Infix to Postfix:-

Infix Expression : $A*(B*C+D*E)+F:$

S.NO	current token	operator stack	postfix string
1.	A	infinity	A
2.	*	*	A
3.	(	*(	A
4.	B	*(	AB
5.	*	*(*	AB
6.	(	*(*	ABC
7.	+	*(+	ABC*
8.	D	*(+	ABC*D
9.	*	*(+*	ABC*D
10.	E	*(+*	ABC*DE
11.	)	*	ABC*DE+
12.	+	+	ABC*DE*+*
13.	F	+	ABC*DE*+*F
14.	.	.	ABC*DE*+*F+

Postfix Expression is :- ABC*DE*+*F+
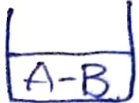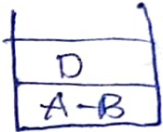
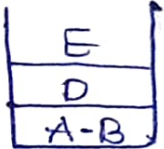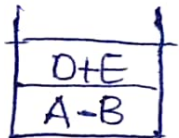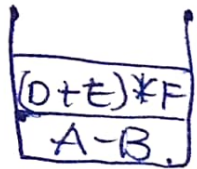2) Infix Expression : A*B^c+D

S.NO	current token	operator stack	postfix string
1	A		A
2	*	*	A
3	B	*	AB
4	A	*A	AB
5	C	*A	ABC
6	+	+	ABC^*
7	D	+	ABC^*D
8		+	ABC^*D+

Postfix Expression : ABC^*D+

3) postfix to infix :-

Postfix Expression : AB-DE +F*/

S.No	Reading of postfix	stack top	Expression
1.	A	A	$\boxed{A}$
2.	B	B	$\boxed{\begin{array}{c} B \\ A \end{array}}$
3.	-	A-B	$\boxed{A-B}$
4.	D	D	$\boxed{\begin{array}{c} D \\ A-B \end{array}}$
5.	E	E	$\boxed{\begin{array}{c} E \\ D \\ A-B \end{array}}$
6.	+	D+E	$\boxed{\begin{array}{c} D+E \\ A-B \end{array}}$
7.	F	F	$\boxed{\begin{array}{c} F \\ D+E \\ A-B \end{array}}$
8.	*	$((D+E)*F)$	$\boxed{\begin{array}{c} (D+E)*F \\ A-B \end{array}}$
9.	/	$(A-B)/((D+E*F))$	

Infix Expression: $(A-B)/((D+E)*F))$

4)i Postfix conversion : abc*de - /+

S.NO	symbol	stack
1.	a	a
2.	b	ab
3.	c	abc
4.	*	a(b*c)
5.	d	a(b*c)d
6.	e	a(b*c)de
7.	-	a(b*c)(d-e)
8.	/	a((b*c)/(d-e))
9.	+	(a+((b*c)/(d-e)))

Infix conversion : (a+((b*c)/(d-e)))

5) Balanced Symbol:-

$$((a+b)*(c-d))$$

S.NO	symbol	stack	Action Taken	Expression so far
1	(	(	Push '('	(
2.	(	((	Push '('	((
3.	a	((	Append 'a'	((a
4.	+	((	Append '+'	((a+
5.	b	((	Append 'b'	((a+b
6.	)	(	POP '('	((a+b
7.	*	(*	Push '*'	((a+b)*
8.	(	(*(	Push '('	((a+b)*(
9.	(	(*C	Append '('	((a+b)*C
10	-	(*(	Append '-'	((a+b)*(c-
11.	d	(* C	Append 'd'	((a+b)*(c-d)
12.	)	(*	pop 'c'	((a+b)*(c-d)
13	)		pop 'c'	((a+b)*(c-d)

It is valid for 'Balanced symbol.'

6) i) $[\{(a+b)^* c\} - d]$

S. NO	Symbol	Stack	Action taken	Expression so far
1.	(	[(]	push '('	(
2.	a	[(]	Append 'a'	(a
3.	+	[(,+]	push '+'	(a+
4.	b	[(,+]	Append 'b'	(a+b
5.	)	[(,+]	pop '('	(a+b)
6.	*	[(,+*]	push '*'	(a+b)*
7.	c	[(,*]	Append 'c'	(a+b)*c
8.	)	[(]	pop 'c'	(a+b)*c
9.	-	[(,-]	push '-'	(a+b)*c
10.	d	[c, -]	Append 'd'	(a+b)*c-d
11.	End	∅	pop remaining operators	(a+b)*c-d

It is valid for "Balanced symbol"