

- 4 (a) Define the *torque* of a couple.

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 [2]

- (b) A wheel is supported by a pin P at its centre of gravity, as shown in Fig. 4.1.

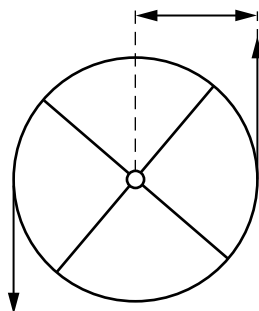


Fig. 4.1

The plane of the wheel is vertical. The wheel has radius 25 cm.
 Two parallel forces each of 35 N act on the edge of the wheel in the vertical directions shown in Fig. 4.1. Friction between the pin and the wheel is negligible.

- (i) List two other forces that act on the wheel. State the direction of these forces and where they act.

1.
 2. [2]

- (ii) Calculate the torque of the couple acting on the wheel.

torque = Nm [2]

- (iii) The resultant force on the wheel is zero. Explain, by reference to the four forces acting on the wheel, how it is possible that the resultant force is zero.

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 [1]

- (iv) State and explain whether the wheel is in equilibrium.

..... [1]