

Name of the Student: _____

Max. Marks : 19 Marks

Time : 19 Minutes

Q1.

Figure 10a shows a box falling towards a hard floor.

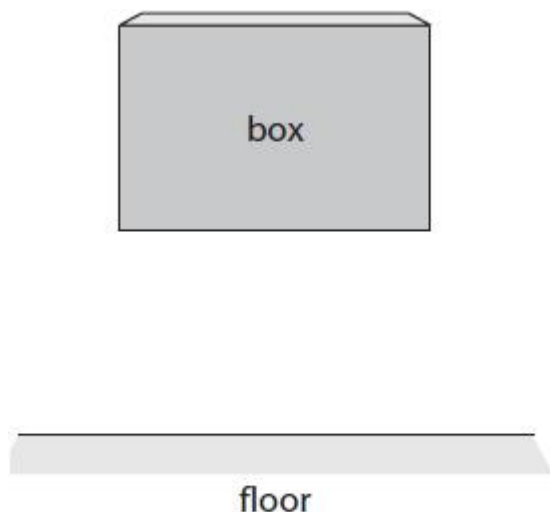


Figure 10a

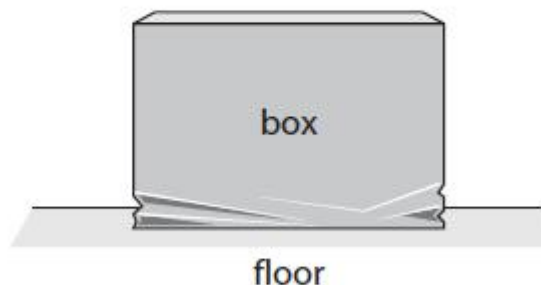


Figure 10b

The box hits the floor and crumples a little before it comes to rest as shown in Figure 10b.

The momentum of the box just before it hits the floor is 8.7 kg m/s .

The box comes to rest 0.35 s after it first hits the floor.

(i) Calculate the magnitude of the force exerted by the floor on the box.

Use an equation selected from the list of equations at the end of this paper.

(2)

force exerted by the floor on the box = ... N

(ii) State the magnitude and direction of the force exerted by the box on the floor.

(2)

magnitude

direction

Q2.

Figure 8 shows two ice skaters during a performance.



Figure 8

- (i) The two ice skaters are travelling together in a straight line at 3.50 m/s.
Their total momentum is 371 kgm/s.
The man has a mass of 64.5 kg.
Calculate the mass of the woman.

(4)

mass = ... kg

- (ii) Calculate the kinetic energy of the man.

(2)

kinetic energy = ... J

(Total for question = 6 marks)

Q3.

Figure 5 is a velocity/time graph for a lift moving upwards in a tall building.

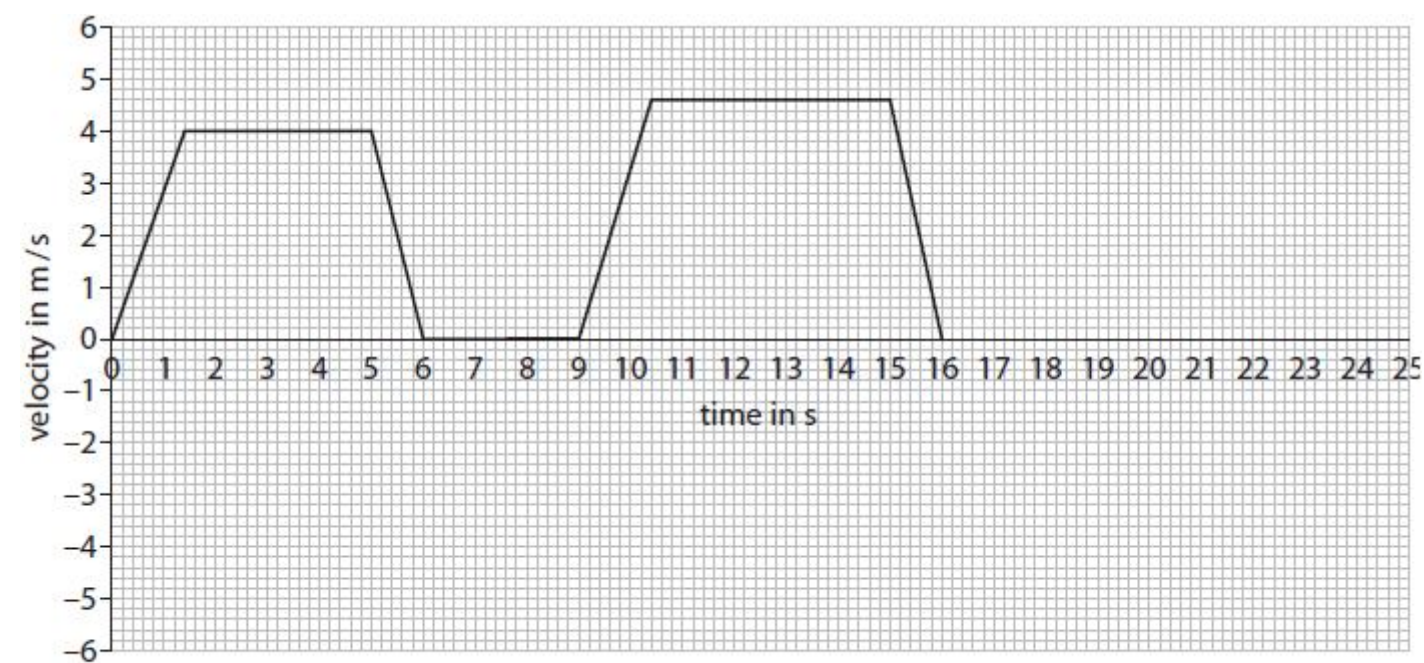


Figure 5

Use the graph in Figure 5 to determine the acceleration of the lift during the first 1.4 s.

(3)

acceleration = ... m/s²

(Total for question = 3 marks)

Q4.

Figure 7 is a velocity/time graph showing a 34 s part of a train's journey.

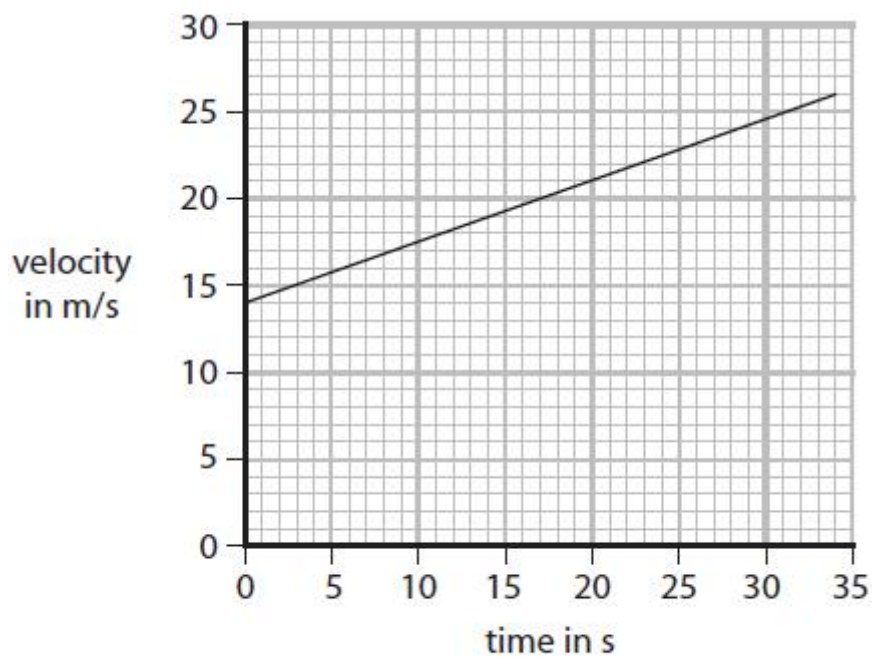


Figure 7

- (i) Calculate the acceleration of the train in the 34 s.

Give your answer to an appropriate number of significant figures.

(3)

acceleration = ... m/s^2

- (ii) Calculate the distance the train travels in the 34 s.

(3)

distance m

(Total for question = 6 marks)