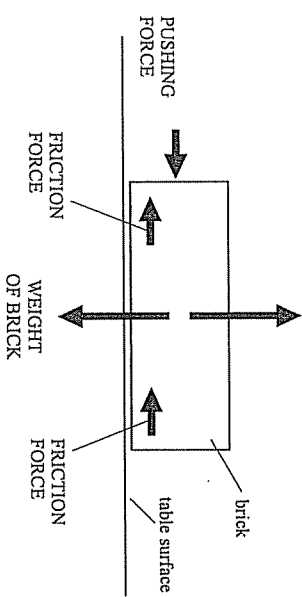


Resultant forces

1. The brick shown in the diagram is being pushed but it is not moving.
UPWARDS FORCE OF TABLE

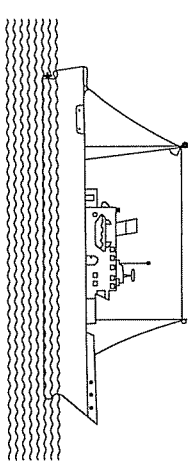


- (a) The pushing force does not make the brick move. Explain why.
.....
(1)
- (b) The weight of the brick does not make it move downwards. Explain why.
.....
(1)

- (c) A bigger pushing force does make the brick slide across the table.
Write down one thing that the sliding brick will do to the surface of the table.
.....
(1)

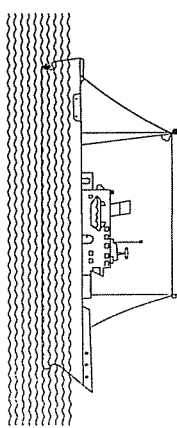
(Total 3 marks)

2. The diagram below shows an empty cargo ship. It is not moving.



- (a) The water exerts a force on the ship. In which direction does this force act?
.....
(1)

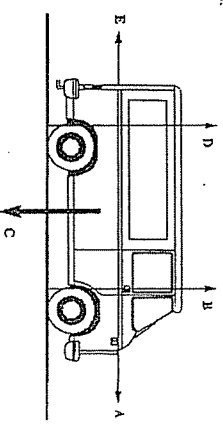
- (b) The diagram below shows the same cargo ship. This time it has a full load of cargo.



- (i) How does the force exerted by the water on the ship change as the ship is loaded?
.....
(1)
- (ii) Why has the force exerted by the water changed?
.....
(1)

(Total 3 marks)

3. Five forces, A, B, C, D and E act on the van.



- (a) Complete the following sentences by choosing the correct forces from A to E.
Force is the forward force from the engine.
Force is the force resisting the van's motion.
(1)

- (b) The size of forces A and E can change. Complete the table to show how big force A is compared to force E for each motion of the van. Do this by placing a tick in the correct box. The first one has been done for you.

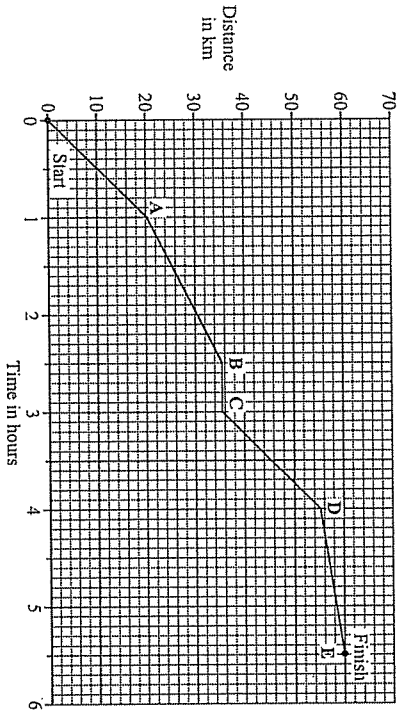
MOTION OF VAN	FORCE A SMALLER THAN FORCE E	FORCE A EQUAL TO FORCE E	FORCE A BIGGER THAN FORCE E
Not moving		✓	
Speeding up			
Constant speed			
Slowing down			

- (c) When is force E zero?
.....
(1)

(Total 11 marks)

Forces and motion

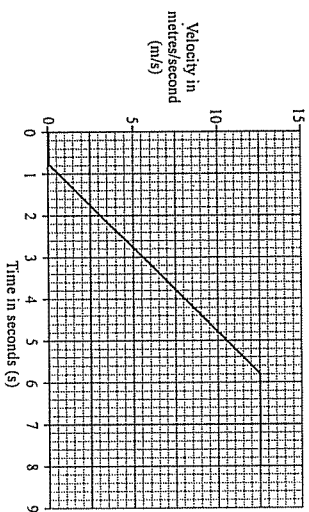
1. A horse and rider take part in a long distance race. The graph shows how far the horse and rider travel during the race.



- (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 (1)
Give a reason for your answer:
.....
.....

(Total 6 marks) (2)

2. A car travelling along a straight road has to stop and wait at red traffic lights. The graph shows how the velocity of the car changes after the traffic lights turn green.



- (a) Between the traffic lights changing to green and the car starting to move there is a time delay. This is called the reaction time. Write down one factor that could affect the driver's reaction time.
..... (1)
- (b) Calculate the distance the car travels while accelerating. Show clearly how you work out your answer.
..... metres (3)
- (c) Calculate the acceleration of the car. Show clearly how you work out your final answer and give the units.
..... Acceleration = (4)
- (d) The mass of the car is 900 kg.
(i) Write down the equation that links acceleration, force and mass.
..... (1)
(ii) Calculate the force used to accelerate the car. Show clearly how you work out your final answer.
..... Force = newtons (2)

(Total 11 marks) (2)