CD- Exam
End Sem

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S20180105 8
S20180010158
UG3 CSE

Set-2 Question 2

Q-1

(a) (iv) 10

(b) (i) + higher than *

~~(ii)~~ ^ higher than *

(c) (i) A-3, B-1, C-4, D-2

(d) (iv) LALR

(e) (ii) Statement is true

(f) (iv) All of above

Q-2

S → m * K
K → A + K
A → T - O | G + O
K → g + T
T → h
G → - N

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```
%{
    #include <stdio.h>
    #include <stdlib.h>
%}
=  {return ASSIGN}
\+ {return PLUS}
\* {return MUL}
-  {return MINUS}
[a-z] {return TERMINAL}
[A-Z] {return VARIABLE}
```

% token PLUS MINUS MUL TERMINAL

YACC

S ⇒ m * k

K ⇒ A

A = T MINUS 0 | G PLUS 0

K = G + T

T ⇒ h

G = MINUS N

$$ = $1 + $3

$$ = $1 + $3

$$ = $1 - $3

$$ = $1 - $3

$$ = $1

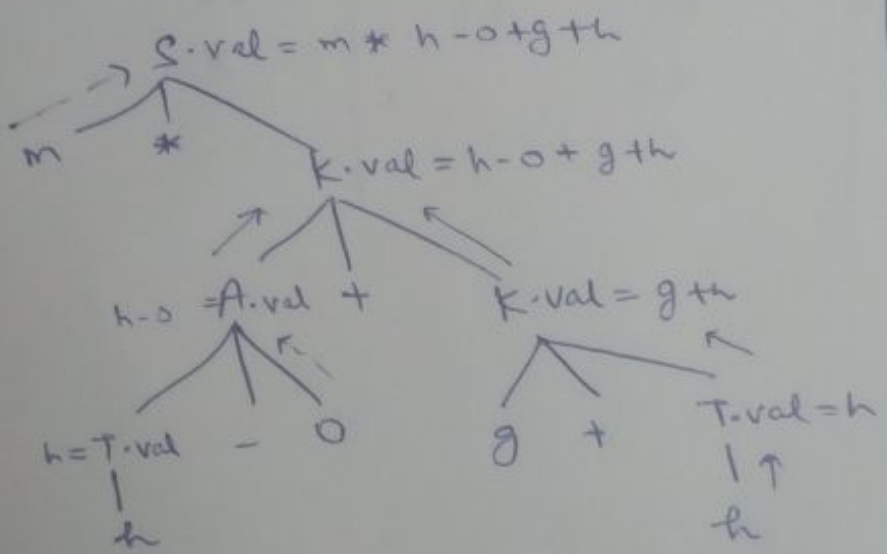
$$ = -$2

```
int main(){
    yyparse();
    return 0;
}
```

Q-3

$S \rightarrow m * K$	{S.value = m.lexval * K.value}
$K \rightarrow A + K$	{K.value = A.value + K.value}
$A \rightarrow T - 0 \mid G + 0$	{A.value = T.value - 0.lexval | G.val + 0.lexval}
$K \rightarrow g + T$	{K.value = g.lexval + T.value}
$T \rightarrow h$	{T.value = h.lexval}
$G \rightarrow - N$	{G.value = '-' N.value}

val = value attribute



Here '0' is terminal.

Q-4 $x=(a+b)*(-c+a+b)+d$

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Quadruple

Op	Arg 1	Arg 2	Result
+	a	b	t1
uminus	c		t2
+	t2	a	t3
+	t3	b	t4
*	t1	t4	t5
+	t5	d	t6
=	t6		x

Triple

#	Op	Arg 1	Arg 2
(0)	+	a	b
(1)	uminus	c	
(2)	+	(1)	a
(3)	+	(2)	b
(4)	*	(0)	(3)
(5)	+	(4)	d
(6)	=	x	(5)

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Q-5

line → line elc | sent
elc → word line | token
sent → (line) | and

⇒ eliminate left recursion

line → sent line'
line' → elc line' | ϵ
elc → word line | token
sent → (line) | and

	First
line	{(, and}
line'	{word, token, ϵ}
elc	{word, token}
sent	{(, and}

First (line') = First (elc line') + {ϵ}
= {word, token, ϵ}

First (line) = First (sent line') = {(, and}

Calculate Follow

	First	Follow
line → sent line'	(, and	word, token, $,)
line' → elc line' | ϵ	word, token, ϵ	word, token, $,)
elc → word line | token	word, token	word, token, $,)
sent → (line) | and	(, and	word, token, $,)

Closing brace

Assuming start symbol is line

follow(line) = follow (elc) + {)} + $
= First(line') + {)} + $
= word + token +) + $

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Q.6 $t = 5$

$t = a$

$t = x / 50$

$t = y - z$

Multiple statements

$u = b * c$

$v = a / u$

Answer

① LD R1, #50
ST t, R1

② LD R1, a
ST t, R1

③ LD R1, x
DIV R1, R1, #50

④ LD R1, y
LD R2, z
SUB R1, R1, R2

⑤ LD R1, B
LD R2, C
MUL R1, R1, R2
LD R3, a
DIV R3, R3, R1
ST V, R3