



### SECTION-B

2. Discuss the design process and sources of design data.
3. Write the design procedure for bushed-pin type flexible coupling.
4. Sketch two views of a knuckle joint and write the equations showing the strength of joint for the most probable modes of failure.
5. Draw bolt deformation diagram and explain.
6. Determine the maximum, minimum and average pressure in a plate clutch when the axial force is 4 kN. The inside radius of the contact surface is 50 mm and the outside radius is 100 mm. Assume uniform wear.

### SECTION-C

7. Determine the dimensions of a rectangular sunk key made up of mild steel for a 80 mm diameter mild steel shaft to transmit a torque of 135 N-m. Assume shear stress = 50 N/mm<sup>2</sup> and crushing stress = 120 N/mm<sup>2</sup>.
8. Write down the design procedure for longitudinal and transverse fillet weld.
9. Fig. 1 shows the arrangement of two brake shoes which act on the internal surface of a cylindrical brake drum. The braking force  $F_1$  and  $F_2$  are applied as shown and each shoe pivots on its fulcrum  $O_1$  and  $O_2$ . The width of the brake lining is 35 mm. The intensity of pressure at any point A is  $0.4 \sin \theta$  N/mm<sup>2</sup>, where  $\theta$  is measured as shown from either pivot. The coefficient of friction is 0.4. Determine the braking torque and the magnitude of the forces  $F_1$  and  $F_2$ .

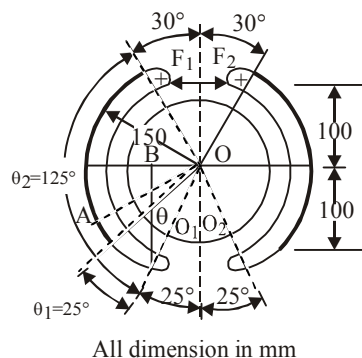


Fig.1