1 Fig. 1.1 shows a horizontal turntable.

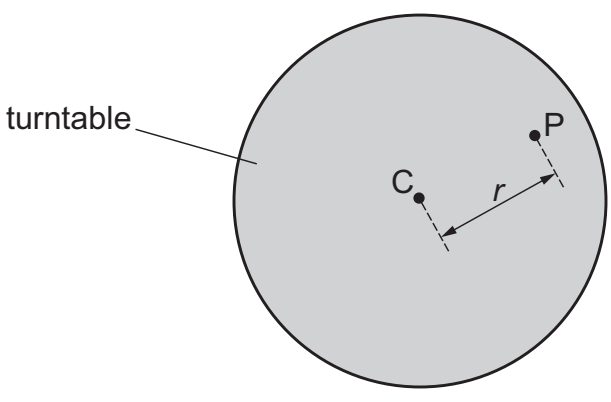

Fig. 1.1

Point C is at the centre of the turntable. Point P is a distance *r* from the centre.

Fig. 1.2 shows a side view of a d.c. motor attached to the turntable with a belt.

Fig. 1.2

The motor is used to rotate the turntable at frequency f_0. The motor is switched off and the turntable continues to rotate at frequency f_0.

A sphere of adhesive putty of mass *m* is dropped onto the turntable at point P. The frequency of the turntable is now *f*.

It is suggested that *f* is related to *m* by the relationship

$$\frac{Kf_0}{f} = \beta K + mr^2$$

where β and *K* are constants.

Plan a laboratory experiment to test the relationship between *f* and *m*.

Draw a diagram showing the arrangement of your equipment.

Explain how the results could be used to determine values for β and *K*.

In your plan you should include:

- the procedure to be followed
- the measurements to be taken
- the control of variables
- the analysis of the data
- any safety precautions to be taken.

Diagram

..... [15]