1 **(a)** Define acceleration.

.....

..... [1]

(b) In an experiment, two objects A and B are released from the side of a building, as shown in Fig. 1.1.

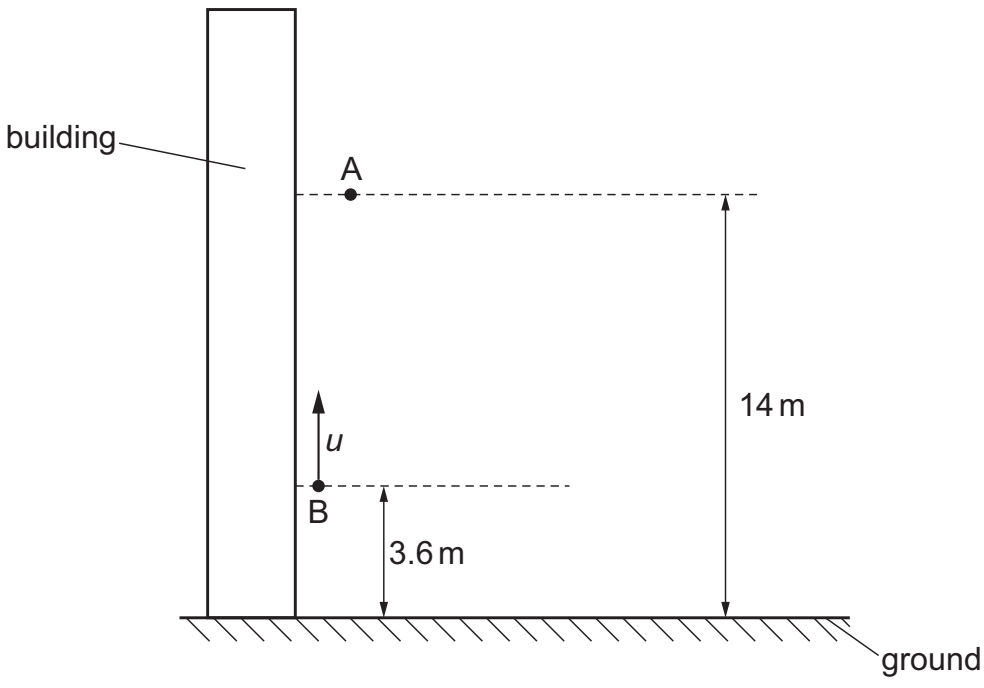

Fig. 1.1 (not to scale)

Object A is released from rest at a height of 14 m above the horizontal ground.
Object B is released with an initial upwards vertical velocity u at a height of 3.6 m above the ground.
Both objects take the same time to reach the ground and they do not collide with each other.
Air resistance is negligible.

(i) Calculate the time taken for object A to reach the ground.

time = ... s [2]

(ii) Use your answer in **(b)(i)** to calculate u.

u = ... $m\,s^{-1}$ [2]

(c) In a second experiment, object B is released from the same height and given the same initial speed as in **(b)** but at a release angle θ to the vertical, as shown in Fig. 1.2.

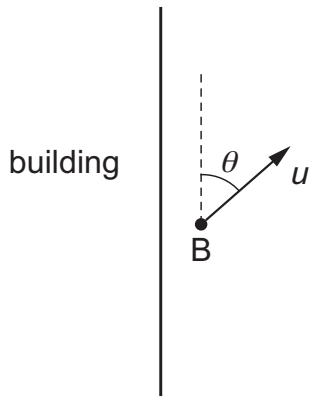

Fig. 1.2

(i) State and explain whether the time taken for object B to reach the ground is less than, the same as or greater than the time in **(b)(i)**.

.....

.....

..... [2]

(ii) By considering energy, state and explain the effect of the change in release angle on the speed at which B reaches the ground.

.....

.....

..... [2]

[Total: 9]