

① Infix to Postfix.

Infix expression:  $A^*B^1C + D$

S.No	Current token	Operator stack	Postfix
1.	A		A
2.	*	[ * ]	A
3.	B	[ * ]	AB.
4.	^	[ * ]	AB
5.	C	[ * ]	ABC
6.	+	[ * ]	ABC^*
7.	D	[ * ]	ABC^*D

Postfix expression:  $ABC^*D +$

② Infix to Postfix.

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

S.No	Current token	Operator stack	Postfix
1.	A	-	A
2.	*	*	A
3.	(	* (	A

4.	B	* (	AB	6.	+
5.	*	* ( *	AB	7.	F
6.	C	* ( +	ABC	8.	X
7.	+	* ( +	ABC *	9.	I
8.	D	* ( + *	ABC * D		In-
9.	*	* ( + *	ABC * D		
10.	E	* ( + *	ABC * DE *	4.	Pos
11.	)	*	ABC * DE * +	SNO:-	1.
12.	+	+	ABC * DE * + *		2.
13.	F	+ ,	ABC * DE * + * F +		3.

Postfix expression: ABC \* DE \* + \* F +

3. Postfix to infix:

S.NO	Reading of postfix	Stack top	Expression
1.	A	A	A
2.	B	B	B
3.	-	A-B	A-B
4.	D	D	D
5.	E	E	E

6. + D+E

$$\boxed{D+E}$$
$$\boxed{A-B}$$

7. F F

$$\boxed{F}$$
$$\boxed{D+E}$$
$$\boxed{A-B}$$

8. \*  $((D+E)^*F)$

$$\boxed{(D+E)^*F}$$
$$\boxed{A-B}$$

9. /  $(A-B)/(D+E^*F)$

$$\boxed{(D+E)^*F}$$
$$\boxed{A-B}$$

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

4. Postfix to infix: abc<sup>\*</sup>de - / +

<u>SNO:-</u>	<u>Symbol</u>	<u>Stack</u>
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 symbols:-

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

S.No	Symbol	Stack	Action taken	expression so far	S.No
1.	(	(	Push 'c'	(	1.
2.	(	((	Push 'c'	((	2.
3.	a	((	Append 'a'	((a	3.
4.	+	((	Append '+'	((a+	4.
5.	b	((	Append 'b'	((a+b	5.
6.	)	(	POP 'c'	((a+b	6.
7.	*	(*	Push '*'	((a+b)*	7.
8.	(	(*()	Push '('	((a+b)*()	8.
9.	c	(*()	Append 'c'	((a+b)*()c	9.
10.	-	(*()	Append '-'	((a+b)*()c-	10.
11.	d	(*()	Append 'd'	((a+b)*()c-d	11.
12.	)	(*	POP 'c'	((a+b)*()c)	12.
13.	)		POP 'c'	((a+b)*()c))	13.

It is valid for balanced symbol

6. Balancing symbols:-  $[d(a+b)^*c] - d]$

S.No	Symbol	Stack	Action taken	expression so far.
1.	[	[c]	Push 'c'	[
2.	a	[c]	APPend 'a'	(a
3.	+	[c,+]	push '+'	(a +
4.	b	[c,+]	APPend 'b'	(a+b
5.	)	[c,+]	POP 'c'	(a+b)
6.	*	[c,+,*]	push '*'	(a+b)*
7.	(	[c,*]	APPend 'c)	(a+b)* c
8.	)	[c]	POP 'c'	(a+b)* c
9.	-	[c,-]	POP '-c'	(a+b)* c -
10.	d	[c,-]	APPend 'd'	(a+b)* c - d
11.	End	∅	POP remaining operations	(a+b)* c - d

If it is valid for balanced symbol