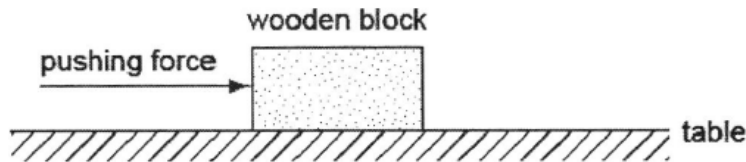# O Level Pure Physics MCQs

Forces Test 2.0

Q1

A wooden box of mass 2.0 kg is pushed horizontally across a table.

If the acceleration of the block is 0.40 m/s² and the frictional force acting against the block's motion is 20 N, then the magnitude of the pushing force is _____.

A   0.80 N
B   19.2 N
C   20 N
D   20.8 N

Q2

7.   An object has a mass of 15 kg. It is pushed horizontally by a force of 40 N. The frictional force is 10 N. What is the acceleration of the object?

A 0.50 ms^{-2}
B 1.50 ms^{-2}
C 2.00 ms^{-2}
D 2.70 ms^{-2}

Q3

8.   Two blocks with masses 4M and 2M are pushed along a horizontal frictionless surface by a horizontal applied force F as shown in the diagram. During the motion, both blocks exert equal and opposite forces against each other. What is the magnitude of this equal but opposite force?
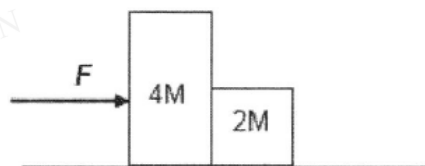
A $\dfrac{F}{3}$

B $\dfrac{F}{2}$

C $\dfrac{2F}{3}$

D F

Q4

A sky-diver, jumps out of a plane and falls towards the ground. Soon, he reaches terminal velocity. Which of the following statements is not true?

A   The acceleration when the sky-diver exits the plane is 10 m/s².
B   The sky-diver's speed decreases until he reaches terminal velocity.
C   At terminal velocity, there is no net force acting on the sky-diver.
D   The sky-diver's acceleration decreases to zero as he falls from the plane.

Q5

A car travels along a road at 50 km/h. The driver applies the same braking force at the same place on a day when the surface is dry and then on a day when the road is wet.

On the wet surface, how many of these distances are greater than on the dry surface?

braking distance	stopping distance	thinking distance
A 0		

A   0   B   1   C   2   D   3

Q6

A brick of mass 4 kg accelerates uniformly at 3 m/s² when it is pushed horizontally across a rough surface using a forward force of 15 N.
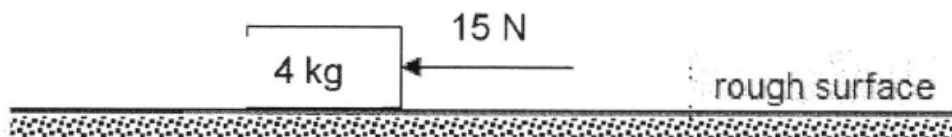
What forward force is needed instead to move it at constant speed?

A   3.0 N   B   4.0 N   C   12.0 N   D   15.0 N

Q7

A large bucket, lifted by a rope attached to a crane, is used on a building site to raise heavy loads.

The bucket, of total mass m when fully loaded, rises at a uniform velocity v before decelerating uniformly to rest in time t. The gravitational field strength is g.

What is the difference between the tensions in the rope supporting bucket when the bucket is travelling at uniform velocity and when the bucket is decelerating?

A $\dfrac{-mg}{t}$ **B** $\dfrac{-mv}{t}$ **C** $m\left(g - \dfrac{v}{t}\right)$ **D** $m\left(\dfrac{v}{t} - g\right)$

Q8

A heavy box is being balanced on a slope as shown.
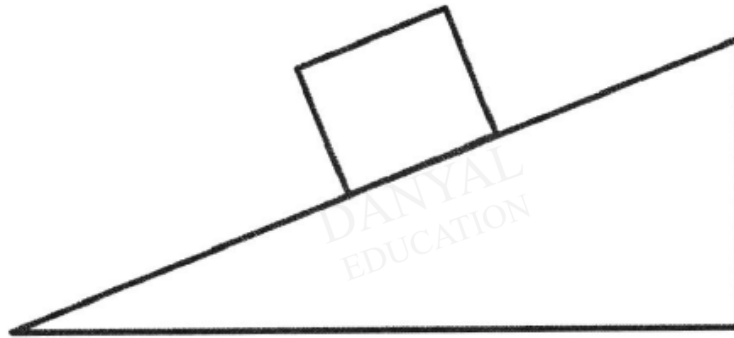
How many forces are acting on the box?

A 0 **B** 2 **C** 3 **D** 4

Q9

A car of mass 800 kg is moving on a horizontal road. When the car is moving forward at a constant acceleration of 1.5 m/s², it encounters the combined forces of air resistance and frictional force from the road.

If the combined resistive forces are 500 N, what is the **forward driving force F** required to accelerate the car at 1.5 m/s²?

A 300 N **B** 500 N **C** 1200 N **D** 1700 N

Q10

A boat is moving in the direction shown with a speed of 5 ms⁻¹ as measured by Nico who is at rest on the beach. Aziz walks along the deck of the boat in the direction shown with a speed of 2 ms⁻¹ measured relative to the boat.
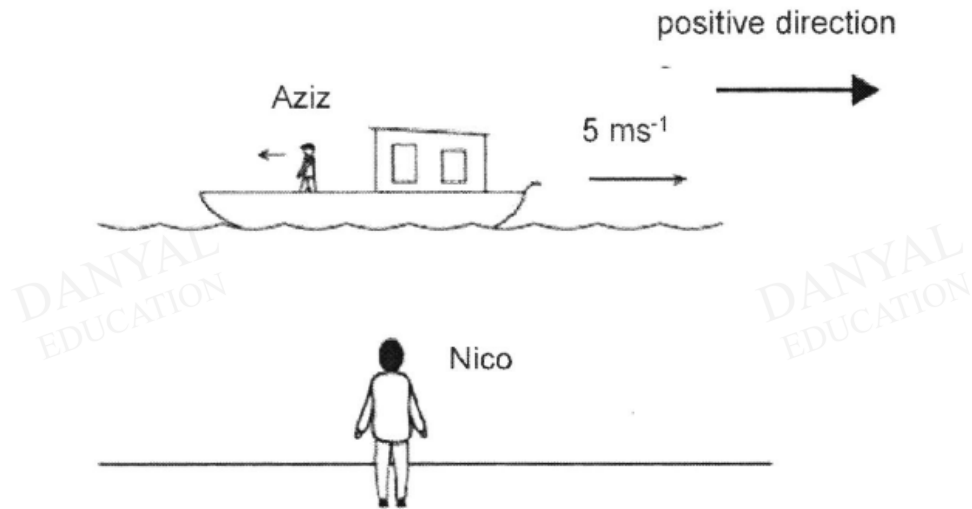
If velocity is measured as positive in the direction shown, what is the velocity of Aziz relative to Nico?

A   - 7 ms⁻¹
B   - 3 ms⁻¹
C   3 ms⁻¹
D   7 ms⁻¹

Answers

Forces Test 2.0

Q1 D

Q2 C

Q3 A

Q4 B

Q5 C

Q6 A

Q7 B

Q8 C

Q9 D

Q10 C