3 **(a)** Define the term *angular velocity*.

....

....[1]

(b) A 10 kg baggage is left on a rotating baggage carousel at an airport as shown in Fig. 3.1.

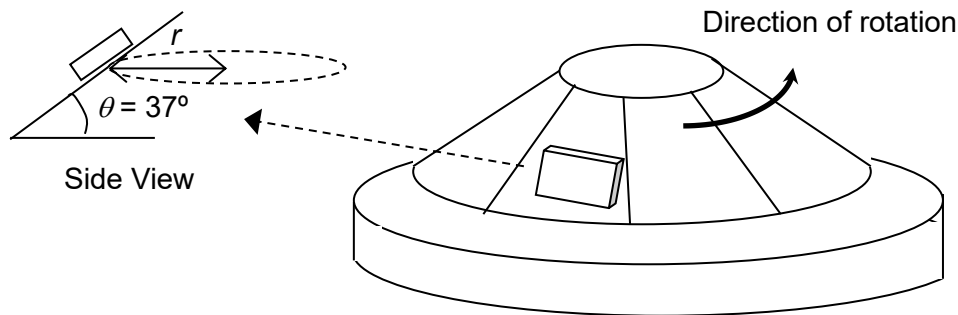Direction of rotation

$\theta = 37^\circ$

Side View

Fig. 3.1

The baggage stays at a fixed position on the slope of the carousel and rotates about in a circle of radius 10 m. The angle θ that the slanted surface makes with the horizontal is 37°. The frictional force acting on the baggage is 60 N. The baggage is moving in uniform circular motion.

(i) Explain, using Newton's law(s) of motion, why the baggage will experience a net force towards the centre of the circle.

....

....

....

....[2]

(ii) Considering the forces acting on the baggage, show that the normal contact force is 78 N.

[2]

(iii) Calculate the time required for the baggage to complete one full rotation.

time = ... s [3]

[Total: 8]