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VI SEMESTER B.E.(COMPUTER SCIENCE AND ENGINEERING) DEGREE
END-SEMESTER EXAMINATION-MAY 2013
SUBJECT: LANGUAGE PROCESSORS (CSE 302)
DATE: 06-05-2013

TIME: 3 HOURS MAX.MARKS: 50

Instructions to Candidates

- **Note:** Answer any **FIVE** full questions.

1.A. Show how "position=initial +rate*60" is translated in different phases of Compilation.

1.B. Consider the grammar
S→**a**B | **a**C | S**d** | S**e**
B→**b**B**c** | **f**
C→**g**

(i) Is the grammar suitable for top down parsing? If not, transfer the same to a suitable form.
(ii) Compute the FIRST and FOLLOW sets.
(iii) Construct LL (1) parsing table.
(iv) Is the grammar LL (1)?

1.C. Give the algorithm for computing Closure of Itemsets.

(4+(1+1.5+1+0.5)+2)

2.A. What is the need for separating the analysis phase into lexical analysis and parsing? Explain.

2.B What is the drawback of having one input buffer scheme in Lexical Analysis? How is it overcome? Explain.

2.C. Using RETRACT function, give the transition diagram for accepting Unsigned numbers as per the Regular Expression given below.

digit → 0| 1|……|9
digits→digit digit*
optionalFraction→ **.** digits | ϵ
optionalExponent→ (E(+ | - | ϵ) digits) | ϵ
number→ digits optionalFraction optionalExponent

(3+4+3)

3.A. For the given grammar
P→P**a**Q | Q
Q→QR| R
R→R**b** | **c** | **d**
Construct LR (1) automaton.

3.B. Check if the given grammar is SLR (1) by filling the parse table entries.
S→AS | **b**
A→SA | **a**

(5+5)

4.A. What is attribute grammar? Explain the types of semantic attributes with an example for each.

4.B. t_1:= 4*i
t_2:= a[t_1]
t_3:= 4*i
t_4:= b[t_3]
t_5:= t_2 * t_4
t_6:= prod + t_5
prod:= t_6
t_7:= i + 1
i:= t_7
Give the assembly code for the above three address statements by assuming a and b to be arrays whose elements are 4-byte values.

4.C. Give the quadruple and triple notation for the three address code given in Q4.B.

(3+4+3)

5.A. Show the downward-growing stack of activation records for the following program.

```
int x,y
int gcd(int ,int v){
    if(v==0)
        return u;
     else
        return gcd (v,u%v);}
int main( ) {
       x=15;y=10;
      printf("%d", gcd(x,y));        return 0;}
```

5.B. With the help of neat diagram, explain the concept of multi pass translation in assemblers.

5.C. Discuss the principles which are helpful when designing calling sequences and the layout of activation records.

(3+4+3)

6.A. Give the algorithm for partitioning three address instructions into basic blocks. Draw the Flow Graph for the given Three Address Code.

1. t1=2*i
2. t2=a+t1
3. t3=2*i
4. t4=b=t3
5. t5=t2*t4
6. t6=p+t5
7. t7=i+1
8. i=t7
9. if i<=40 goto (1)

6.B. Give algorithm for LR-parsing program.

(6+4)

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