

Q1 (1 mark)

To make work easier / change force or distance

Q2 (1 mark)

Force decreases

Q3 (1 mark)

Distance increases

Q4 (1 mark)

A quantity that can be transferred or stored

Q5 (1 mark)

It stays the same / is conserved

Q6 (1 mark)

Lever / pulley / ramp / gear (any suitable example)

Q7 (1 mark)

Elastic potential energy

Q8 (1 mark)

Gravitational potential energy

Q9 (1 mark)

In chemical bonds

Q10 (2 marks)

Thermal (1) and light energy (1) (accept heat/light)

Q11 (2 marks)

Smaller force over larger distance OR vice versa (1)

Product of force and distance stays constant (1)

Q12 (2 marks)

Energy cannot be created or destroyed (1)

Only transferred or transformed (1)

Q13 (3 marks)

Gravitational potential energy decreases (1)

Kinetic energy increases (1)

Energy transferred to heat/sound on impact (1)

Q14 (3 marks)

Work is done stretching spring (1)

Elastic potential energy stored (1)

Energy increases in spring (1)

Q15 (3 marks)

- Chemical energy in fuel (1)
- Released as heat and light (1)
- Transferred to surroundings (1)

Q16 (3 marks)

- Ramp reduces force needed (1)
- Increases distance moved (1)
- Same energy/work done overall (1)

Q17 (3–4 marks)

- Gears change force and speed (1)
- Smaller force needed to climb hill (1)
- Trade-off between force and distance/speed (1)
- Energy conserved overall (1)

Q18 (3–4 marks)

- Gravitational potential to kinetic energy (1)
- Kinetic energy increases on fall (1)
- Energy transferred to heat/sound on impact (1)
- Energy conserved overall (1)

Q19 (4 marks)

- Elastic potential energy stored (1)
- Energy released when band released (1)
- Kinetic energy increases (1)
- Energy transferred to surroundings (1)

Q20 (4 marks)

- Chemical energy store in food/body (1)
- Energy transferred by respiration (1)
- Transferred into movement/kinetic energy (1)
- Some energy transferred as thermal energy to surroundings (1)

Q21 (6 marks)

Level 1 (1–2 marks)

- Simple statements about force or distance
- Limited understanding of energy conservation

Level 2 (3–4 marks)

Mentions force-distance trade-off
Some idea that energy is conserved
Partial explanation of machines

Level 3 (5–6 marks)

Clear explanation that simple machines trade force for distance
Work/energy remains constant (force $\times$ distance)
Energy is transferred, not created
Correct use of scientific reasoning and examples

Model Answer:

Simple machines allow a smaller force to be used over a larger distance, or a larger force over a smaller distance. Although force and distance change, the total work done (force $\times$ distance) remains the same. This means energy is not created or lost, only transferred. The machine changes how the energy is used, but the total energy before and after stays the same.

Q22 (6 marks)

Level 1 (1–2 marks)

Basic statements about dropping objects
Limited sequence of energy changes

Level 2 (3–4 marks)

Gravitational potential and kinetic energy mentioned
Some correct description of energy transfer
Some reference to energy loss to surroundings

Level 3 (5–6 marks)

Clear sequence from start to finish
Gravitational potential energy decreases
Kinetic energy increases during fall
Energy transferred to heat and sound on impact
Object stops when energy is transferred to surroundings
Clear, linked scientific explanation

Model Answer:

When the ball is dropped it has gravitational potential energy due to its height. As it falls, this energy is transferred into kinetic energy as it speeds up. When it hits the ground, the kinetic energy is transferred into heat and sound energy due to the impact and deformation. The ball eventually comes to rest because its energy is transferred to the surroundings, mainly as thermal energy, so there is no kinetic energy left.