

ESE GATE PSUs

State Engg. Exams

MADE EASY
WORKBOOK 2025



**Detailed Explanations of
Try Yourself *Questions***

Civil Engineering

Soil Mechanics
& Foundation Engineering



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Stress Distribution in Soils



Detailed Explanation of Try Yourself Questions

T1 : Solution

We know that,

$$\sigma_z = \frac{3Q}{2\pi z^2} \times \frac{1}{[1+(r/z)^2]^{5/2}}$$

Point P, $r/z = 0$

$$\sigma_z = \frac{3 \times 2000}{2\pi(6)^2} \times \frac{1}{[1+0]^{5/2}} = 26.53 \text{ kN/m}^2$$

Point R, $r/z = 5/6$

$$\sigma_z = \frac{3 \times 2000}{2\pi(6)^2} \times \frac{1}{[1+(5/6)^2]^{5/2}} = 7.1 \text{ kN/m}^2$$

T2 : Solution

We know that

$$\sigma_z = \frac{2q}{\pi z} \left[\frac{1}{1+(x/z)^2} \right]^2$$

At point P,

$$\sigma_z = \frac{2 \times 120}{\pi \times 3.5} \left[\frac{1}{1+(2/3.5)^2} \right]^2 = 12.40 \text{ kN/m}^2$$



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Soil Exploration



Detailed Explanation of Try Yourself Questions

T1 : Solution

The depth of the boundary between the two strata can be given by

$$D = \frac{d}{2} \sqrt{\frac{V_2 - V_1}{V_2 + V_1}} = \frac{30}{2} \sqrt{\frac{4000 - 600}{4000 + 600}} = 12.9 \text{ m}$$

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