

Question 1

Part a

FIRST()

Symbol	FIRST() set
\$	\$
d	d
a	a
b	b
c	c
S	d, b, c, a,
A	a,
B	b, c
S'	d, b, c, a,

FOLLOW()

Symbol | FOLLOW() set —|— S' | \$ S | \$ A | d, a, \$ B | a, \$

Part B

FIRST()

Symbol	FIRST() set
a	a
b	b
c	c
S'	a
S	a
A	a, b
B	a,
C	b,
D	c,

FOLLOW()

Symbol | FOLLOW() set —|— S' | # S | a A | a,b,c B | a C | b,c D | c

Question 2

```
main(){

    get-token();

    call block();

    if(token!="$")
    {
        Error;
    }
    else{
        SUCCESS;
    }

}

block(){

    if(token != "begin")
    {
        throw_error();
    }
    else{
        get-token();
        call decls();
    }

}

decls(){

    while(token=="D"){
        get_token();
    }if(token == ";"){
        call decls();
    }else{
```

```

        if(token==""){
            get-token();
            call stmts();
        }else{
            throw_error();
        }
    }

}

stmts(){

    while(token!=";"){
        get_token();
        call statement();
    }
    if(token==""){
        get-token();
    }else{
        throw_error();
    }

}

statement(){
    if(token == "begin"){
        call stmts();
    }
    else if(token == "end"){
        get-token();
    }
    else if(token == "if"){
        get-token();

    }
    else if(token == "while"){
        get-token();

    }
    else if(token == "ass"){
        get-token();

    }
    else if(token == "scan"){
        get-token();

```

```

    }
    else if(token == "print"){
        get-token();

    }
    else if(token != "" || ";""){
        throw_error();
    }
}

```

Question 3

$S' \rightarrow S \$ 1$

$S \rightarrow iCSE 2 \mid a 3$

$E \rightarrow eS 4 \mid 5$

$C \rightarrow c 6$

Symbols	FIRST() set
S	i, a
E	e,
C	c
S'	i, a

Symbols	FOLLOW() set
S'	\$
S	e, \$
E	e, \$
C	i, a

VN\VT	i	a	e	c	\$
S'	1	1			
S	2	3			
E			4,5		5
C				6	

There is a conflict, this table is not LL(1)

b. $S \rightarrow iCSE \mid a$ becomes $S \rightarrow iCSEd \mid a$

VN\VT	i	a	e	c	d	\$
S'	1	1				
S	2	3				
E			4		5	
C				6		