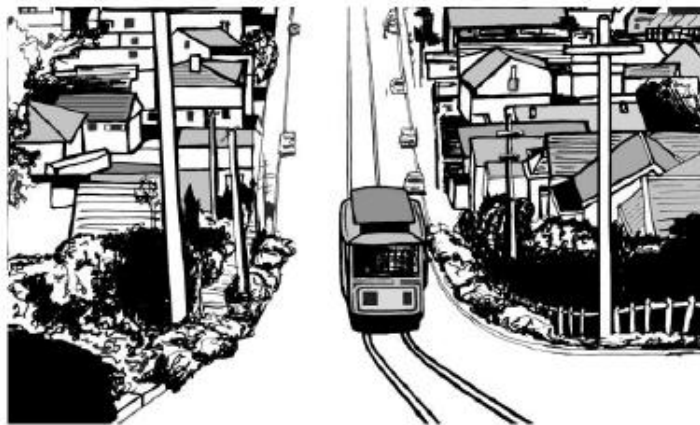


**2.7 Conservation of Energy Past Paper Questions**

1. State the Principle of Conservation of Energy. (1)
2. State two examples of energy transformation in a thermal power station (2)
3. Calculate the energy transferred in each of the following situations.  
(Use either the equation  $E_p = mgh$ )
  - (a) A lift in a hotel moves a total mass of 1000kg up through a height of 24m. (3)
  - (b) A hydroelectric power station pumps 20000kg of water up a height of 80m. (3)
4. A railway train travels uphill between two stations.



The information about the train journey is given below.

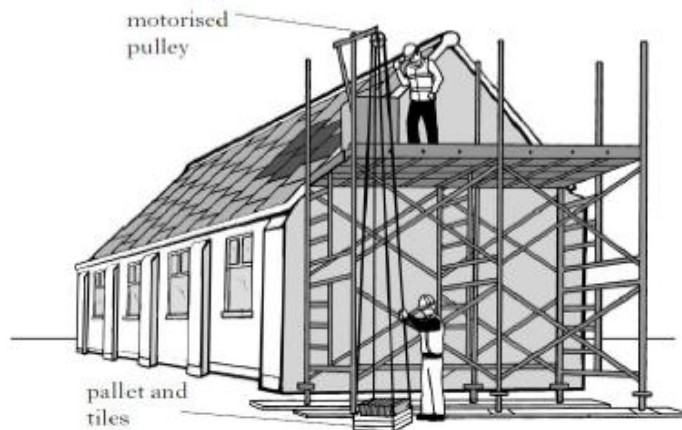
Average speed of the train	$5\text{ms}^{-1}$
Time for journey	150 s
Power of train	120kW
Mass of train plus passengers	20 000 kg

- (a) Calculate the energy used by the train during this journey. (3)
- (b) Calculate the height gained by the train during this journey. (3)
- (c) Suggest why the actual height gained by the train, is less than calculated in part (b). (1)

5. While repairing a school roof, workmen lift a pallet of tiles from the ground to the top of the scaffolding.

This job is carried out using a motorised pulley system.

The pallet and tiles have a total mass of 230 kg.



- (a) Calculate the weight of the pallet and tiles. (3)
- (b) State the minimum force required to lift the pallet and tiles. (1)
- (c) The pallet and tiles are lifted to a height of 12 m.  
Calculate the gravitational potential energy gained by the pallet and tiles. (3)
- (d) When the tiles are being unloaded onto the scaffolding, at a height of 12 m, one tile falls.

The tile has a mass of 2.5 kg.

- Calculate the final speed of the tile just before it hits the ground.** (3)  
Assume the tile falls from rest.

**Total Marks Available = 26**