[Manufacturing Science & Technology - I] ASSIGNMENT [FORGING]

Que-1 :- In a forging operation the initial and final diameter of blank is 200mm and 400mm. Height is 60mm. Find true strain.

[Ans: $\epsilon = 1.38$]

Que-2:- A circular disc of 150mm diam^{er} and 10mm height is compressed b/w the dies. Determine sticking radius and total load on dies. Assume $\mu = 0.2$. Tensile yield strength to be 210 MPa.

[$r_s = 48.5$mm, $F = 10134.1$ KN ~~6115.9 KN~~]

Que-3: A cylinder of height 60mm and diam^{er} 100mm is forged at room Temp^{re} b/w two flat dies. Find the die load at end of compression to a height of 30mm. Using slab Method to analysis. The yield strength of work material is given as 120 N/mm^2 and $\mu = 0.05$. Assume volume is constant after forging. There is no sticking. Also find mean die pressure.

[Ans: $F = 2.04$MN, $P_a = 130$MPa]

Que-4: A circular disc of 200mm diam^{er} and 70mm height is forged to 40mm height. If the flows curve equation of material is given by $\sigma_y = 200(0.01+\epsilon)^{0.41}$ MPa & co-efficient of friction is 0.05. Determine forging load, mean die pressure and max. pressure.

[Ans: 9.771MN, 177.74MP & 220.91 MPa]

Que-5: A cylindrical specimen made up of steel is 150mm in diam^{er} and 100mm high. It is upsetted by open die forging to a height of 50mm. Assume that $\mu = 0.2$. Calculate force required to forge the material. If flow curve is $\sigma_y = 1030\epsilon^{0.17}$.

[Ans:- 46.26 MN]

Que-6: A circular disc of 200mm diam^{er} if 100mm thick is compressed b/w two dies to a thickness of 50mm. Determine max. die pressure if $\mu = 0.1$ and Yield strength in compression is 230MPa.

[$P_{max} = 404.95$ MPa]