1 **(a)** Define *acceleration*.

……..……

……...……... [1]

(b) A ball of mass 400 g is thrown with an initial velocity of 30.0 m s^{-1} at an angle of 40.0° to the horizontal, as shown in Fig. 1.1.

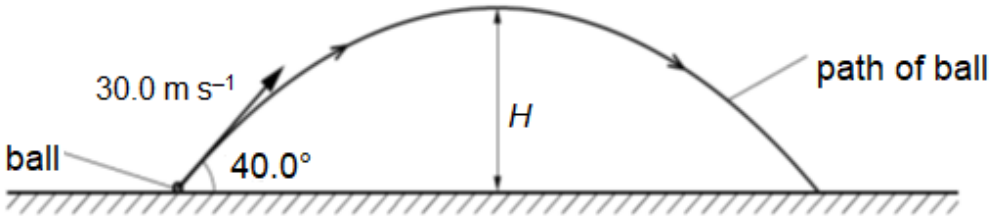

Fig. 1.1 (not to scale)

Air resistance is negligible. The ball reaches a maximum height *H* after a time of 1.97 s.

(i) Calculate

1. the initial kinetic energy of the ball,

[2]

kinetic energy = ……..…… J

2. the maximum height *H* of the ball,

[2]

H = …..…….…….. m

3. the gravitational potential energy of the ball at height *H*.

[1]

potential energy = …….…….…….. J

(ii) **1.** Determine the kinetic energy of the ball at its maximum height.

[1]

kinetic energy = ……. J

2. Explain why the kinetic energy of the ball at the maximum height is not zero.

……..……

[1]

……..……

(iii) Determine the maximum horizontal distance travelled by the ball.

[2]

horizontal distance = ……. m