

## O Level Combined Physics MCQs

### Forces Test 1.0

Q1

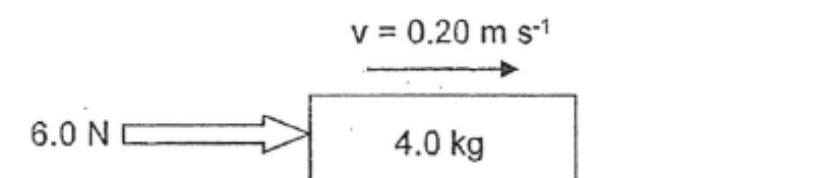
When a wooden block of mass 5.0 kg is pulled with a force of 20 N along a rough surface, it moves with a constant velocity of 1.0 m/s.

What is the size of the frictional force on the rough surface?

- A 0 N                                      B 5.0 N  
 C 15 N                                      D 20 N

Q2

A box of mass 4.0 kg moves with a constant speed of 0.20 m s<sup>-1</sup> when a force of 6.0 N is applied.



What are the frictional force and the resultant force acting on the box?

	resultant force	frictional force
(A)	0.0	6.0
(B)	0.8	5.2
(C)	5.2	0.8
(D)	6.0	0.0

Q3

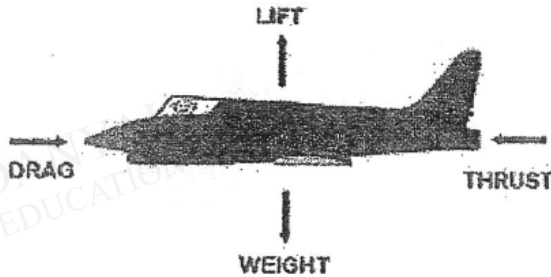
Two forces of 5 N and 6 N act on an object at the same time. Which of the following cannot be the resultant force that is acting on the object?

- (A) 3 N                                      (C) 11 N  
 (B) 5 N                                      (D) 12 N

Q4

The following diagram shows the forces on a plane. The thrust  $T$  and drag  $D$  act horizontally on the plane. The weight  $W$  and lift  $L$  act vertically on the plane.

The plane is accelerating forward at a constant altitude.



Which of the following description of the forces are true?

	horizontal forces	vertical forces
A	$D > T$	$L = W$
B	$T = D$	$L > W$
C	$T > D$	$L > W$
D	$T > D$	$L = W$

Q5

A mass experiences a constant resultant force.

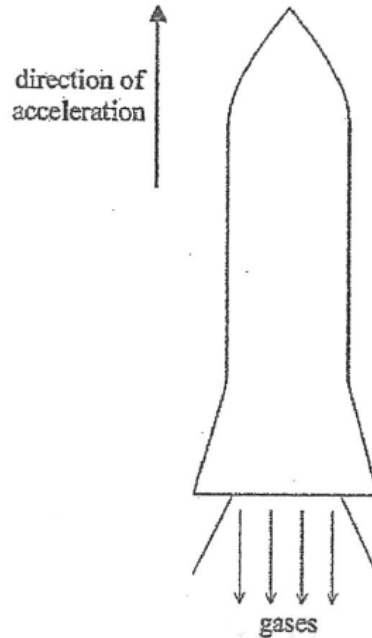
Which of the following must be true of the motion of the mass?

- A It moves with constant acceleration.
- B It moves with constant speed.
- C It's velocity changes at a constant rate.
- D It's displacement changes at a constant rate.

Q6

A rocket accelerates vertically upwards by ejecting high-speed gases vertically downwards as shown in the diagram.

At the instant shown, the weight of the rocket is  $W$  and the magnitude of the force the rocket exerts on the gases is  $T$ .



What is the magnitude of the net force on the rocket?

- A  $W$       B  $T$       C  $T + W$       D  $T - W$

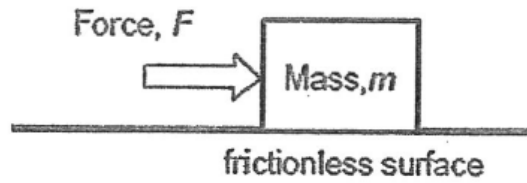
Q7

Under free-fall, both a book and a leaf would take the same time to fall from the same height to the same horizontal level. Which of the following statements is correct?

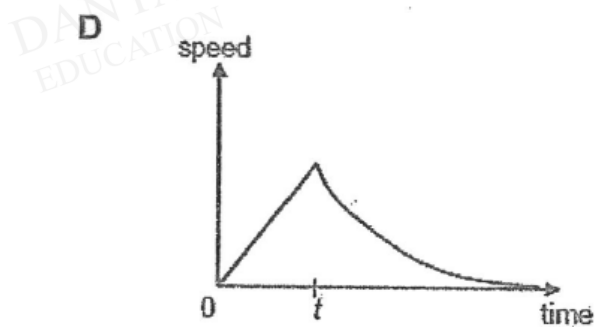
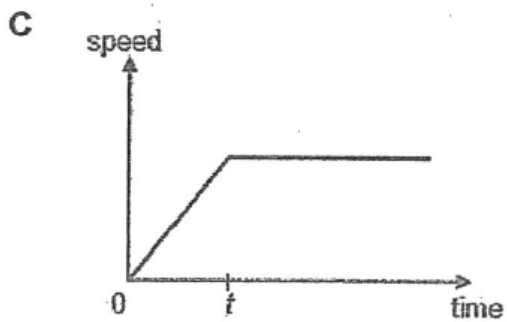
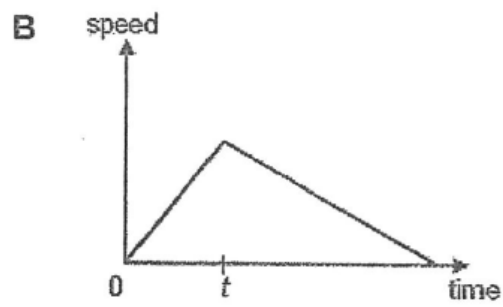
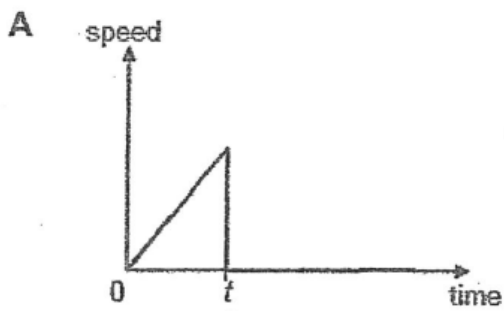
- A Both the book and the leaf are of the same mass.  
B Both the book and the leaf are of the same volume.  
C Both the book and the leaf fall at the same constant speed.  
D Both the book and the leaf fall at the same constant acceleration.

Q8

A mass,  $m$ , is being pushed by a force,  $F$ , on a frictionless surface as shown in the figure below. The force is being applied for  $t$  s and after which the force is removed.

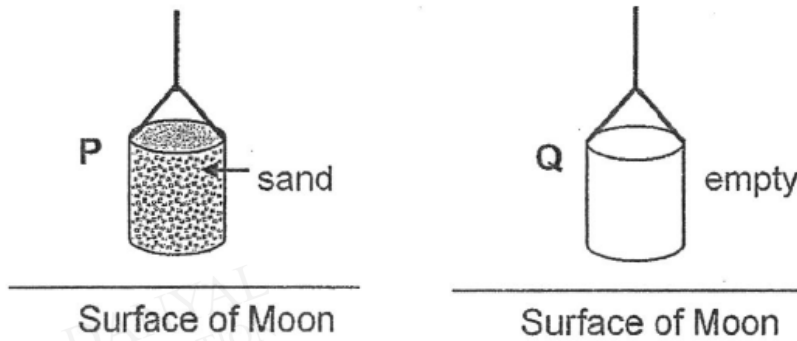


Which of the following speed-time graphs illustrates the motion of the mass for the whole duration?



Q9

The diagrams show a can **P**, filled with sand and a similar can **Q**, which is empty. They are hung close to the surface of the moon.



Which of the following is correct?

- A It is easier to push **P** because it has more inertia due to its greater mass.
- B It is easier to push **Q** because it has less inertia due to its smaller mass.
- C It is easier to push **Q** because it has a smaller weight.
- D It is equally easy to push **P** and **Q** as there is less gravitational force on the Moon.

Q10

A car of mass 1000 kg is moving on a road with an acceleration of  $2.0 \text{ m/s}^2$ .  
What is the driving force of the engine if the car experiences a constant resistance of 1000 N?

- A 500 N
- B 1000 N
- C 2000 N
- D 3000 N

**Answers**

**Forces Test 1.0**

Q1 D

Q2 A

Q3 D

Q4 D

Q5 C

Q6 D

Q7 D

Q8 C

Q9 B

Q10 D

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