

Q1 i) **$A + ((B - C * D) / E) + F - G / H$**

$$2 + ((4 - 2 * 1) / 2) + 5 - 6 / 3$$

Postfix : **$A B C D * - E / F G H / - + +$**

$$2 \ 4 \ 2 \ 1 \ * \ - \ 2 \ / \ 5 \ 6 \ 3 \ / \ - \ + \ +$$

$$\underbrace{2 \ 4 \ 2 \ 1}_{2} \ * \ - \ 2 \ / \ 5 \ 6 \ 3 \ / \ - \ + \ +$$

$$2 \ 4 \ 2 \ - \ 2 \ / \ 5 \ 6 \ 3 \ / \ - \ + \ +$$

$$\underbrace{2 \ 4 \ 2}_{2} \ - \ 2 \ / \ 5 \ 6 \ 3 \ / \ - \ + \ +$$

$$2 \ 2 \ 2 \ / \ 5 \ 6 \ 3 \ / \ - \ + \ +$$

$$\underbrace{2 \ 2 \ 2}_{1} \ / \ 5 \ 6 \ 3 \ / \ - \ + \ +$$

$$2 \ 1 \ 5 \ 6 \ 3 \ / \ - \ + \ +$$

$$\underbrace{5 \ 6 \ 3}_{2} \ / \ - \ + \ +$$

$$2 \ 1 \ 5 \ 2 \ - \ + \ +$$

$$\underbrace{5 \ 2}_{3} \ - \ + \ +$$

$$2 \ 1 \ 3 \ + \ +$$

$$\underbrace{1 \ 3}_{4} \ + \ +$$

$$2 \ 4 \ +$$

$$\underbrace{2 \ 4}_{6} \ + = 6$$

Prefix : **$- + + A / - B * C D E F / G H$**

$$- \ + \ + \ 2 \ / \ - \ 4 \ * \ 2 \ 1 \ 2 \ 5 \ / \ 6 \ 3$$

$$\underbrace{2 \ 1 \ 2 \ 5}_{2}$$

$$- \ + \ + \ 2 \ / \ - \ 4 \ * \ 2 \ 1 \ 2 \ 5 \ 2$$

$$\underbrace{2 \ 1 \ 2 \ 5}_{2}$$

$$\begin{array}{r}
 - + + 2 / - 4 2 2 5 / 6 3 \\
 \underbrace{\hspace{1.5cm}} \\
 2 \\
 - + + 2 / 2 2 5 2 \\
 \underbrace{\hspace{1.5cm}} \\
 1 \\
 - + + 2 1 5 2 \\
 \underbrace{\hspace{1.5cm}} \\
 3 \\
 - + 3 5 2 \\
 \underbrace{\hspace{1.5cm}} \\
 8 \\
 - 8 2 \\
 \underbrace{\hspace{1.5cm}} \\
 6 = 6
 \end{array}$$

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

$$!(1 \&\& !((0 < 1) || (1 > 1))) || (1 < 0) = 1$$

Postfix : $A B C < C D > || ! \&\& ! C E < ||$

$$\begin{array}{r}
 1 0 1 < 1 1 > || ! \&\& ! 1 0 < || \\
 \underbrace{\hspace{1.5cm}} \\
 1
 \end{array}$$

$$\begin{array}{r}
 1 1 1 1 > || ! \&\& ! 1 0 < || \\
 \underbrace{\hspace{1.5cm}} \\
 0
 \end{array}$$

$$\begin{array}{r}
 1 1 0 || ! \&\& ! 1 0 < || \\
 \underbrace{\hspace{1.5cm}} \\
 1
 \end{array}$$

$$\begin{array}{r}
 1 1 ! \&\& ! 1 0 < || \\
 \underbrace{\hspace{1.5cm}} \\
 0
 \end{array}$$

$$\begin{array}{r}
 1 0 \&\& ! 1 0 < || \\
 \underbrace{\hspace{1.5cm}} \\
 0
 \end{array}$$

$$\begin{array}{r}
 0 ! 1 0 < || \\
 \underbrace{\hspace{1.5cm}} \\
 1
 \end{array}$$

1 1 0 < ||
0

1 0 ||
1 = 1

Prefix : || ! & & A ! || < B C > C D < C E

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

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

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

|| ! & & 1 ! || 1 0 0
1

|| ! & & 1 ! 1 0
0

|| ! & & 1 0 0
0

|| ! 0 0
1

|| 1 0
1 = 1