C V RAMAN GLOBAL UNIVERSITY, BBSR

REPEAT MID-SEM EXAM-2021

Subject: Compiler Design(CS30142) **Time: 90 Mins**
Semester: 6 th CSE **F.M-60**

1. Answer All **[2.5 x 8=20]**

a) Describe top down parsing.Mention different problems associated with top down parsing.

b) Consider the grammar G = ({ S,A}, {0,1}, P, S), where P is

S -> AS | 0

A -> SA | 1

Show that this Grammar is ambiguous.

. c) Mention the action of a top down parser when top of the stack is a terminal and non-terminal.

d) Consider Context Free Grammar:

S → abSa | aaAb

A → baAb | a

Check if the grammar is LL (1) or not?

e) Find the precedence and associativity of all the operators present in the following Grammar G:

S → T # P

T → T $ U

P → Q @ P

Q → id

U → id

f) Translate the expression a<b or c<d or e<f in three address code.

g) Mention the different forms of intermediate code for the statement (a + b) + (a + b + c)

h) Differentiate inherited and synthesized attributes used in Syntax Directed Translation.

2. Answer any four **[10 x 4 = 40]**

a. Consider the following context free grammar G:

S → (L)

S → a

L → L , S

L → S

Draw SLR parsing table for this grammar. Show the acceptability of the string (a,a,a) by using stack.

b. Consider the following context free grammar G:

S → L = R

S → R

L → * R

L → id
R → L

Find the CLR parsing table for this grammar.

c. Construct the predictive parsing table for the grammar:

P → P % Q | Q
Q → Q # R | R
R → id | (P).

Parse the string ***(id % id) # id***

d. Mention the need of Syntax Directed Translation in the process of designing a Compiler. Consider a CFG with semantic actions as given below:

S → S * A	{ S.val = S.val * A.val}
S → A	{S.val = A.val}
A → A + B	{A.val = A.val – B.val}
A →B	{A.val = B.val}
B →id	{B.val = id. lexval}

Draw the parse tree and annotated tree for the expression **6 + 5 + 1** and evaluate the SDT.

e. Compare L-attributed SDT with S-attributed SDT. Consider the following Grammar and their semantic rules:

S → aAA	{ print “REPEATMID”}
S → a | b	{print “SEM”}
A → Sbb	{print “EXAM”}

Find the output printed by the bottom up parser for the input string “**aabbabb**”.

f. Define three address code and different types of three address code? Mention the different ways a three address can be represented? Write three address code for the following program fragment

```
i = 1;
while ( i < 10 )
{
        y = i * 4 ;
        i = i + 1;
}
```