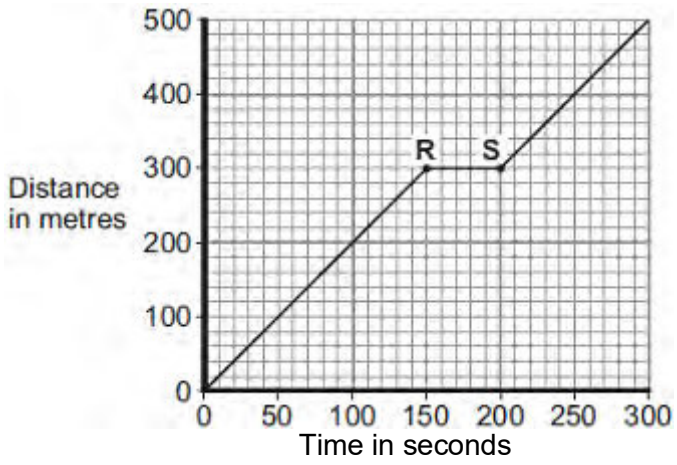
Q1.(a) **Figure 1** shows the distance–time graph for a person walking to a bus stop.

Figure 1



(i) Which **one** of the following statements describes the motion of the person between points **R** and **S** on the graph?

Tick (✓) **one** box.

Not moving ☐

Moving at constant speed ☐

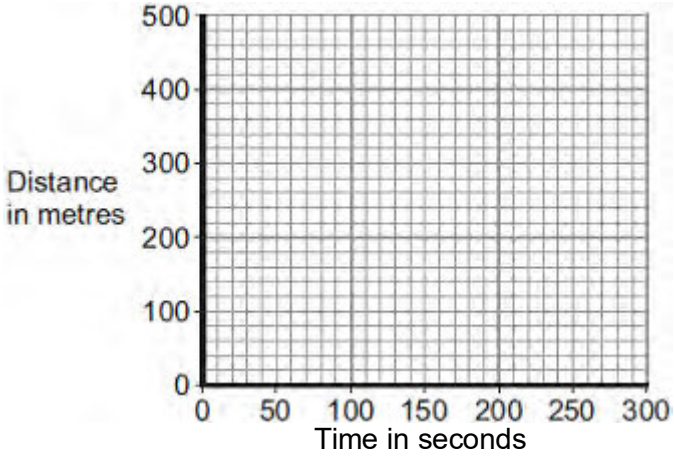
Moving with increasing speed ☐

(1)

(ii) Another person, walking at constant speed, travels the same distance to the bus stop in 200 seconds.

Complete **Figure 2** to show a distance–time graph for this person.

Figure 2



(1)

(b) A bus accelerates away from the bus stop at 2.5 m/s^2.

The total mass of the bus and passengers is 14 000 kg.

Calculate the resultant force needed to accelerate the bus and passengers.

.....

.....

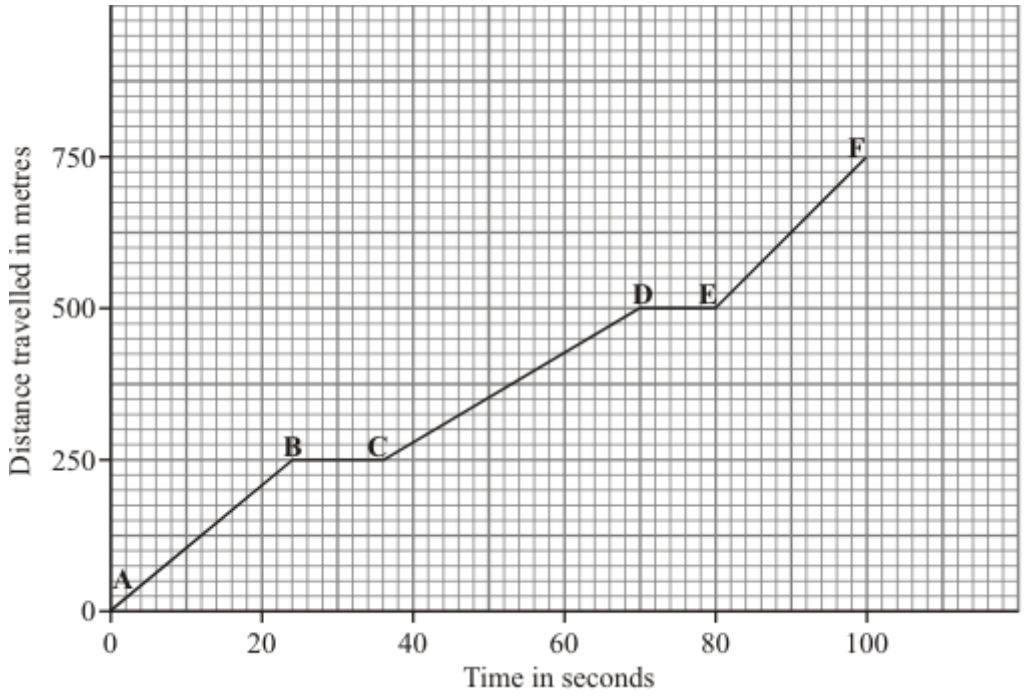
.....

Resultant force = ... N

(2)
(Total 4 marks)

Q2. This question is about a car travelling through a town.

(a) The graph shows how far the car travelled and how long it took.



(i) Between which points was the car travelling fastest? Tick (✓) your answer.

Points	Tick (✓)
A – B	
B – C	
C – D	
D – E	
E – F	

(1)

(ii) Between which points was the car stationary?

.....

.....

(1)

(b) Complete the sentences by writing the correct words in the spaces.

When a car has to stop, the **overall** stopping distance is greater if:

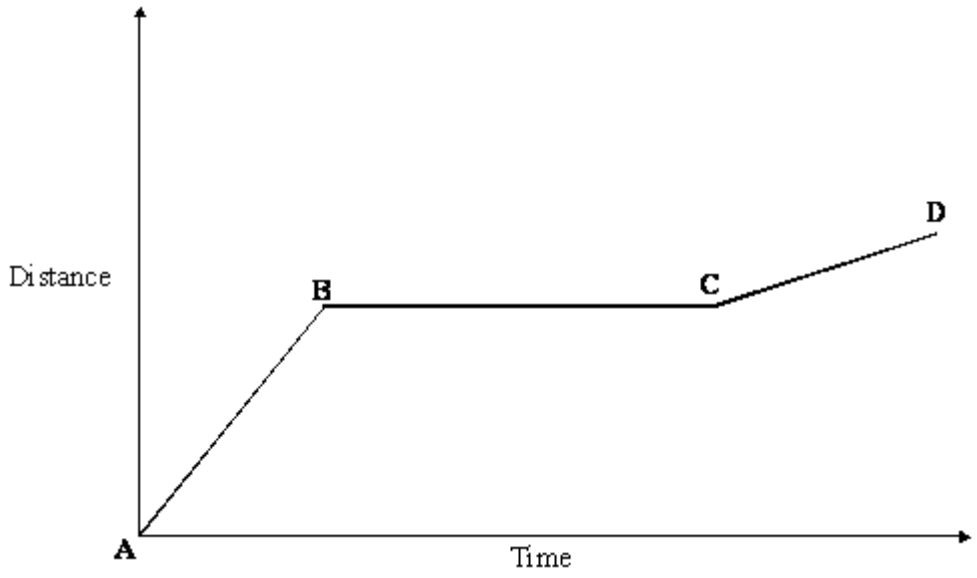
- the car is poorly maintained;
- there are adverse weather conditions;
- the car is travelling ..... ;
- the driver's reactions are ..... .

Also, the greater the speed of the car, then the greater the braking .....

needed to stop in a certain time.

(3)
(Total 5 marks)

Q3. The graph shows the distance a person walked on a short journey.



(a) Choose from the phrases listed to complete the statements which follow. You may use each statement once, more than once or not at all.

standing still

walking at constant speed

walking with an increasing speed

walking with a decreasing speed

(i) Between points **A** and **B** the person is

.....

(1)

(ii) Between points **B** and **C** the person is

.....

(1)

(b) Complete the sentence.

You can tell that the speed of the person between points **A** and **B** is .....

than the speed between points **C** and **D** because .....

.....

(2)

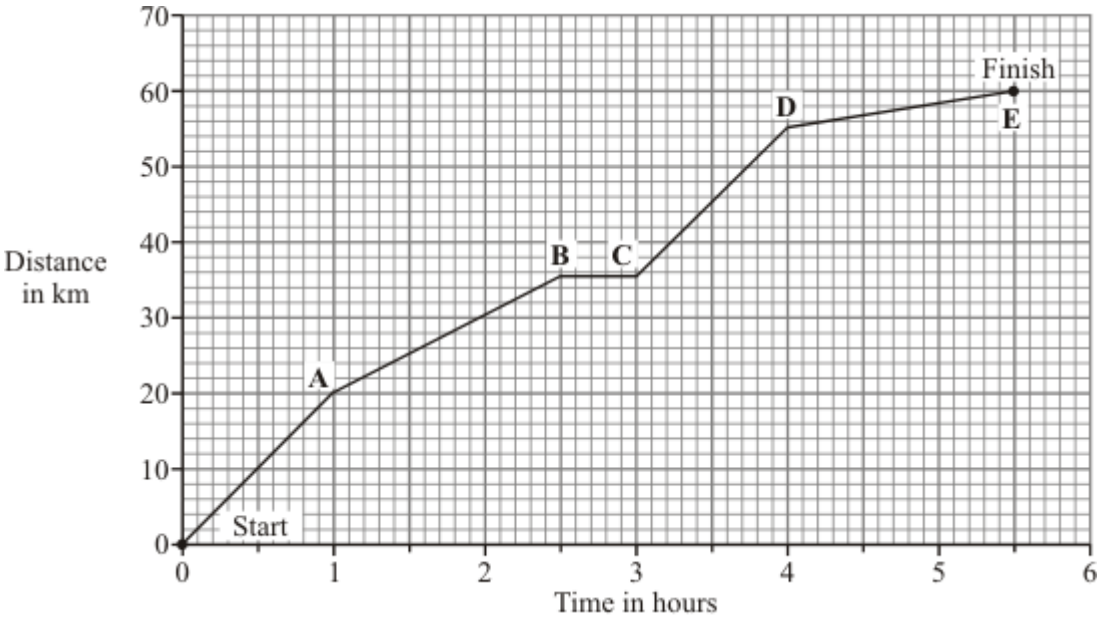
(c) Write the equation which relates distance, speed and time.

.....

(1)

(Total 5 marks)

Q4. A horse and rider take part in a long distance race. The graph shows how far the horse and rider travel during the race.



(a) What was the distance of the race?

distance = ... km

(1)

(b) How long did it take the horse and rider to complete the race?

.....

(1)

(c) What distance did the horse and rider travel in the first 2 hours of the race?

distance = ... km

(1)

(d) How long did the horse and rider stop and rest during the race?

.....

(1)

(e) Not counting the time it was resting, between which two points was the horse moving the slowest?

..... and .....

Give a reason for your answer.

.....

.....

(2)
(Total 6 marks)

Q5. A high-speed train accelerates at a constant rate in a straight line.

The velocity of the train increases from 30 m/s to 42 m/s in 60 seconds.

(a) (i) Calculate the change in the velocity of the train.

.....

Change in velocity = ... m/s

(1)

(ii) Use the equation in the box to calculate the acceleration of the train.

$$\text{acceleration} = \frac{\text{change in velocity}}{\text{time taken for change}}$$

Show clearly how you work out your answer and give the unit.
Choose the unit from the list below.

m/s **m/s²** **N/kg** **Nm**

.....

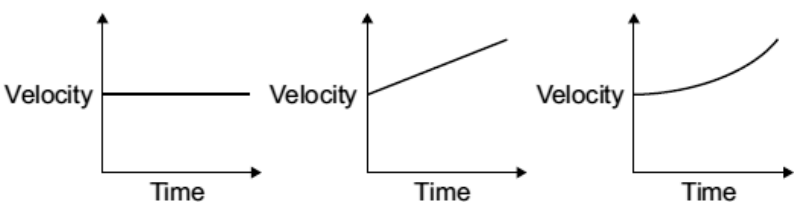
.....

Acceleration = ...

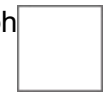
(2)

(b) Which **one** of the graphs, **A**, **B** or **C**, shows how the velocity of the train changes as it accelerates?

Write your answer, **A**, **B** or **C**, in the box.

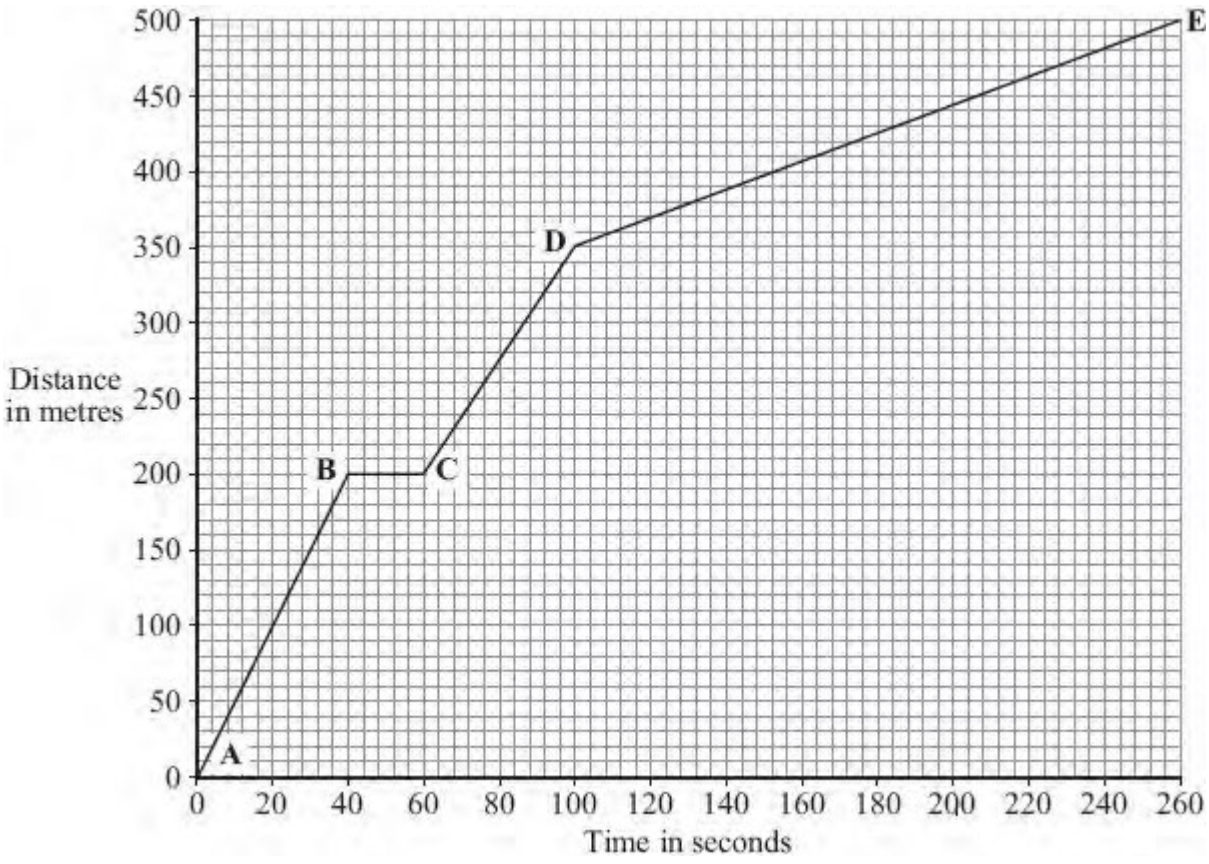


A **B** **C**

Graph 

(1)
(Total 4 marks)

Q6. Part of a bus route is along a high street.
The distance – time graph shows how far the bus travelled along the high street and how long it took.



(a) The bus travels the **slowest** between points **D** and **E**.

How can you tell this from the graph?

.....

.....

(1)

(b) Between which two points was the bus travelling the **fastest**?

Put a tick (✓) in the box next to your answer.

Points	
A – B	

B – C	
C – D	

(1)

(c) There is a bus stop in the high street.
This is marked as point **B** on the graph.

(i) What is the distance between point **A** on the graph and the bus stop?

Distance ..... metres

(1)

(ii) How long did the bus stop at the bus stop?
Show clearly how you work out your answer.

.....

Time = ... seconds

(2)

(d) A cyclist made the same journey along the high street.
The cyclist started at the same time as the bus and completed the journey in 200 seconds. The cyclist travelled the whole distance at a constant speed.

(i) Draw a line on the graph to show the cyclist's journey.

(2)

(ii) After how many seconds did the cyclist overtake the bus?

The cyclist overtook the bus after ..... seconds.

(1)
(Total 8 marks)