

# PQ 12

Questions and Answers

# Q1

- What is the potential energy of a 10kg mass:
  - a) 100m above the surface of the earth
  - b) at the bottom of a vertical mine shaft 1000m deep.

# Q2

- A car of mass 1000 kg travelling at 30m/s has its speed reduced to 10m/s by a constant breaking force over a distance of 75m.
- Find:
- The cars initial kinetic energy
- The final kinetic energy
- The breaking force

# Q3

- A constant force of 2kN pulls a crate along a level floor a distance of 10 m in 50s.
- What is the power used?

# Q3 alternative

- Alternatively we could have calculated the speed first and then calculated power

# Q4

- A hoist operated by an electric motor has a mass of 500 kg. It raises a load of 300 kg vertically at a steady speed of 0.2 m/s. Frictional resistance can be taken to be constant at 1200 N.
- What is the power required?

## Q5

- Find the work done in raising a lift of people through 20 m if the total mass is 2000kg.

## Q6

- What is the kinetic energy of a mass of 0.08 kg travelling at 16 m/s?

## Q7

- Find the kinetic energy of a body if mass 2 kg when it falls under gravity a distance of 2m from rest.

## Q8

- A man of mass 70 kg runs up a flight of 50 steps each 0.25 m high in 25 s. What is his rate of working?

## Q9

- A car engine has an output of 8 kW. Find the resistance to motion when the car travels at a steady speed of 15 m/s along a level road.

## Q 10

- The engine of a car has a maximum power output of 50 kW and the car's transmission has an efficiency of 70%. If the mass of the car is 1 tonne and the total resistance to motion is a constant 600 N, find the maximum speed which the car can achieve a) along a horizontal track.