Compilers

P. Pages : 3

Time : Three Hours

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TKN/KS/16/7564

Max. Marks : 80

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Notes : 1. All questions carry marks as indicated.
2. Solve Question 1 OR Questions No. 2.
3. Solve Question 3 OR Questions No. 4.
4. Solve Question 5 OR Questions No. 6.
5. Solve Question 7 OR Questions No. 8.
6. Solve Question 9 OR Questions No. 10.
7. Solve Question 11 OR Questions No. 12.
8. Due credit will be given to neatness and adequate dimensions.
9. Assume suitable data whenever necessary.
10. Illustrate your answers whenever necessary with the help of neat sketches.

1. a) Explain the front end and back end of phases of compiler with examples. **7**

b) Describe cross compiler in details with example. **7**

OR

2. a) Write a short note on compiler writting tools LEX and YACC. **7**

b) Define the following terms: **7**
Compiler, Interpreter, Translator and Differentiate between them.

3. a) What is the significance of FIRST and FOLLOW in TOP-DOWN parser? **6**

b) Find the reduced grammar that is equivalent to CFG. **7**
$S \rightarrow aC \mid SB$

$A \rightarrow bSCc \mid a$

$B \rightarrow aSB \mid aBC$

$C \rightarrow aBC \mid ad$

OR

4. a) Compare the SLR, CLR & LALR parser. **6**

b) Construct the LL (1) parsing table for the following grammar: **7**
$S \rightarrow aBDh$

$B \rightarrow Bb \mid c$

$D \rightarrow EF$

$E \rightarrow g \mid \in$

$F \rightarrow f \mid \in$

5. a) Write the translation scheme for 'for' loop in C programming language. **5**

b) Convert the TAC for following code :- **8**
While (B > D and A < C) do
    if   (A > Z) then
        C = C + 1;
   else
        While (A < D) do
        A= A+Z;

OR

6. Draw anoted parse tree and three address code for the statement write SDTS for the same **13**
A[I, J, K] = B [I, C [K]] + C[I]
assume array A of size 10 x 20 x 30
        B of size 20 x 30
        C of size 30
and bpw = 4

7. a) What are function preserving transformation. **7**

b) What is dominators? How it is used to identify loop in three address code? Give example. **7**

OR

8. What is data flow equations? Solve the data flow equation for the following flow graph. **14**
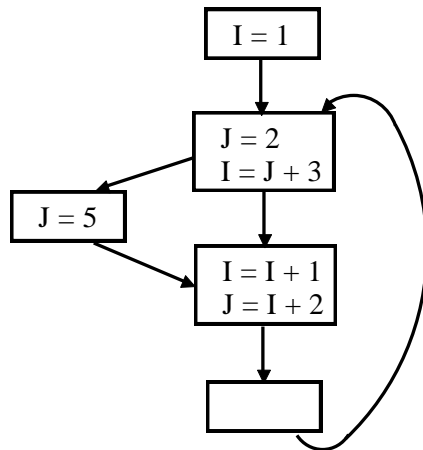
9. a) Discuss the characteristics of peephole optimization. **6**

b) Generate code for the following sequence of three address code statements using simple **7**
code generation algorithm.
$T_1 : A + B$
$T_2 : C + D$
$T_3 : E - T_2$
$T_4 : T_1 - T_3$

OR

10. a) Define a DAG. Draw the DAG for the following three address code.   **5**
d = b * c
e = a + b
b = b *c
a = e – d

    b) Write short notes on Register allocation and assignment.   **4**

    c) What are problems in code generation?   **4**

11. a) Explain the sequence of stack allocation processes for a function call.   **6**

    b) Describe various error handling techniques in LR parsers.   **7**

OR

12. a) What are the various attribute that should be stored in symbol table and discuss various data structure for implementation of symbol table.   **8**

    b) Explain the symbol table management for block structured language.   **5**

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