6.3 Power

Question Paper

Course	CIE A Level Physics (9702) 2019-2021
Section	6. Work, Energy & Power
Topic	6.3 Power
Difficulty	Medium

Time allowed: **10**

Score: **/4**

Percentage: **/100**

Question 1

A mass is raised vertically. In a time *t*, the increase in its gravitational potential energy is E_p and the increase in its kinetic energy is E_k.

What is the average power input to the mass?

A $(E_p - E_k)t$

B $(E_p + E_k)t$

C $\frac{E_p - E_k}{t}$

D $\frac{E_p + E_k}{t}$

[1 mark]

Question 2

The force resisting the motion of a car is taken as being proportional to the square of the car's speed. The magnitude of the force at a speed of 20 m s^{-1} is 800N.

What effective power is required from the car's engine to maintain a steady speed of 40 m s^{-1}?

A 32 kW **B** 64 kW **C** 128 kW **D** 512 kW

[1 mark]

Question 3

A conveyor belt is driven at velocity *v* by a motor. Sand drops vertically on to the belt at a rate of m kg s^{-1}.

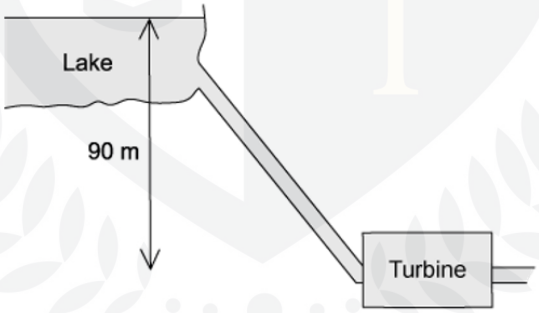
What is the additional power needed to keep the conveyor belt moving at a steady speed when the sand starts to fall on it?

A $\frac{1}{2}mv$ **B** mv **C** $\frac{1}{2}mv^2$ **D** mv^2

[1 mark]

Question 4

Water flows from a lake into a turbine that is a vertical distance of 90 m below the lake, as shown



The mass flow rate of the water is 2400 kg min^{-1}. The turbine has an efficiency of 75%.

What is the output power of the turbine?

A 26 kW **B** 35 kW **C** 1.6 MW **D** 2.1 MW

[1 mark]