Name of the Student:_____

Max. Marks : 17 Marks **Time : 17 Minutes**

Q1.

Figure 5 shows a racket and a tennis ball.

The tennis ball is travelling towards the racket at a velocity of 8.2 m/s.

The ball is hit back in the opposite direction at a velocity of 15 m/s.

The ball has a mass of 0.075 kg.

The ball is in contact with the racket for 12 ms.

(i) Calculate the average force exerted by the ball on the racket.

Use the equation

$$F = \frac{mv - mu}{t}$$

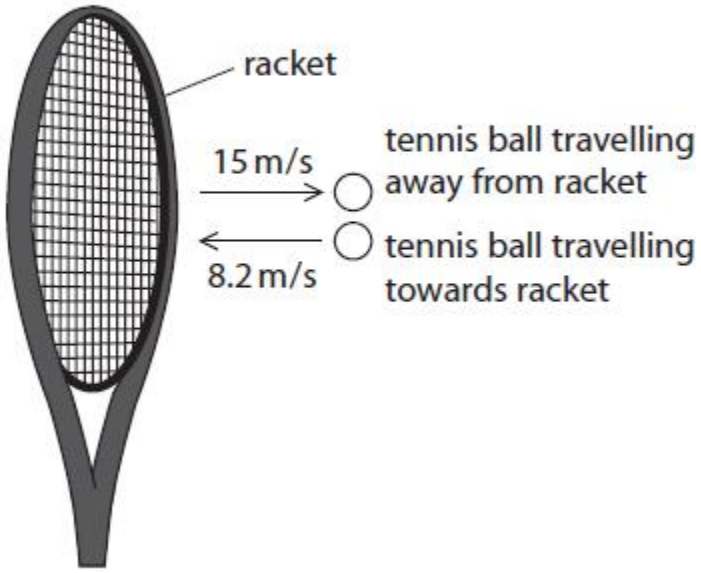


Figure 5

(3)

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force = ... N

(ii) Describe how Newton's Third Law of Motion applies to the collision between the racket and the ball.

(2)

.....

.....

.....

.....

(Total for question = 5 marks)

Q2.

Figure 9 shows a skier on a slope.

The skier travels down the slope with a constant acceleration.

The speed of the skier is measured at points P and Q.

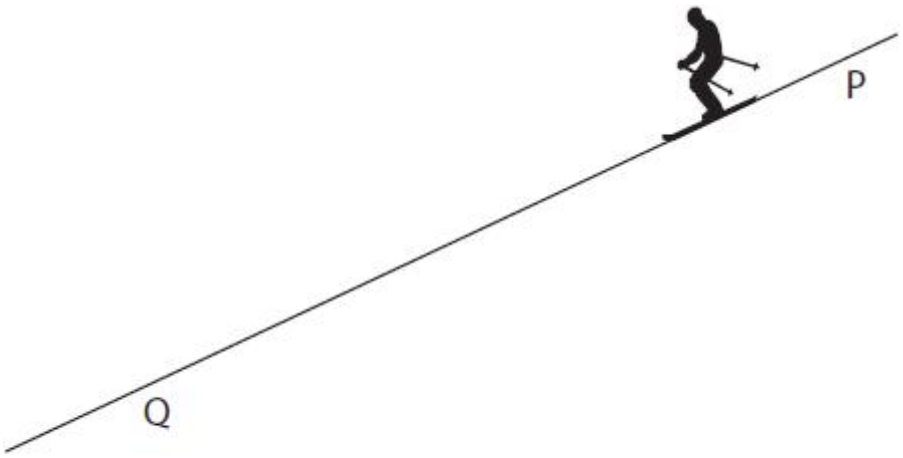


Figure 9

The table in Figure 10 gives some data about the skier making one downhill run.

acceleration	3.0 m/s^2
speed at P	7.6 m/s
speed at Q	24 m/s

Figure 10

(i) Calculate the distance from P to Q.

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

(3)

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distance from P to Q = ... m

(ii) Calculate the time taken for the skier to travel from P to Q.

(3)

time from P to Q =..... s

(Total for question = 6 marks)

Q3.

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

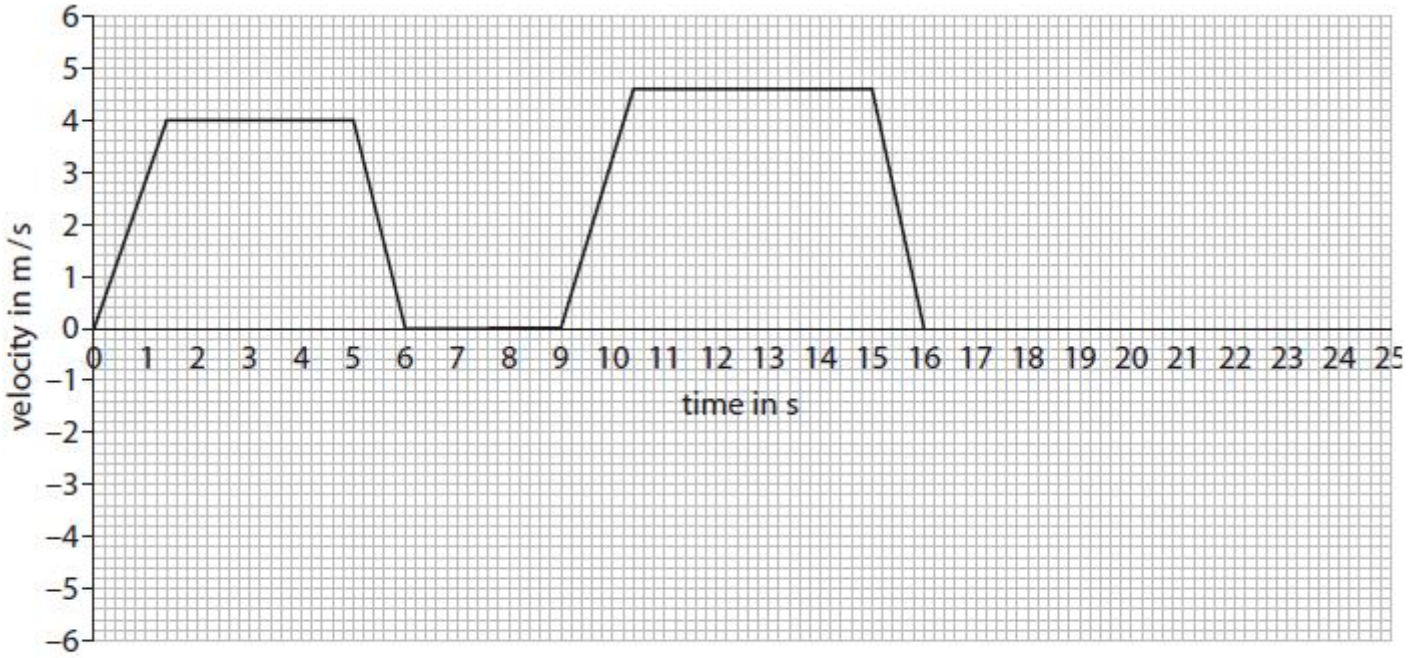


Figure 5

Use the graph in Figure 5 to determine the distance that the lift travelled during the first 6.0 s.

(3)

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distance = ... m

(Total for question = 3 marks)

Q4.

Figure 11 shows a ball before and after it collides with a wall.

The arrows show the direction of movement of the ball.

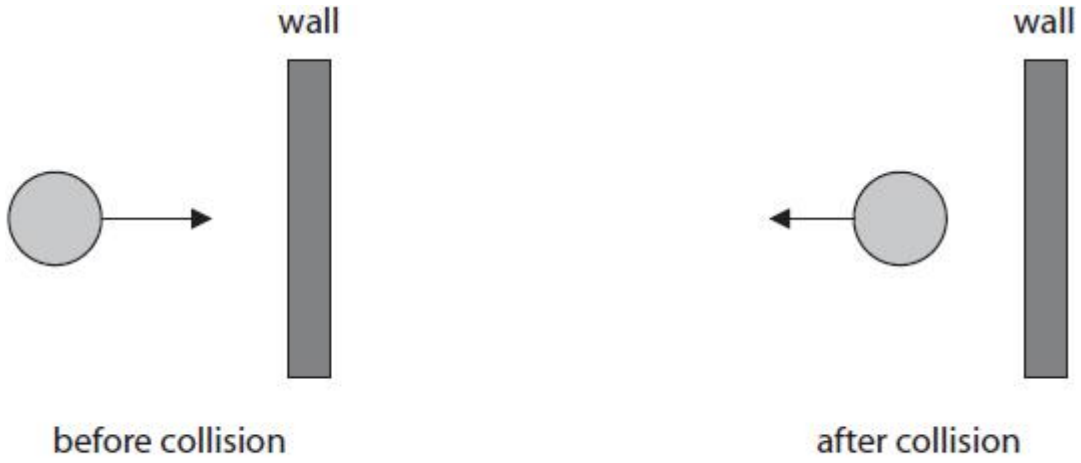


Figure 11

Before the collision, the momentum of the ball is 0.80 kg m / s.

After the collision, the momentum of the ball is 0.60 kg m / s in the opposite direction.

The ball is in contact with the wall for a time of 70 ms during the collision.

Calculate the force exerted on the ball by the wall.

(3)

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

force = ... N

(Total for question = 3 marks)

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