Learning Outcomes

- Motion, Motion graphs
- Forces, Moments, Momentum, Hookes law
- Density, Pressure
- Work, Energy, Power, Efficiency
- Electrical charge, current, resistance
- Electrical energy, power
- Waves

GCSE Physics

IAS Physics Rev T3.01
Revision Worksheet

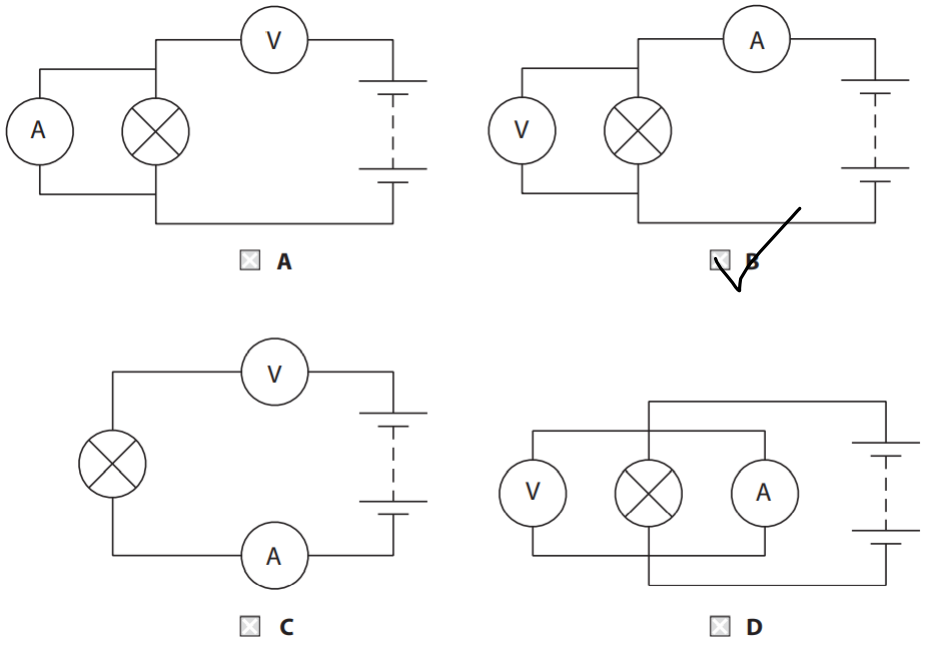
Name .....

Total marks :

Question 1 Ref : 2021 Homework > Term 2 > WS.03 > Q5.2 > Circuit & LDR Edexcel June 2017 5PH2F/01 P48802A Pp Q 4

A student experiments with filament lamps in a circuit.

(a) She starts with one lamp. Which of these circuits will let her measure the current in the circuit and the potential difference (voltage) across the lamp (1)



☒ A ☒ B ☒ C ☒ D

(b) The student finds that the current in the lamp is 0.80 A.

(i) Calculate the amount of charge that passes through the lamp in 4.0 minutes. (3)

192 columbs

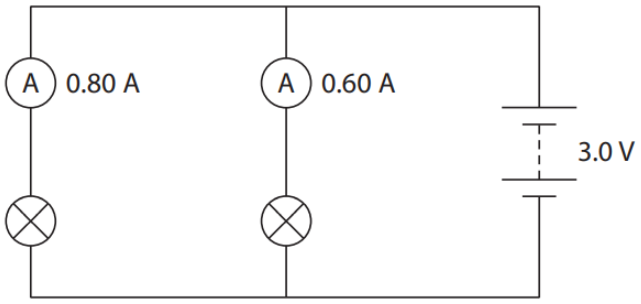
(ii) The student also finds that the potential difference across the lamp is 3.0 V.
Calculate the power of the lamp. (2)

2.4 W

(c) The student replaces the lamp in the circuit with a different one.
The current in this lamp is 0.60 A when the potential difference across it is 3.0 V.
State how the resistance of this lamp compares to the resistance of the first lamp. (1)

the resistance of this lamp is 5 ohms

(d) The student connects both lamps in parallel to the 3.0 V battery as shown in the diagram.



What is the size of the current in the battery? (1)

A 0.2 A **B** 0.7 A **C** 1.4 A **D** 1.8 A

(e) A filament lamp is one example of a component in a circuit.
A light-dependent resistor (LDR) can be another component in a circuit.
The student replaces one lamp in the circuit with a light-dependent resistor (LDR)
A light is shone on a light-dependent resistor (LDR) in a circuit.
Explain how this changes the current in the circuit. (2)

Question 2

Ref : 2021 NB Worksheets> Term 2 > WS.01 > Q1.1 > Work, Power, Energy, Efficiency

Exam Boards > Edexcel Exam & Revision Papers > IG Physics Edexcel Rev Papers **Previous** > Energy > Energy Transfers, GPE, KE & Efficiency 2 QP> Q 1

Some students carry out investigations with an electric motor.

(a) The students read the statement:
'All the energy supplied to the motor eventually ends up as thermal energy in the surroundings.'
This statement best describes the idea of

(1)

A renewable energy

B energy efficiency

C sustainable energy sources

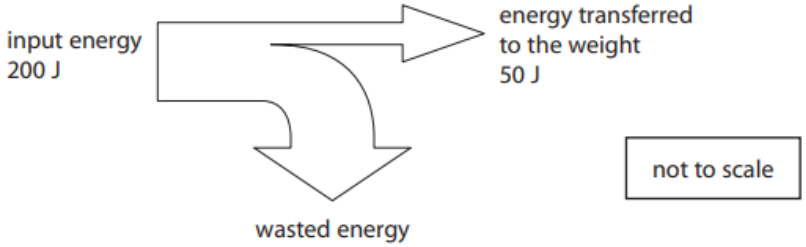
D conservation of energy

(b) The students use the electric motor to lift a weight. The current in the motor is 0.5 A.
The potential difference (voltage) across the motor is 6 V.
Calculate the input power to the motor. State the unit.

(3)

3W

(c) The diagram represents the energy transfers in the electric motor.



(i) How much energy is wasted?

(1)

150J

(ii) Calculate the efficiency of the motor.

(2)

25%

Question 3

Ref : 2021 NB Worksheets > Term 2 > WS.02 > Q1.1 > Work, Power, Energy, Efficiency

Exam Boards > Edexcel Exam & Revision Papers > IG Physics Edexcel Rev Papers **Previous** > Energy > Energy Sources 1 > Q 1

The International Space Station (ISS) has several solar panels called wings.

(a) The energy reaching the ISS from the Sun is carried by waves which are

(1)

A transverse and electromagnetic

B electromagnetic but not transverse

C transverse but not electromagnetic

D neither transverse nor electromagnetic

(b) In one second, the useful energy available from one wing is 34.3 kJ.
The energy incident on the wing from the Sun is five times this amount. What is the percentage efficiency of the wing?

(3)

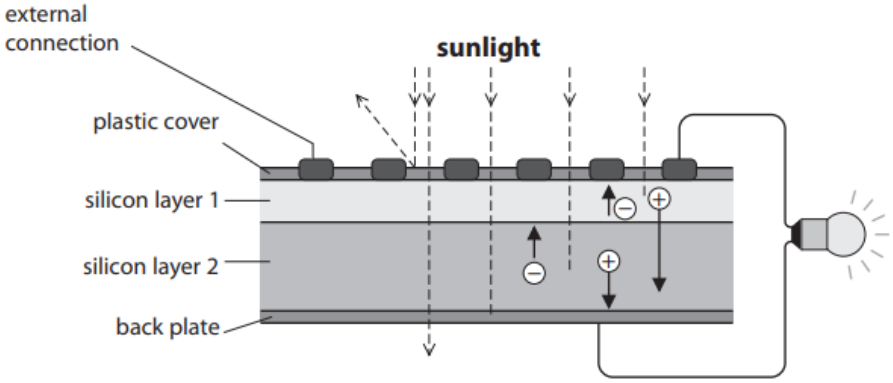
20%

(c) A wing is in direct sunlight. The ISS is not receiving energy from the wing.
The temperature of the wing remains constant.
Explain why the temperature of the wing remains constant in these conditions.

(2)

the temperature on the wing remains constant because energy from the sun is not absorbed by the wing and the temperature is not changing because there is nothing for the temperature to dissapate into.

(d) The diagram shows how a solar cell produces electricity when receiving energy from the Sun.
When energy from the Sun is absorbed in a silicon layer, it makes charges move.
This movement of charges produces a current.



Suggest two reasons why the efficiency of this solar cell at producing electricity from sunlight is less than 100%.

(2)

1. some of the energy from the Sun does not get absorbed into the silicon layer

2. some of the energy absorbed into the silicon turns into heat.

Question 4

Ref : 2021 Homework > Term 2 > WS.06 > Q3.1 > Materials > Hookes law

Ref : > Eam Boards> PMT > Edexcel > Exam & Rev Papers > GCSE Physics Exam & Rev Pprs > IG Physics Rev Pprs Previous > Hookes law QP > Hookes Law 1 > Q3

A student uses a digital calliper to measure the length of a spring, as shown in **Figure A.**

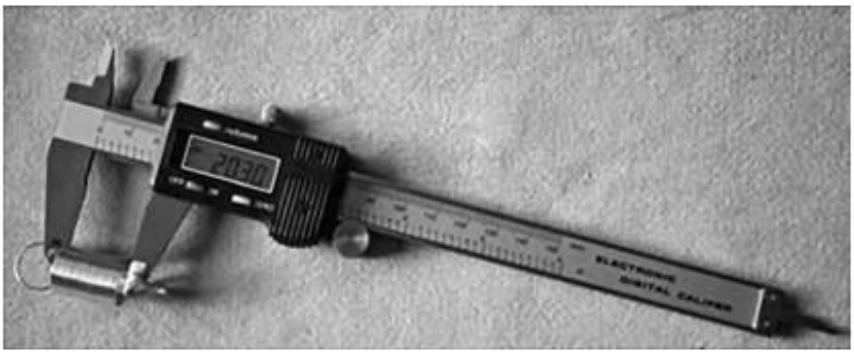


Figure A

The spring is bendy and difficult to measure. The student takes the six readings shown in **Figure B**.

Figure B

(a) Calculate the average length of the spring.

(2)

20.335

(b) The student investigates the stretching of a spring with the equipment shown in Figure C.

The student investigates the extension of the spring using six different weights. The results are shown in **Figure D**.

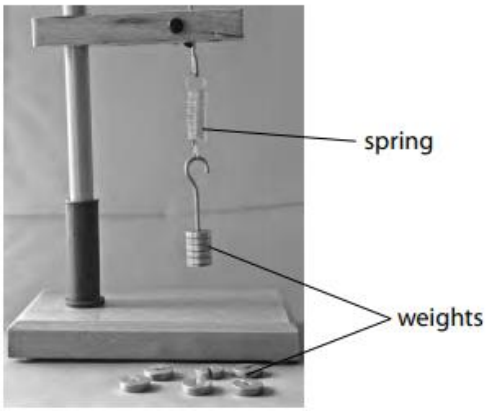
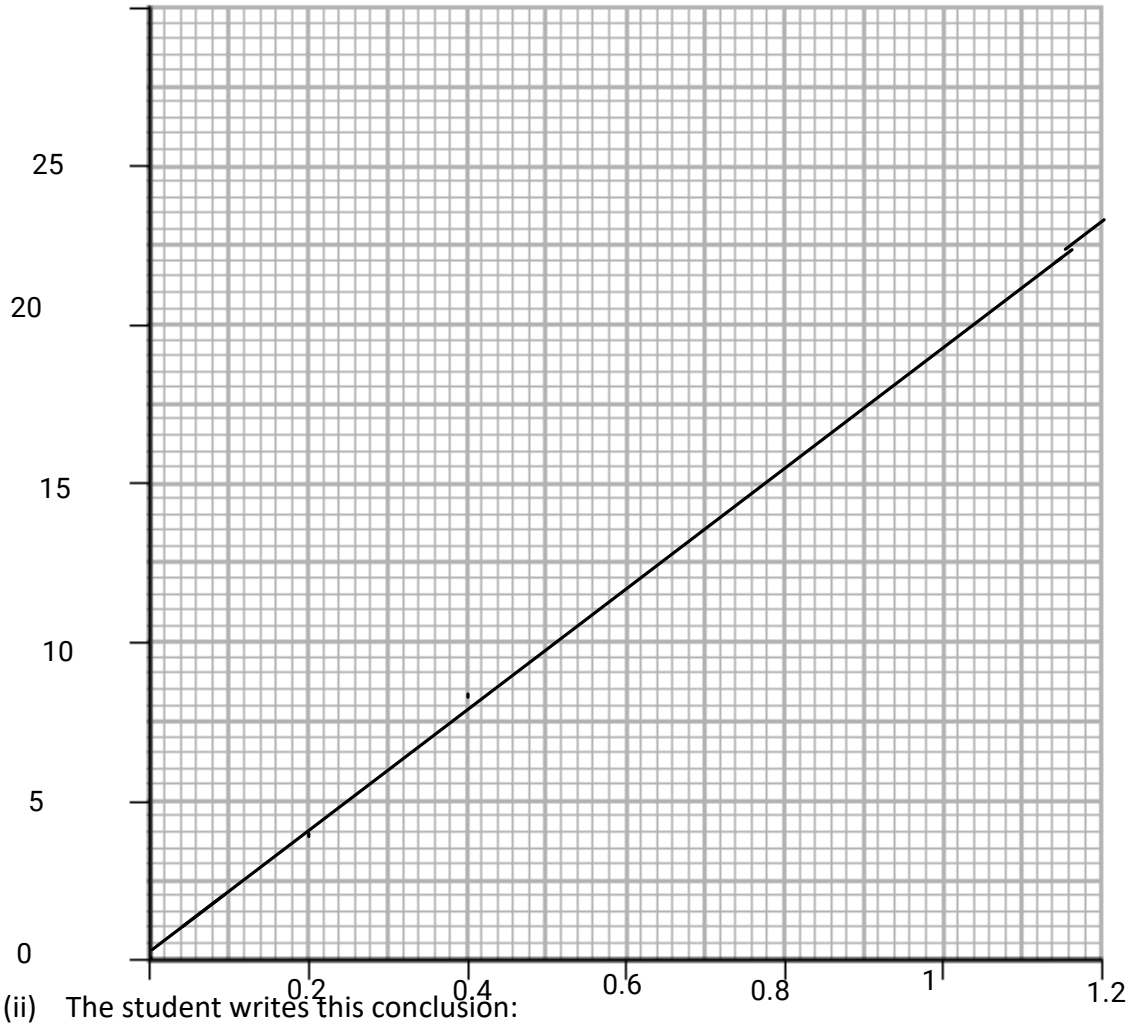


Figure C

Weight (N)	Extension (mm)
0.20	4.0
0.40	8.0
0.60	12.0
0.80	16.0
1.00	20.0
1.20	24.0

Figure D

(i) Draw a graph for the readings, using the grid shown. (3)



(ii) The student writes this conclusion:

'The extension of the spring is directly proportional to the weight stretching the spring.'

Comment on the student's conclusion.

(3)

I think that the conclusion is right, like the graph shows.

(c) The student extends the investigation by finding information about the stretching of wires.
The student finds the graph shown in **Figure E** for the stretching of a wire.

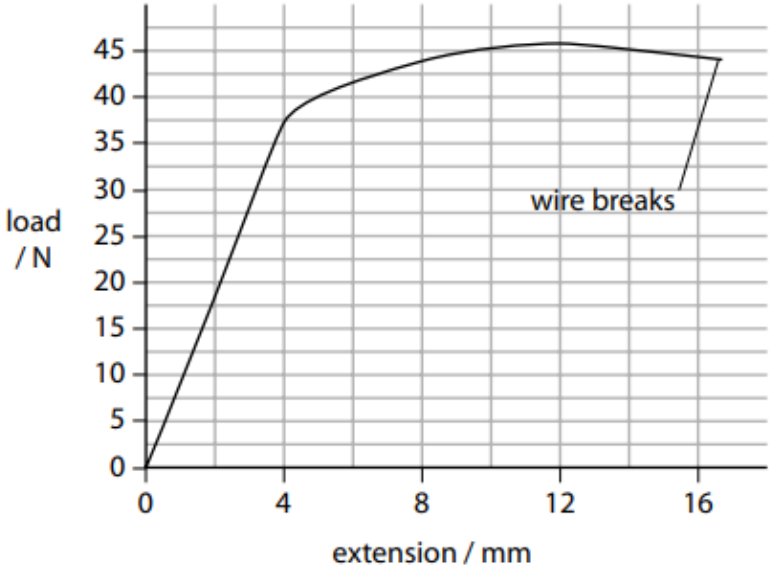


Figure E

Describe the non-linear stretching of the wire shown in **Figure E**.

(3)

up to 35 newtons, hookes law is used, but then the spring deforms and all patterns are lost

Question 5 Ref : 2021 Homework > Term 2 > WS.02 > Q3.1 > Materials > Density Edexcel June 2019 4PH1/1PR P60184A Pp 1PR Q6

The photograph shows a small glass ball used to investigate density and pressure.

(a) The mass of the ball is 19 g. The density of the ball is 2.3 g/cm^3 .

(i) State the formula linking density, mass and volume. (1)

density = mass/volume

(ii) Calculate the volume of the ball. (2)

8.2608695652 cm^3

(b) The ball is dropped into deep water and sinks to a depth of 560 cm.

(i) State the formula linking pressure difference, height, density and gravitational field strength. (1)

(ii) Calculate the increase in pressure at this depth. [density of water = 1000 kg/m^3] (2)

Question 6 Ref : 2021 Homework > Term 2 > WS.05 > Q3.1 > Materials > Density Edexcel January 2020 4PH1/2P P62043A Pp 1 Q2

The photograph shows a brass mass.

(a) State the formula linking density, mass and volume.

(1)

mass = density x volume

(b) The brass mass has a mass of 454 g.
The density of brass is 8.46 g/cm^3 .
Calculate the volume of the brass mass. Give the unit.

(3)

53.6643026005 cm^3

Question 7

Ref : 2021 Homework > Term 2 > NB WS.01 > Q1.5 > Materials > Pressure

Exam Boards > Edexcel Exam & Revision Papers > IG Physics Edexcel Rev Papers **Previous** > Particle Model > Q 4b

A student makes the following hypothesis:

'When I increase the pressure on a fixed mass of gas, the volume of the gas decreases.'

She has the equipment shown in Figure 1.

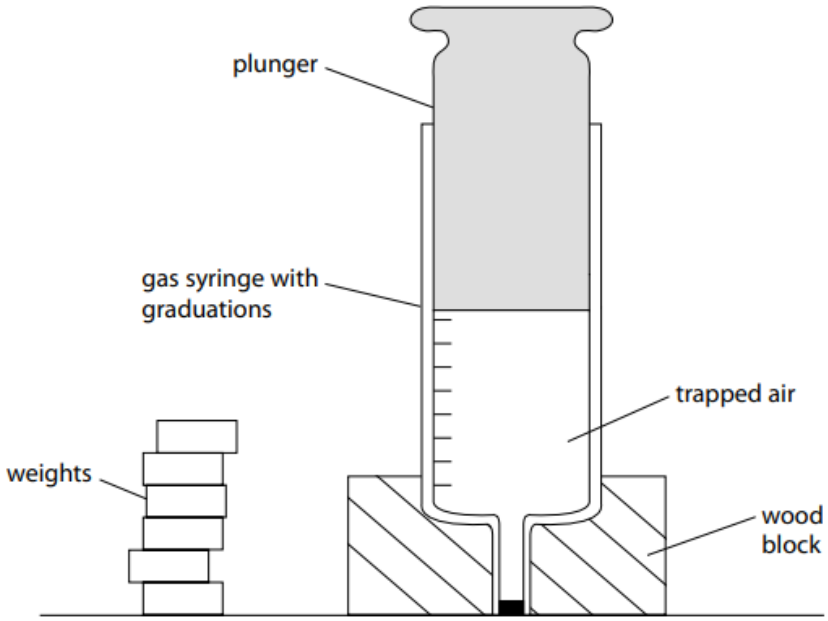


Figure 1

She measures the area of the plunger.
Devise a plan to test her hypothesis.

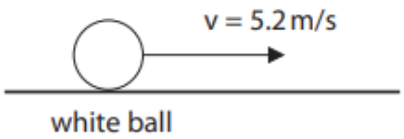
(4)

use the weights on the plunger to gradually increase the pressure on the gas, if the plunger goes down, then her hypothesis is correct.

Question 8 Ref : 2021 Homework > Term 2 > WS.02 > > Q2.1 > Momentum Edexcel June 2019 4PH1/2PR P60185A Pp 2PR Q7

A game is played on a table with balls of different colours.

(a) The diagram shows the white ball moving across a flat surface.



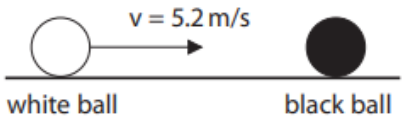
(i) State the formula linking momentum, mass and velocity. (1)

momentum = mass x velocity

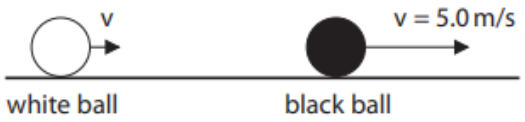
(ii) The white ball has a mass of 170 g. Calculate the momentum of the white ball. (2)

0.884 kgm/s

(b) The white ball collides with a stationary black ball.



before collision



after collision

(i) The black ball has a mass of 160 g.
After the collision, the black ball moves away from the white ball with a velocity of 5.0 m/s.
Calculate the velocity of the white ball after the collision. (4)

0.525 m/s

(ii) During the collision, the white ball exerts a force of 80 N on the black ball.
The direction of this force is to the right.
State the **magnitude** and **direction** of the force the black ball exerts on the white ball during the collision. (2)

Question 9 Ref : 2020 Solids Liquids Gases > Worksheets > WS5.01 > Q13 > Kinetic Theory March 2019(v2) 0625/42 Qp 4 Q7

(a) In Fig. 7.1, the small circles represent molecules. The arrows refer to the change of state from the arrangement of molecules on the left to the arrangement of molecules on the right.

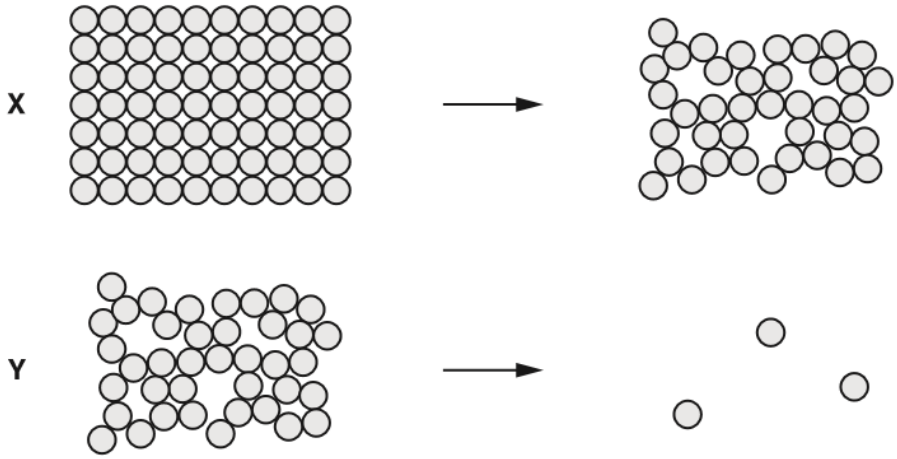


Fig. 7.1

Complete the following by writing solid, liquid or gas in each of the blank spaces.

1. Change of state **X** is from ..... to ..... .

2. Change of state **Y** is from ..... to ..... .

[2]

(b) Explain, in terms of the forces between their molecules, why gases expand more than solids when they undergo the same rise in temperature.

.....

.....

.....

..... [2]

(c) A cylinder of volume $0.012\,m^3$ contains a compressed gas at a pressure of $1.8 \times 10^6\,Pa$.
A valve is opened and all the compressed gas escapes from the cylinder into the atmosphere.

The temperature of the gas does not change.

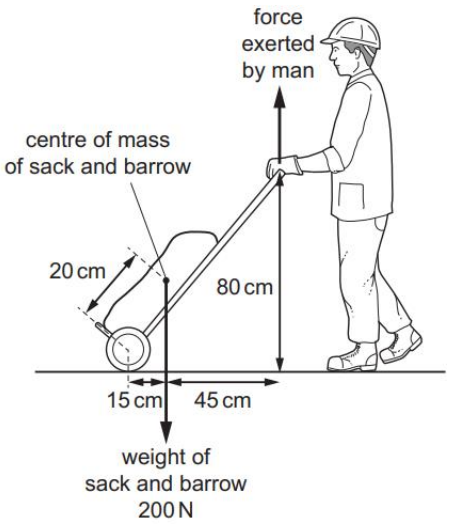
Calculate the volume that the **escaped** gas occupies at the atmospheric pressure of $1.0 \times 10^5\,Pa$.

volume = ... [3]

[Total: 7]

Question 10 Ref : 2021 Topic 1 DN T1.02 > > Q8 > Moments Physics June 2017(v3) 0625/23 Pp2 Q7

The diagram shows a man holding a sack and barrow stationary.
He applies a vertical force to the handle.
The centre of mass and the weight of the sack and barrow are shown. The wheel acts as a pivot.
What is the magnitude of the vertical force exerted by the man? (3)



Equations

(final velocity)^2 – (initial velocity)^2 = 2 × acceleration × distance $v^2 - u^2 = 2 \times a \times x$
energy transferred = current × potential difference × time $E = I \times V \times t$
potential difference across primary coil × current in primary coil = potential difference across secondary coil × current in secondary coil $V_p \times I_p = V_s \times I_s$
change in thermal energy = mass × specific heat capacity × change in temperature $\Delta Q = m \times c \times \Delta\theta$
thermal energy for a change of state = mass × specific latent heat $Q = m \times L$
$P_1 V_1 = P_2 V_2$ to calculate pressure or volume for gases of fixed mass at constant temperature
energy transferred in stretching = 0.5 × spring constant × (extension)^2 $E = ½ \times k \times x^2$