

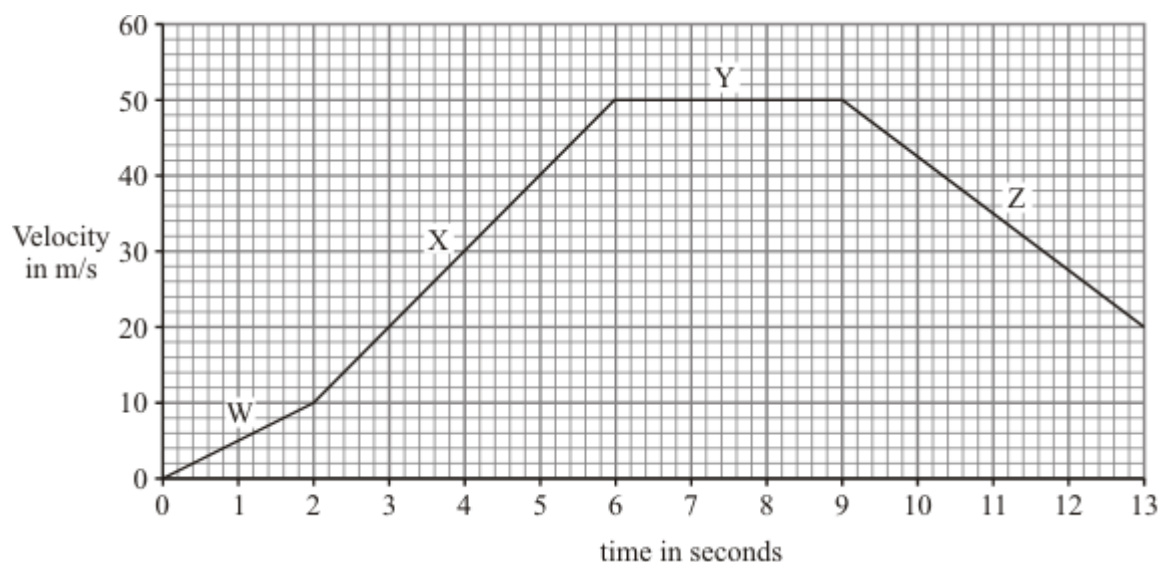
Name of the Student: _____

Max. Marks : 22 Marks

Time : 22 Minutes

Q1.

The graph shows changes in the velocity of a racing car.



(a) Describe the motion of the racing car during:

(i) the period labelled **W**; _____

(1)

(ii) the period labelled **Y**. _____

(1)

(b) Calculate the acceleration of the racing car during the period labelled **X**.
Show clearly how you work out your answer and give the unit.

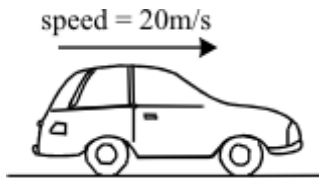
Acceleration = _____

(4)

(Total 6 marks)

Q2.

A car travels along a level road at 20 metres per second.

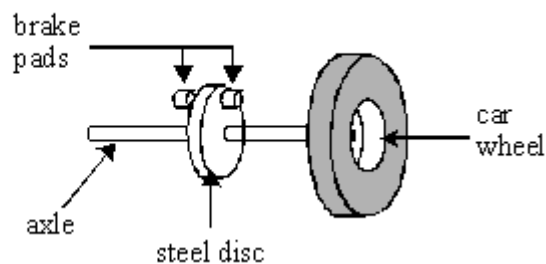
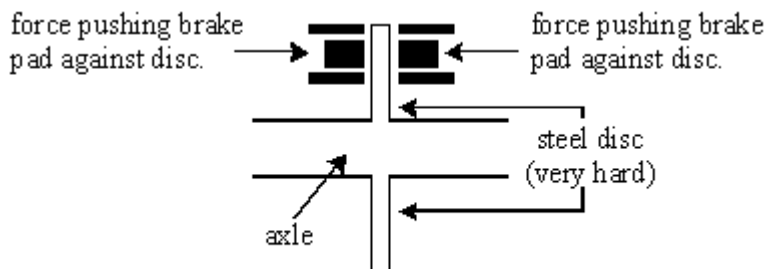


- (a) Calculate the distance travelled by the car in 4 seconds.

(Show your working.)

(3)

- (b) When the brake pedal of the car is pushed, brake pads press against very hard steel discs.



The force of friction between the brake pads and the steel discs gradually stops the car.

What **two** effects does using the brakes have on the **brake pads** and **wheel discs**?

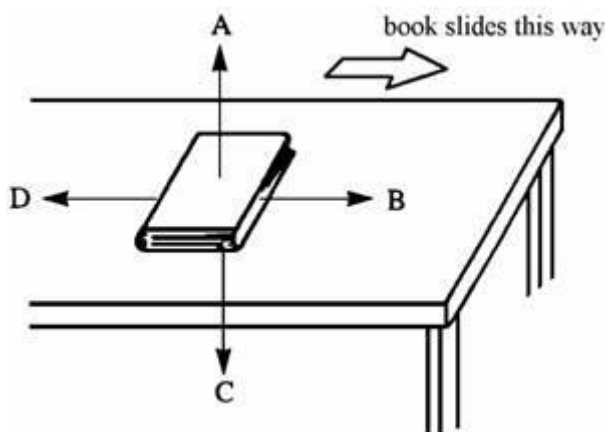
1. _____
2. _____

(3)

(Total 6 marks)

Q3.

When you slide a book across a table, there is a force of friction between the book and the table.



- (a) Which arrow shows the force of friction that acts on the book? _____

(1)

- (b) The force of friction will slow the book down.
Write down **one** other effect that the force of friction will have on the book.

(1)

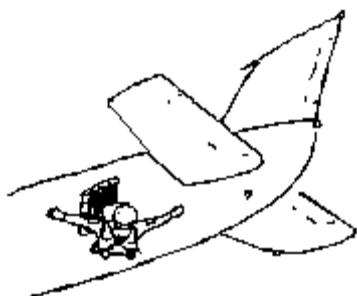
(Total 2 marks)

Q4.

A sky-diver steps out of an aeroplane.

After 10 seconds she is falling at a steady speed of 50m/s.

She then opens her parachute.



After another 5 seconds she is once again falling at a steady speed.

This speed is now only 10m/s.

- (a) Calculate the sky-diver's average acceleration during the time from when she opens her parachute until she reaches her slower steady speed. (Show your working.)

(3)

(b) Explain, as fully as you can:

(i) why the sky-diver eventually reaches a steady speed (with or without her parachute).

(3)

(ii) why the sky-diver's steady speed is lower when her parachute is open.

(1)

(c) The sky-diver and her equipment have a total mass of 75kg. Calculate the gravitational force acting on this mass. (Show your working.)

Answer _____ N

(1)

(Total 8 marks)