6.2 Energy: GPE & KE

Question Paper

Course	CIE A Level Physics (9702) 2019-2021
Section	6. Work, Energy & Power
Topic	6.2 Energy: GPE & KE
Difficulty	Easy

Time allowed: **10**

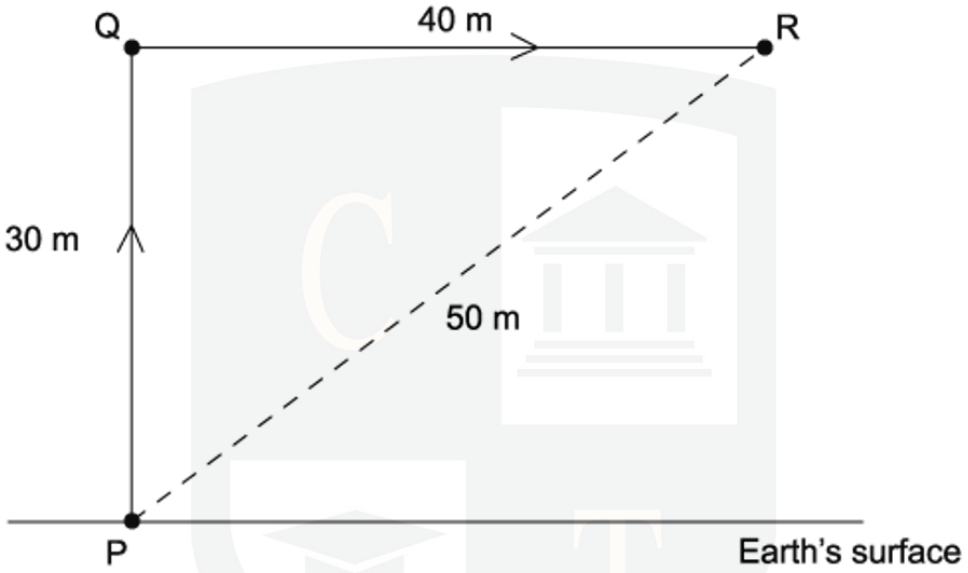
Score: **/10**

Percentage: **/100**

Question 1

A stone of weight 4.0 N in the Earth's gravitational field is moved from P to Q and then to R along the path shown.

How much potential energy does the stone gain?



A 120 J **B** 200 J **C** 280 J **D** 1200 J

[1 mark]

Question 2

A cyclist is travelling at a constant speed up a hill. The frictional force resisting the cyclist's motion is 8.0 N.

The cyclist uses 450 J of energy to travel 20 m.

What is the increase in gravitational potential energy of the cyclist?

A 160 J **B** 290 J **C** 440 J **D** 610 J

[1 mark]

Question 3

The formula for gravitational potential energy is $E_p = mgh$

From which concept is this equation derived?

A Work Done = Force × Distance

B Force = Mass × Acceleration

C Power = Force × Speed

D Distance = Speed × Time

[1 mark]

Question 4

The formula for kinetic energy is $E_k = \frac{1}{2}mv^2$

Which kinematic equation is used in the derivation of this formula?

A $v = u + at$

B $s = \left(\frac{u+v}{2}\right)t$

C $s = ut + \frac{1}{2}at^2$

D $v^2 = u^2 + 2as$

[1 mark]

Question 5

A car with a total mass of 1400 kg is travelling at 108 km h^{-1}

What is the kinetic energy of the car?

A 21 kJ **B** 42 kJ **C** 630 kJ **D** 8160 kJ

[1 mark]

Question 6

To get to his office from the entrance of the building, a man has to walk up six flights of stairs.

The height of each flight is 2.5 m and the man has a mass of 80 kg.

What is the approximate gain in the man's gravitational potential energy during the climb?

A 1200 J **B** 2000 J **C** 4800 J **D** 12 000 J

[1 mark]

Question 7

A car of mass 1000 kg travels forwards at 25 m s^{-1} and then backwards at 5 m s^{-1}

What is the change in the kinetic energy of the car?

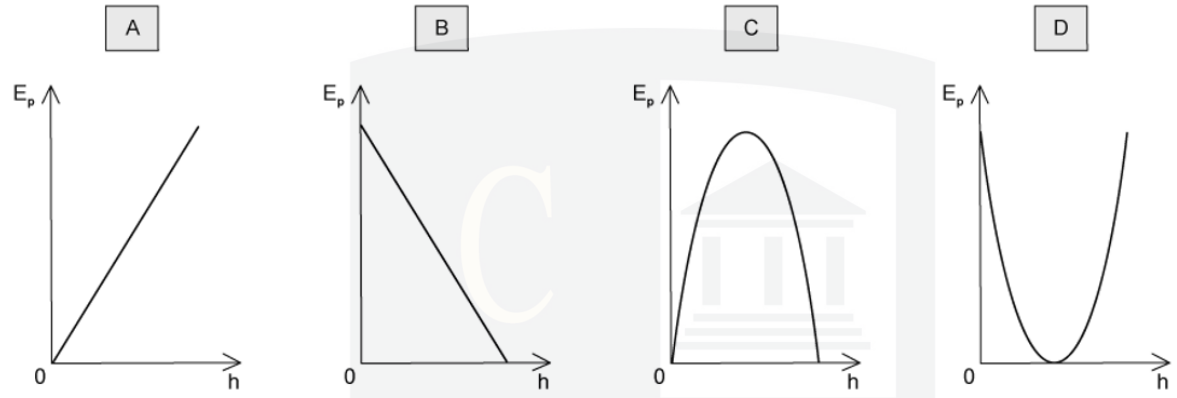
A 200 kJ **B** 300 kJ **C** 325 kJ **D** 450 kJ

[1 mark]

Question 8

An object is thrown into the air.

Which graph shows how the potential energy E_p of the object varies with height h above the ground?



[1 mark]

Question 9

A body travelling with a speed of 10 m s^{-1} has kinetic energy 1500 J.

If the speed of the body is increased to 40 m s^{-1}, what is its new kinetic energy?

A 4.5 kJ **B** 6 kJ **C** 24 kJ **D** 1350 kJ

[1 mark]

Question 10

What is the approximate kinetic energy of an Olympic athlete when running at maximum speed during a 100m race?

A 400 J **B** 4000 J **C** 40 000 J **D** 400 000 J

[1 mark]