Work, Energy and Power – 2020 IGCSE 0625

1. Nov/2020/Paper_11/No.9

A man jumps from a stationary balloon. After falling several hundred metres, he opens his parachute.

At which position is his kinetic energy greatest?

A just after he jumps from the balloon

B just before he opens his parachute

C just after his parachute opens

D just before he lands

2. Nov/2020/Paper_11/No.11

To calculate the power produced by a force, the size of the force must be known.

What else needs to be known to calculate the power?

	the distance that the force moves the object	the time for which the force acts on the object
A	✓	✓
B	✓	✗
C	✗	✓
D	✗	✗

key

✓ = needed

✗ = not needed

3. Nov/2020/Paper_12/No.10

Work is done.

Which physical quantity is transferred?

A distance

B energy

C force

D temperature

4. Nov/2020/Paper_12/No.11

To calculate the power produced by a force, the size of the force must be known.

What else needs to be known to calculate the power?

	the distance that the force moves the object	the time for which the force acts on the object
A	✓	✓
B	✓	✗
C	✗	✓
D	✗	✗

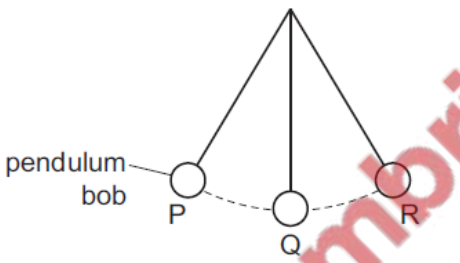
key

✓ = needed

✗ = not needed

5. Nov/2020/Paper_13/No.9

The diagram shows a frictionless pendulum.



The pendulum bob swings from point P through point Q to point R then back to P.

At which point is the energy of the pendulum bob greatest?

A at point P

B at point Q

C at point R

D it is the same at points P, Q and R

6. Nov/2020/Paper_13/No.11

To calculate the power produced by a force, the size of the force must be known.

What else needs to be known to calculate the power?

	the distance that the force moves the object	the time for which the force acts on the object
A	✓	✓
B	✓	✗
C	✗	✓
D	✗	✗

key

✓ = needed

✗ = not needed

7. Nov/2020/Paper_21/No.10

A stone is dropped from rest at a height of 2.0 m above the surface of a planet.

The planet has no atmosphere.

The speed of the stone just before reaching the surface of the planet is 3.8 m/s.

What is the acceleration of free fall on the planet?

A zero **B** 1.9 m/s^2 **C** 3.6 m/s^2 **D** 7.2 m/s^2

8. Nov/2020/Paper_21/No.11

An electric motor uses 1000 J of electrical energy. It provides 450 J of useful output energy.

What is the efficiency of the motor?

A 4.5% **B** 5.5% **C** 45% **D** 55%

9. Nov/2020/Paper_21/No.12

To calculate the power produced by a force, the size of the force must be known.

What else needs to be known to calculate the power?

	the distance that the force moves the object	the time for which the force acts on the object
A	✓	✓
B	✓	✗
C	✗	✓
D	✗	✗

key

✓ = needed

✗ = not needed

10. Nov/2020/Paper_22/No.10

A woman of mass 50 kg has 81 J of kinetic energy.

What is her speed?

A 1.3 m/s **B** 1.6 m/s **C** 1.8 m/s **D** 3.2 m/s

11. Nov/2020/Paper_22/No.12

To calculate the power produced by a force, the size of the force must be known.

What else needs to be known to calculate the power?

	the distance that the force moves the object	the time for which the force acts on the object
A	✓	✓
B	✓	✗
C	✗	✓
D	✗	✗

key

✓ = needed

✗ = not needed

12. Nov/2020/Paper_23/No.10

An object of mass 4.5 kg is travelling at 7.0 m/s.

How much kinetic energy does the object have?

A 16 J **B** 32 J **C** 110 J **D** 220 J

13. Nov/2020/Paper_23/No.12

To calculate the power produced by a force, the size of the force must be known.

What else needs to be known to calculate the power?

	the distance that the force moves the object	the time for which the force acts on the object
A	✓	✓
B	✓	✗
C	✗	✓
D	✗	✗

key

✓ = needed

✗ = not needed

14. Nov/2020/Paper_32/No.4(c)

(c) In the power station, a conveyor belt lifts coal from a coal supply to a furnace. An electric motor moves the conveyor belt. Fig. 4.1 shows this arrangement.

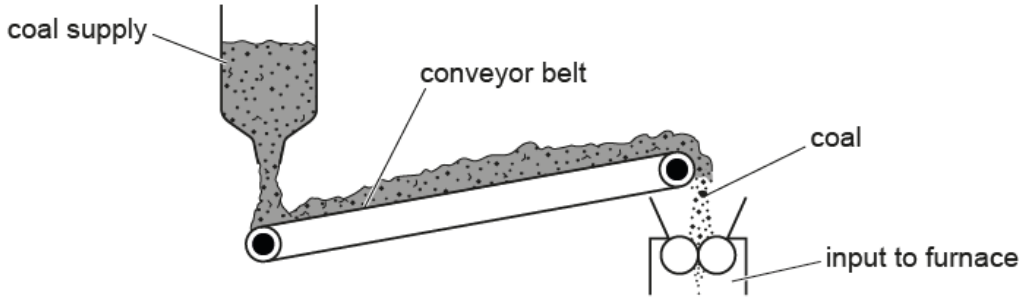


Fig. 4.1

The speed of the electric motor increases and the coal supply rate is increased. The conveyor belt lifts more coal each second. State the effect, if any, of increasing the motor speed on:

(i) the work done on each kilogram of coal

..... [1]

(ii) the output power of the motor.

..... [1]

15. Nov/2020/Paper_33/No.3

(a) A man lifts 40 blocks onto a platform, as shown in Fig. 3.1.

He lifts 10 blocks at once and does this four times.

A machine can lift 40 blocks at once onto the same platform, as shown in Fig. 3.2.

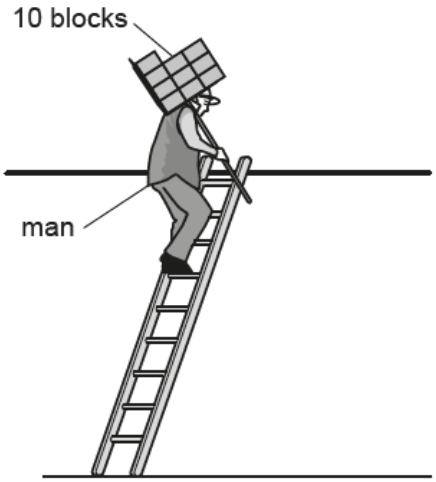


Fig. 3.1

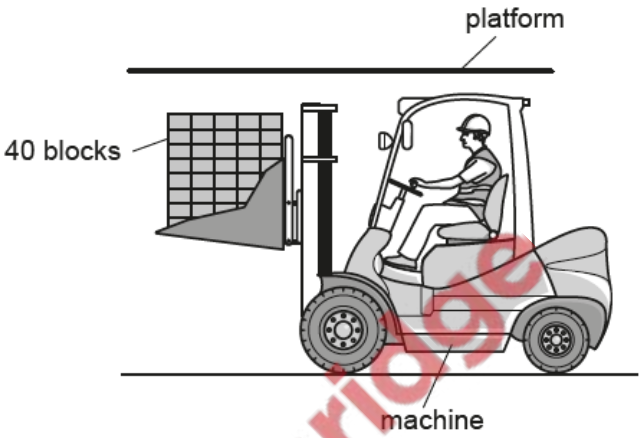


Fig. 3.2

(i) State the term used for energy gained by the blocks when they are lifted onto the platform.

..... [1]

(ii) State how the energy gained by 40 blocks when lifted by the man compares with the energy gained by 40 blocks when lifted by the machine.

.....

..... [1]

(b) Here are descriptions of four situations.

Indicate the situations in which work is done.

Put a tick (✓) in each correct box.

A child is sitting at the top of the stairs.	
A picture is hanging on a wall.	
A student is stretching a spring.	
A person is moving a chair.	

[1]

(c) Electrical appliances transfer energy. Some of the energy transferred is useful.

Draw a line from each electrical appliance to the correct useful energy output.

Only draw **three** lines.

electrical appliance	useful energy output
 torch	sound
 radio	light
 electric fan	chemical
	kinetic

[3]

[Total: 6]

16. Nov/2020/Paper_41/No.2(c)

(c) The metal ball has a mass of 2.1 g. It falls a distance of 0.80 m between being released and reaching the bottom of the tube.

(i) Calculate the gravitational potential energy transferred from the ball as it falls.

gravitational potential energy transferred = ... [2]

(ii) When the ball reaches the bottom of the tube, it has a speed of 1.2 m/s. Calculate the kinetic energy of the ball at the bottom of the tube.

kinetic energy = ... [3]

(iii) Explain why the value calculated in **(c)(i)** is different from that calculated in **(c)(ii)**.

.....

..... [1]

17. Nov/2020/Paper_42/No.3

The kinetic energy of air passing through a wind turbine every minute is 720 000 J. The electrical output of the turbine is 9.0 A at a potential difference (p.d.) of 240 V.

Calculate the efficiency (%) of the wind turbine.

efficiency = ... % [5]

18. Nov/2020/Paper_43/No.2(a)

Fig. 2.1 shows a cliff edge with water below it.

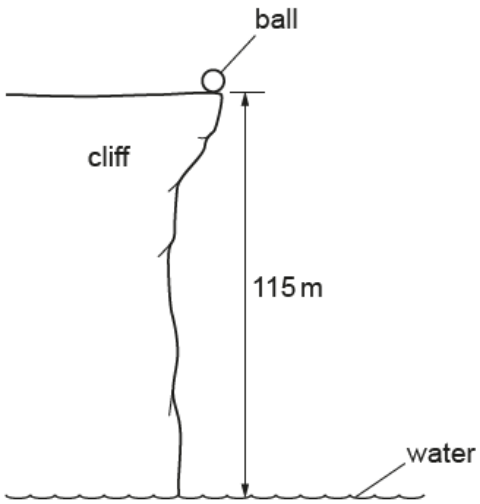


Fig. 2.1

A ball falls over the edge of the cliff. The mass of the ball is 160 g. The height of the cliff is 115 m.

(a) Calculate the vertical speed of the ball as it hits the water. Air resistance can be ignored.

speed = ... [3]