

QUESTION 1

i) $A + ((B - C * D) / E) + F - G / H$ (PREFIX)

$H / G - F +) E /) D * C - B ((+ A$

<u>CHAR</u>	<u>STACK</u>	<u>PREFIX</u>
H		H
/	/	H
G	/	H G
-	-	H G /
F	-	H G / F
+	- +	H G / F
)	- +)	H G / F
E	- +)	H G / F E
/	- +) /	H G / F E
)	- +) /)	H G / F E
D	- +) /)	H G / F E D
*	- +) /) *	H G / F E D
C	- +) /) *	H G / F E D C
-	- +) /) -	H G / F E D C *
B	- +) /) -	H G / F E D C * B
(	- + ) /	H G / F E D C * B -
(	- +	H G / F E D C * B - /
+	- + +	H G / F E D C * B - /
A	- + +	H G / F E D C * B - / A

FINALY PREFIX EXPRESSION : $- + + A / - B * C D E F / G H$

- + + A / - B * C D E F / G H = - + + 5 / - 7 * 1 2 1 6 / 3 1

<u>CHAR</u>	<u>ACTION</u>	<u>STACK</u>
1	Push 1	1
3	Push 3	1 3
/	Push 3/1	3
6	Push 6	3 6
1	Push 1	3 6 1
2	Push 2	3 6 1 2
1	Push 1	3 6 1 2 1
*	Push 1 * 2	3 6 1 2
7	Push 7	3 6 1 2 7
-	Push 7 - 2	3 6 1 5
/	Push 5 / 1	3 6 5
5	Push 5	3 6 5 5
+	Push 5 + 5	3 6 10
+	Push 10 + 6	3 16
-	Push 16 - 3	13

SUM : 13

i) $A + ((B - C * D) / E) + F - G / H$ (POSTFIX)

<u>CHAR</u>	<u>STACK</u>	<u>POSTFIX</u>
A		A
+	+	A
(	+ (	A
(	+ ( (	A
B	+ ( (	A B
-	+ ((-	A B
C	+ ((-	A B C
*	+ ((- *	A B C
D	+ ((- *	A B C D
)	+ (	A B C D * -
/	+ (/	A B C D * -
E	+ (/	A B C D * - E
)	+	A B C D * - E /
+	+	A B C D * - E / +
F	+	A B C D * - E / + F
-	-	A B C D * - E / + F +
G	-	A B C D * - E / + F + G
/	- /	A B C D * - E / + F + G
H	- /	A B C D * - E / + F + G H

FINALY POSTFIX EXPRESSION: $A B C D * - E / + F + G H / -$

A B C D * - E / + F + G H / - = 5 7 1 2 * - 1 / + 6 + 3 1 / -

<u>CHAR</u>	<u>ACTION</u>	<u>STACK</u>
5	Push 5	5
7	Push 7	5 7
1	Push 1	5 7 1
2	Push 2	5 7 1 2
*	Push 2 * 1	5 7 2
-	Push 7 - 2	5 5
1	Push 1	5 5 1
/	Push 5 / 1	5 5
+	Push 5 + 5	10
6	Push 6	10 6
+	Push 10 + 6	16
3	Push 3	16 3
1	Push 1	16 3 1
/	Push 3 / 1	16 3
-	Push 16 - 3	13

SUM : 13

ii) ! (A && ! ((B < C) || (C > D))) || (C < E) (PREFIX)

) E < C (||))) D > C (||) C < B ((! && A (!

<u>CHAR</u>	<u>STACK</u>	<u>PREFIX</u>
))	
E	)	E
<	) <	E
C	) <	E C
(		E C <
||	||	E C <
)	||)	E C <
)	||))	E C <
)	||)))	E C <
D	||)))	E C < D
>	||))) >	E C < D
C	||))) >	E C < D C
(	||))	E C < D C >
||	||)) ||	E C < D C >
)	||)) ||)	E C < D C >
C	||)) ||)	E C < D C > C
<	||)) ||) <	E C < D C > C
B	||)) ||) <	E C < D C > C B
(	||)) ||	E C < D C > C B <
(	||)	E C < D C > C B < ||
!	||) !	E C < D C > C B < ||
&&	||) &&	E C < D C > C B < || !
A	||) &&	E C < D C > C B < || ! A
(	||	E C < D C > C B < || ! A &&
!	|| !	E C < D C > C B < || ! A &&

FINALY PREFIX EXPRESSION: || ! && A ! || < B C > C D < C E

|| ! && 1 ! || < 0 1 > 1 0 < 1 1

<u>CHAR</u>	<u>ACTION</u>	<u>STACK</u>
1	Push 1	1
1	Push 1	1 1
<	Push 1 < 1	0
0	Push 0	0 0
1	Push 1	0 0 1
>	Push 1 > 0	0 1
1	Push 1	0 1 1
0	Push 0	0 1 1 0
<	Push 0 < 1	0 1 1
||	Push 1 || 1	0 1
!	Push !1	0 0
1	Push 1	0 0 1
&&	Push 1 && 0	0 0
!	Push !0	0 1
||	Push 1 || 0	1

SUM : 1

ii) ! (A && ! ((B<C) || (C>D))) || (C<E) (POSTFIX)

<u>CHAR</u>	<u>STACK</u>	<u>POSTFIX</u>
!	!	
(! (
A	! (	A
&&	! (&&	A
!	! (&& !	A
(	! ( && ! (	A
(	! ( && ! ( (	A
B	! ( && ! ( (	A B
<	! (&& ! ((<	A B
C	! (&& ! ((<	A B C
)	! ( && ! (	A B C <
||	! ( && ! ( ||	A B C <
(	! ( && ! ( || (	A B C <
C	! ( && ! ( || (	A B C < C
>	! ( && ! ( || ( >	A B C < C
D	! ( && ! ( || ( >	A B C < C D
)	! ( && ! ( ||	A B C < C D >
)	! (&& !	A B C < C D > ||
)	!	A B C < C D > || ! &&
||	||	A B C < C D > || ! && !
(	|| (	A B C < C D > || ! && !
C	|| (	A B C < C D > || ! && ! C
<	|| ( <	A B C < C D > || ! && ! C
E	|| ( <	A B C < C D > || ! && ! C E
)	||	A B C < C D > || ! && ! C E <

FINALY POSTFIX EXPRESSION: A B C < C D > || ! && ! C E < ||

1 0 1 < 1 0 > || ! && ! 1 1 < ||

<u>CHAR</u>	<u>ACTION</u>	<u>STACK</u>
1	PUSH 1	1
0	PUSH 0	1 0
1	PUSH 1	1 0 1
<	PUSH 0 < 1	1 1
1	PUSH 1	1 1 1
0	PUSH 0	1 1 1 0
>	PUSH 1 > 0	1 1 1
||	PUSH 1 || 1	1 1
!	PUSH !1	1 0
&&	PUSH 1 && 0	0
!	PUSH !0	1
1	PUSH 1	1 1
1	PUSH 1	1 1 1
<	PUSH 1< 1	1 0
||	PUSH 1 || 0	1

SUM : 1