UNIVERSITY OF WOLLONGONG IN DUBAI

Relevant Formulae (After Topics 1&2&3&4)

$\rho = \frac{nA}{V_C N_A}$ Avogadro number $\mathbf{N_A}$ = 6.022 × 10^{23} atoms/mol	$APF = \frac{Volume\ of\ atoms\ in\ a\ unit\ cell}{Volume\ of\ unit\ cell}$
$\frac{N_V}{N} = exp^{\left(-\frac{Q_V}{kT}\right)}$ Boltzmann's constant k_B= 8.62x10^{-5} eV/K = 1.38x 10^{-23} J/atom-K	$N_s = \rho\left(\frac{N_A}{A}\right)$ Avogadro number $\mathbf{N_A}$ = 6.022 × 10^{23} atoms/mol
$E = \frac{\sigma}{\varepsilon}$	$\sigma = \frac{F}{A}$
$\varepsilon = \frac{\Delta l}{l}$	$\delta = \frac{FL^3}{48EI}$ I=second moment of area (this will be provided in the question)
Strain hardening (cold work) $\%CW = \frac{A_o - A_f}{A_o} \times 100$	Hall-Petch Equation (grain boundary reduction) $\sigma_y = \sigma_0 + k_y d^{-0.5}$
	$K_{IC} = Y\sigma\sqrt{\pi a}$
$\Delta\sigma_{\sigma_m} = \Delta\sigma_{\sigma_0}\left(1 - \frac{\sigma_m}{\sigma_{TS}}\right)$	$\Delta\sigma = \sigma_{max} - \sigma_{min}$ $\sigma_a = \frac{\Delta\sigma}{2}$ $\sigma_m = \frac{\sigma_{max} + \sigma_{min}}{2}$
1 N/m^2 = 1 Pa 1 N/mm^2 = 1 MPa	1mm = 0.001m