

SMART EXAM RESOURCES
SUBJECT: COORDINATED SCIENCES [PHYSICS]
PAPER 4
ADDING FORCES
SET 3 QP-MS

1 (a) Fig. 4.1 shows a car travelling from left to right.

Two horizontal forces affect its motion. These are the forward driving force and air resistance.

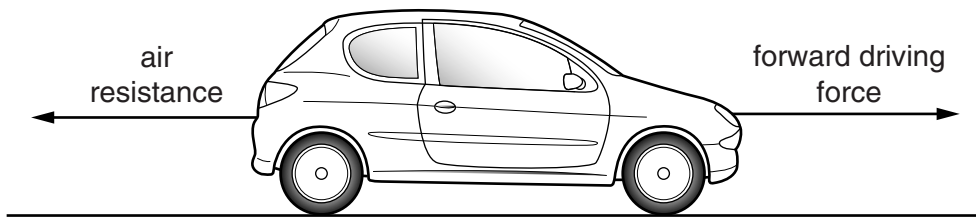


Fig. 4.1

(i) The car is accelerating.

Tick one of the boxes to show which of the following statements is correct.

The driving force is greater than the air resistance.

The driving force is equal to the air resistance.

The driving force is less than the air resistance.

Explain your answer.

.....
.....[1]

MARK SCHEME:

- (a) (i) *(positive acceleration: driving force is greater than air resistance OR
negative acceleration: driving force is less than air resistance)*
there is a resultant/net force/sum of forces is not zero ;

[1]

2

The weight of the rocket on take-off is 20 000 000 N.

When the rocket blasts off from the Earth's surface, it experiences a thrust force of 25 000 000 N.

Explain why the thrust force must be greater than the weight of the rocket.

.....
.....[1]

MARK SCHEME:

need resultant upwards force to accelerate the rocket ;

[1]

- 3 (a) Fig. 4.1 shows an athlete running a race.



Fig. 4.1

Some forces acting on the athlete are

- a support force, **A**, from the ground pushing on the athlete,
- a friction force, **B**, from the ground helping the athlete to move,
- the weight, **C**, of the athlete,
- the force of air resistance, **D**, which slows the athlete.

Draw arrows on Fig. 4.1 to show the direction of each of these forces. Label each force clearly using the letters **B – D**. The direction of force **A** has been drawn for you. [2]

MARK SCHEME:

- (a) B arrow pointing right;
C arrow pointing vertically downwards;
D pointing left;

2 marks for all three correct, 1 mark for 1 correct

2