4.1 Newton's Laws of Motion

Question Paper

Course	CIE A Level Physics (9702) 2019-2021
Section	4. Dynamics
Topic	4.1 Newton's Laws of Motion
Difficulty	Easy

Time allowed: **10**

Score: **/10**

Percentage: **/100**

Question 1

As a car accelerates uniformly, its momentum is measured at regular intervals

A graph of the momentum of the car is plotted against time

What is evaluated by finding the gradient of the graph at a particular time?

A the acceleration of the car

B the resultant force on the car

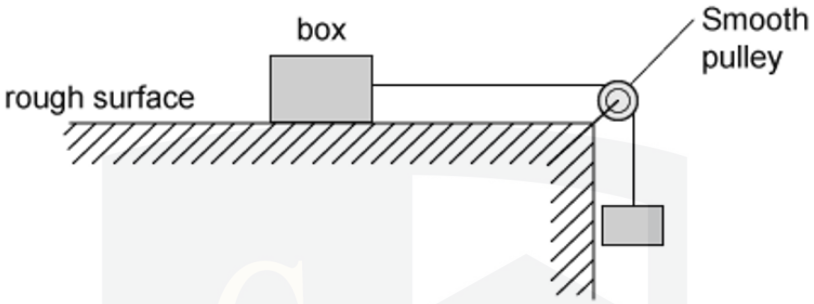
C the kinetic energy of the car

D the velocity of the car

[1 mark]

Question 2

A box rests on a horizontal, rough surface. A string attached to the box passes over a smooth pulley and supports a mass at its other end.



When the box is released, what forces are acting on it?

A weight only

B friction and weight

C friction, weight and reaction

D tension, friction, weight and reaction

[1 mark]

Question 3

The symbol *g* represents the acceleration of free fall

Which of these statements is correct?

A *g* is gravity

B *g* is reduced by air resistance

C *g* is the weight of an object

D *g* is the ratio weight/mass

[1 mark]

Question 4

Which is **not** one of Newton's laws of motion?

A if body A exerts a force on body B, then body B exerts an equal and oppositely directed force on body A

B the rate of change of momentum of a body is directly proportional to the external force acting on the body and takes place in the direction of the force

C the total momentum of a system of interacting bodies remains constant, providing no external force acts

D a body continues in a state of rest or of uniform motion in a straight line unless acted upon by some external force

[1 mark]

Question 5

An egg is dropped from the top of a three-storey building. It falls through air until it reaches the ground

What remains constant throughout the fall?

A acceleration of the egg

B weight of the egg

C velocity of the egg

D air resistance on the egg

[1 mark]

Question 6

A force *F* is applied to a freely moving object. At one instant of time, the object has velocity *v* and acceleration *a*.

Which quantities must be in the same direction?

A *a* and *v* only

B *v*, *a* and *F*

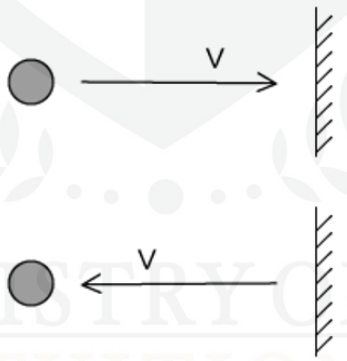
C *v* and *F* only

D *F* and *a* only

[1 mark]

Question 7

An object travelling with velocity *v* strikes a wall and rebounds as shown



Which property of the object is **not** conserved?

A Momentum

B Mass

C kinetic energy

D Speed

[1 mark]

Question 8

What is meant by the mass and by the weight of an object on the Earth?

	Mass	weight
A	its momentum divided by its velocity	the work done in lifting it one metre
B	the gravitational force on it	the property that resists its acceleration
C	the property that resists its acceleration	the pull of the Earth on it
D	the pull of the Earth on it	its mass divided by the acceleration of free fall

[1 mark]

Question 9

A resultant force causes a body to accelerate.

What is equal to the resultant force?

A the acceleration of the body per unit mass

B the change in kinetic energy of the body per unit time

C the change in momentum of the body per unit time

D the change in velocity of the body per unit time

[1 mark]

Question 10

A cyclist is riding at a steady speed on a level road

According to Newton's third law of motion, what is equal and opposite to the backward push of the back wheel on the road?

A the force exerted by the cyclist on the pedals

B the total air resistance and friction force

C the tension in the cycle chain

D the forward push of the road on the back wheel

[1 mark]