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_Sixth__ SEMESTER B.Tech [IT]

END SEMESTER EXAMINATION May-2019

IT-302 COMPILER DESIGN

Time: 3:00 Hours Max. Marks : 40

Note : Question 1 is mandatory
Answer any three questions from Q. 2 to Q. 5
Assume suitable missing data, if any.

Q.1 Answer the following with suitable justification:

a) Demonstrate a translation for the postfix notation for 2+(3*4)
[*SDD, Annotated Parse tree, evaluation at nodes*]

b) In the definition A→A+ {A.val=A.val+1}
A→E {print(id.lexval)}
the inherited attributes are.....and the synthesized attributes are..... (and why?)

c) An example of grammar that is LR but not LL(1) is .....*(with reason)*

d) What type of error (if any) is: for (x = 1; x< ; x++) and how and where will this error be detected?

e) Demonstrate a translation for Semantic analysis phase of compiler for a test string that involves multiplication of different types.
[*SDD, Annotated Parse tree, evaluation at nodes*]

(3+1+1+2+3)

Q.2 For the following grammar: S'→S$, S→Q=A, A→P-B, B→P+B, B→num, P→id, P→ϵ, Q→id

a) Construct the LR(0) automaton and the LR parsing table

b) Refer to LR parsing table and write the sequence of moves for the string: id = id - + id (7+3)

Q.3 For the following grammar S'→S$, S→Q=A, A→P-B, B→P+B, B→num, P→id, P→ϵ, Q→id

a) Construct the Syntax Directed Definition (SDD) for generating the 3-address code from the given grammar creating temporary variables where necessary.

b) Conduct a Syntax Directed Translation using the above SDD for the test string id = id + id + id

c) Store the translation output in a *Triple* storage structure. Analyze the drawbacks of this storage scheme.

(4+3+3)

Q.4. For the block of 3-address code given by

a=b+c

a=a+d

b=b+a

d=b+c

a) Construct the DAG and Conduct local optimization of the DAG assuming that only a and b are live on exit from the block.

b) Convert the optimized DAG into optimized 3-address code

c) Convert the optimized IR code into the target code (ALP)

(5+2+3)

Q.5 Explain in detail (any two)

a) Symbol Table entries and updation mechanism

b) An example of Error recovery techniques

c) Static versus Dynamic storage allocation & Stack versus Heap storage

(5+5)