesis. For example, since + and * Associate to the left, ((a*(b+c))*(d)) can be rewritten as a*(b+c)*d. **(10)**

b) Write simplifications of a simple type checker with example. **(6)**

OR

3. Write a program to translate an infix expression into postfix form. Also writes Down syntax directed definition for the same. **(16)**

Unit - IV

4. a) Explain the various Runtime storage management techniques? Explain these with the help of suitable programming example. **(10)**

b) Explain the differences between stack allocation and heap allocation strategies. **(6)**

OR

4. Write a short note on (any two):

   i. Symbol table and Dangling References.

   ii. Activation Records and Parameter Passing.

   iii. Storage allocation strategies. **(8×2=16)**

Unit - V

5. a) Construct a DAG for the basic block whose code is given below:-

   D:=B*C
   E:=A+B
   B:=B*C
   A:=E-D **(10)**

   b) What is peephole optimization? Explain it. **(6)**

OR

5. a) Explain in brief the various issues of design of a code generator. **(8)**

   b) Explain the basic block and control flow graph. **(8)**