

2 (a) State an example of how the motion of an object can be undergoing the following situations:

- (i) a body in equilibrium is not at rest,

.....
..... [2]

- (ii) a body is instantaneously at rest but has a non-zero acceleration,

.....
..... [1]

- (iii) a body is moving with a constant speed but has a non-zero acceleration.

.....
..... [2]

- (b)** A toy car, initially at rest, can be made to propel forward by attaching a bottle filled with baking soda and vinegar. When the bottle cap is removed, the gas released from the reaction will cause the toy car to move forward. Fig. 2.1 shows how the acceleration, a , of the toy car changes with time t .

$$a / \text{m s}^{-2}$$

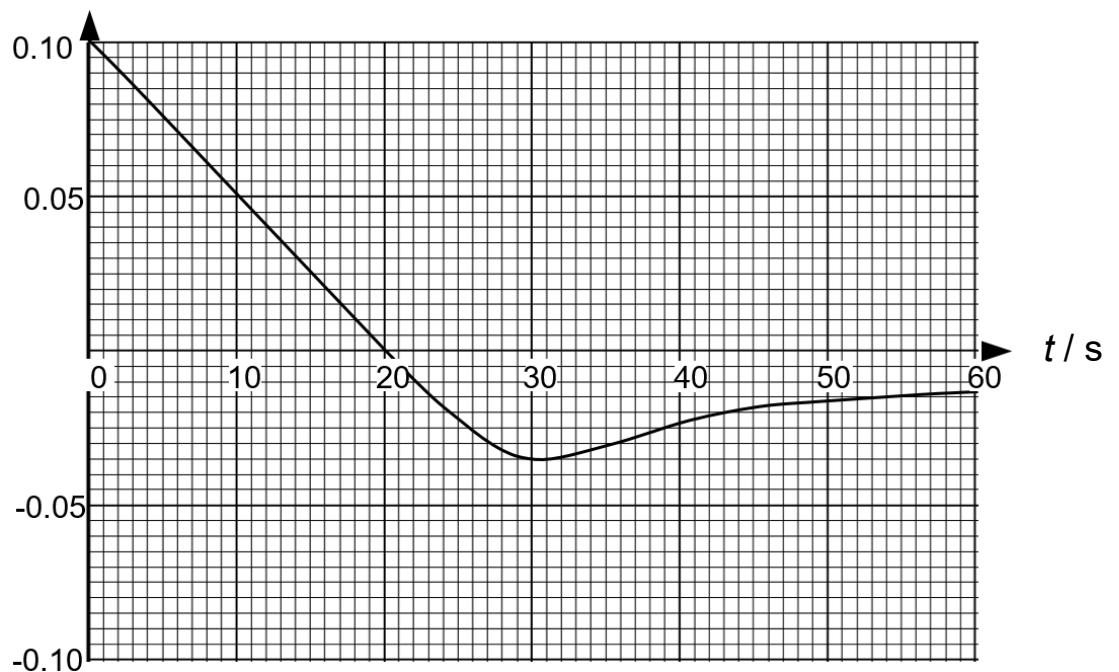
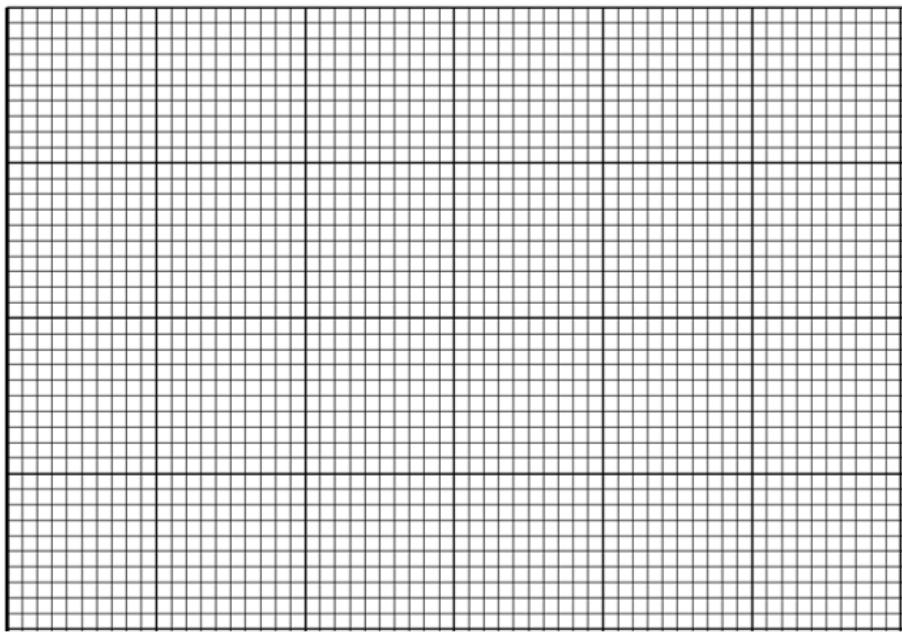


Fig. 2.1

- (i) With reference to Fig. 2.1, determine the maximum speed of the toy car.

$$\text{maximum speed} = \dots \text{ m s}^{-1} \quad [2]$$

- (ii) Hence, sketch a graph on Fig. 2.2 to show how the velocity, v , of the toy car changes with time t from $t = 0.0\text{ s}$ to $t = 40.0\text{ s}$.



[3]

Fig 2.2

[Total: 10]

