

Solution and Marking Scheme

Q.1	a	Figure Derivation	02 04
	b	Proving ϕ is a valid stress function $\sigma_x = \frac{B}{3} x$ $\sigma_y = 0$ $\tau_{xy} = A + \frac{B}{3} y$	02 02
		OR	
Q.2		Expression for stresses. $\sigma_r = -6 \text{ N/mm}^2$ at $r = 100 \text{ mm}$ $\sigma_\theta = 15.6 \text{ N/mm}^2$ at $r = 100 \text{ mm}$ $\sigma_r = 0 \text{ N/mm}^2$ at $r = 150 \text{ mm}$ $\sigma_\theta = 9.6 \text{ N/mm}^2$ at $r = 150 \text{ mm}$	06 04
Q.3	a	Isoclinic Isochromatic in details	02 02
	b	$\epsilon_1 = 104.4$ $\epsilon_2 = -544.4$ $\gamma_{Max} = 324.4$ $\phi_1 = 20^\circ$ $\sigma_1 = -11.048 \text{ MPa}$ $\sigma_2 = -124.982 \text{ MPa}$ $\tau_{Max} = 25.24 \text{ MPa}$	01 01 01 01 01 01
		OR	
Q.4	a	Figure Explanation	02 02
	b	$\epsilon_1 = 351.25$ $\epsilon_2 = 35.75$ $\gamma_{Max} = 315.5$ $\phi_1 = -27^\circ$ and -117° $\sigma_1 = 28.28 \text{ MPa}$ $\sigma_2 = 11.553 \text{ MPa}$ $\tau_{Max} = 8.365 \text{ MPa}$	01 01 01 01 01 01