**Assignment Sheet 2**

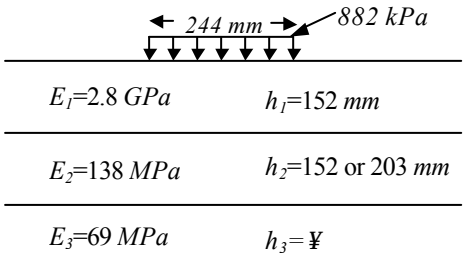
1. A circular load with a radius of 152 mm and a uniform pressure of 552 kPa is applied on a two-layer system. The subgrade has a elastic modulus of 35 MPa and can support a maximum vertical stress of 55 kPa. If the AC has an elastic modulus of 3,45 GPa what is the required thickness of a full depth AC pavement? If a thin surface treatment is applied on a granular base with elastic modulus 173 MPa, what is the thickness of base course required?

2. A total load of 89 kN was applied on the surface of a two layer system through a rigid plate 305 mm in diameter. Layer 1 has a thickness of 203 mm and layer 2 has an elastic modulus of 44.2 MPa. Both layers are incompressible with a poisson ratio of 0.5. If the deflection of the plate is 2.54 mm, determine the elastic modulus of layer 1.

3. A set of dual tyres, each having a contact radius of 115 mm and a contact pressure of 483 kPa is applied on a two layer system. The centre to centre spacing of dual is 343 mm. Layer 1 has a thickness of 152 mm and an elastic modulus of 690 MPa and layer 2 has an elastic modulus of 69 MPa. Determine the vertical deflection at point A, which is on the interface beneath the centre of one loaded area.

4. A circular load with a radius of 152 mm and a uniform pressure of 55 kPa is applied on a pavement of 304 mm thick having an elastic modulus of 345 MPa. The subgrade has an elastic modulus of 69 MPa. Calculate the interface deflection and the deflection that takes place with in the pavement layer.

5. For the layered system shown in the figure, determine the radial strain at the bottom of layer 1. If $h_2$ = 203 mm what is the radial strain at the bottom of layer 1? Use Pettis charts and check the value with the one obtained from Jones tables.




6. A circular load with a radius of 122 mm and a uniform pressure of 828 kPa is applied on a three layer system as shown in figure. Given $h_1$= 152 mm, $h_2$ = 152 mm, $E_1$= 2.8 GPa, $E_2$= 138 MPa and $E_3$= 69 MPa, determine all the stresses and strains at the two interfaces on the axis of symmetry.