2 **(a)** Define the *moment* of a force.

.....

.....[1]

(b) A thin disc of radius r is supported at its centre O by a pin. The disc is supported so that it is vertical. Three forces act in the plane of the disc, as shown in Fig. 2.1.

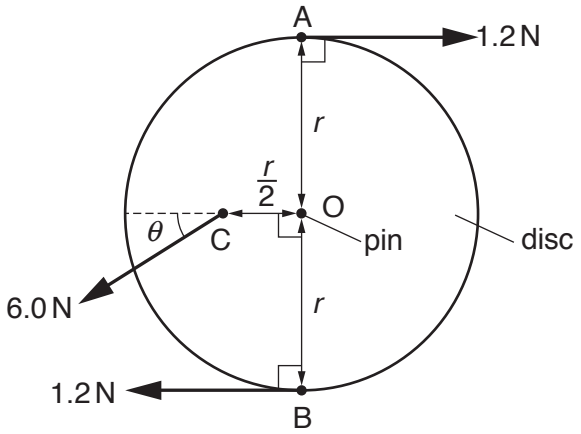

Fig. 2.1

Two horizontal and opposite forces, each of magnitude 1.2 N, act at points A and B on the edge of the disc. A force of 6.0 N, at an angle θ below the horizontal, acts on the midpoint C of a radial line of the disc, as shown in Fig. 2.1. The disc has negligible weight and is in equilibrium.

(i) State an expression, in terms of r, for the torque of the couple due to the forces at A and B acting on the disc.

.....[1]

(ii) Friction between the disc and the pin is negligible.
Determine the angle θ.

θ = ... ° [2]

(iii) State the magnitude of the force of the pin on the disc.

force = ... N [1]

[Total: 5]