FAQs

1. Write the expression for critical depth of neutral axis.

$$\sigma_{cbc} / \sigma_{st}/m = x_c / d\text{-}x_c$$

2. Write the expression for actual depth of neutral axis when $x \leq D_f$

$$b_f\, x.x/2 + (1.5m\text{-}1)\, A_{sc}\, (x\text{-}d^1) = m\, A_{st}(d\text{-}x)$$

3. Give the expression for moment of resistance for flanged section when $x \leq D_f$

$$Mr = C\ X\ z = b_f\, x\, \sigma_{cbc}/2\ (d\text{-}x/3) + (1.5m\text{-}1)\, A_{sc}\sigma_{cbc}\,{}^1(d\text{-}d^1)$$

5. Moment of resistance of doubly reinforced flanged beam: **case (i) when $x \leq D_f$**

   To find x_c

$$\sigma_{cbc} / \sigma_{st}/m = x_c / d\text{-}x_c$$

   To find x

$$b_f\, x.x/2 + (1.5m\text{-}1)\, A_{sc}\, (x\text{-}d^1) = m\, A_{st}(d\text{-}x)$$

   To find M_r

$$Mr = C\ X\ z = b_f\, x\, \sigma_{cbc}/2\ (d\text{-}x/3) + (1.5m\text{-}1)\, A_{sc}\sigma_{cbc}\,{}^1(d\text{-}d^1)$$

6. Moment of resistance of singly reinforced flanged beam: **case (ii) when $x > D_f$**

   To find x_c

$$\sigma_{cbc} / \sigma_{st}/m = x_c / d\text{-}x_c$$

   To find x

$$b_f D_f(x\text{-}D_f/2) + b_w(x\text{-}D_f)(x\text{-}D_f/2) + (1.5m\text{-}1)\, A_{sc}\, (x\text{-}d^1) = mA_{st}(d\text{-}x)$$

   The moment of area of the web portion in compression is too small as compared to the flange portion and is generally neglected. Hence,

$$b_f D_f(x\text{-}D_f/2) + (1.5m\text{-}1)\, A_{sc}\, (x\text{-}d^1) = mA_{st}(d\text{-}x)$$

   To find M_r

$$M = C\ X\ z = b_f D_f\, (\sigma_{cbc}+\sigma_{cbc}{}^{11})/2\ (d\text{-}Y) + (1.5m\text{-}1)\, A_{sc}\sigma_{cbc}\,{}^1(d\text{-}d^1)$$