

PHYSICS

0625/22

Paper 2 Multiple Choice (Extended)

February/March 2019

45 minutes

Additional Materials: Multiple Choice Answer Sheet
Soft clean eraser
Soft pencil (type B or HB recommended)



READ THESE INSTRUCTIONS FIRST

Write in soft pencil.

Do not use staples, paper clips, glue or correction fluid.

Write your name, centre number and candidate number on the Answer Sheet in the spaces provided unless this has been done for you.

DO NOT WRITE IN ANY BARCODES.

There are **forty** questions on this paper. Answer **all** questions. For each question there are four possible answers **A, B, C** and **D**.

Choose the **one** you consider correct and record your choice in **soft pencil** on the separate Answer Sheet.

Read the instructions on the Answer Sheet very carefully.

Each correct answer will score one mark. A mark will not be deducted for a wrong answer.

Any rough working should be done in this booklet.

Electronic calculators may be used.

Take the weight of 1.0 kg to be 10 N (acceleration of free fall = 10 m/s^2).

So, we at our site have always been believing in providing data since lowermost years. With more unseen questions being introduced so that you may all score well. While recent years will give you a set of fresh questions too but earlier IGCSE questions provide a wealth of resources to score your grades and get you closer to your A stars!!!!

This syllabus is regulated for use in England, Wales and Northern Ireland as a Cambridge International Level 1/Level 2 Certificate.

This document consists of **15** printed pages and **1** blank page.

- 1 Which row shows the best choice of measuring instruments to obtain accurate values for the distances shown?

	diameter of wire	height of bench	length of laboratory
A	measuring tape	measuring tape	micrometer screw gauge
B	metre rule	micrometer screw gauge	measuring tape
C	micrometer screw gauge	measuring tape	metre rule
<input checked="" type="checkbox"/>	micrometer screw gauge	metre rule	measuring tape

This is a basic concept based question and hence needs no explanation. Learn your concepts well.

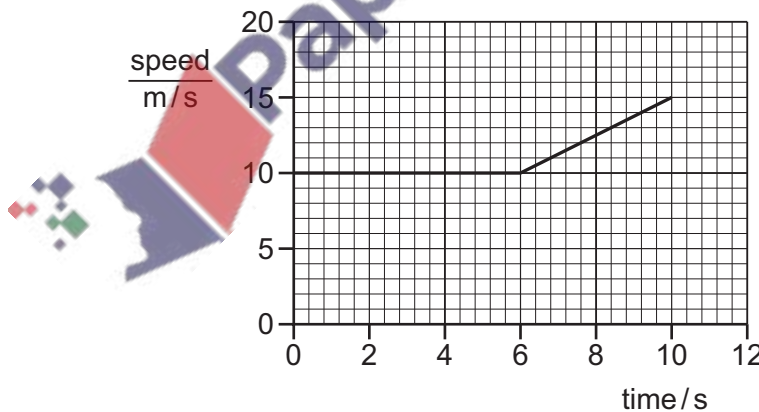
- 2 An object is moving with uniform deceleration.

Which statement describes its motion?

- A** Its rate of change of speed is decreasing.
B Its speed is constant.
☒ **C** Its speed is decreasing.
D Its speed is increasing.

Meaning of deceleration is itself decreasing speed

- 3 The graph shows how the speed of a car varies during part of its journey.



acceleration = Slope of the graph
 hence = $(15 - 10) / (10 - 6)$
 $= 5/4$
 $= 1.25 \text{ m/s}^2$

What is the value of the car's acceleration between 6 s and 10 s?

- A** 0.50 m/s^2 **B** 0.80 m/s^2 ☒ **C** 1.25 m/s^2 **D** 1.50 m/s^2

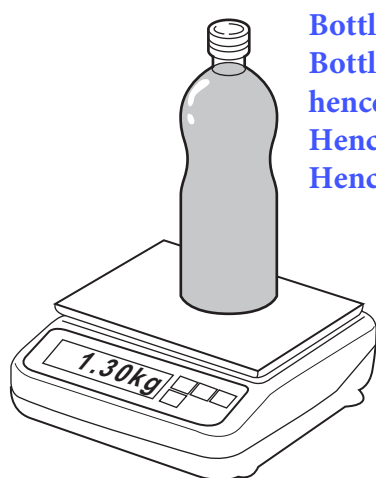
- 4 The gravitational field strength on the Moon is less than on the Earth.

Which of these is **different** when done on the Moon compared with when done on the Earth?

- ☒ **A** the gravitational potential energy gained by a stone lifted through the same vertical height
B the kinetic energy gained by a ball when hit with the same force for the same period of time
C the momentum gained by a bullet when fired from the same gun
D the work done in accelerating a stone from rest to the same speed
- $gpe = m \times g \times h$
 and since 'g' is different
 hence gpe will also be different

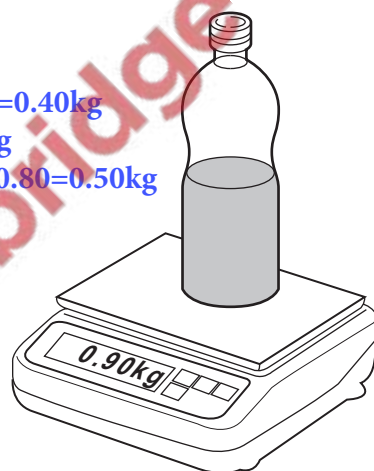
- 5 The mass of a full bottle of cooking oil is 1.30 kg.

When exactly half of the oil has been used, the mass of the bottle plus the remaining oil is 0.90 kg.



Bottle + oil = 1.30 kg
 Bottle + half of oil = 0.90 kg
 hence half bottle oil used = $1.30 - 0.90 = 0.40 \text{ kg}$
 Hence mass of only oil = $0.4 \times 2 = 0.80 \text{ kg}$
 Hence mass of empty bottle = $1.30 \text{ kg} - 0.80 = 0.50 \text{ kg}$

Note : Exactly the same
 question was asked in
 0625_s07_qp_1.pdf as q no:5



What is the mass of the empty bottle?

- A** 0.40 kg ☒ **B** 0.50 kg **C** 0.65 kg **D** 0.80 kg

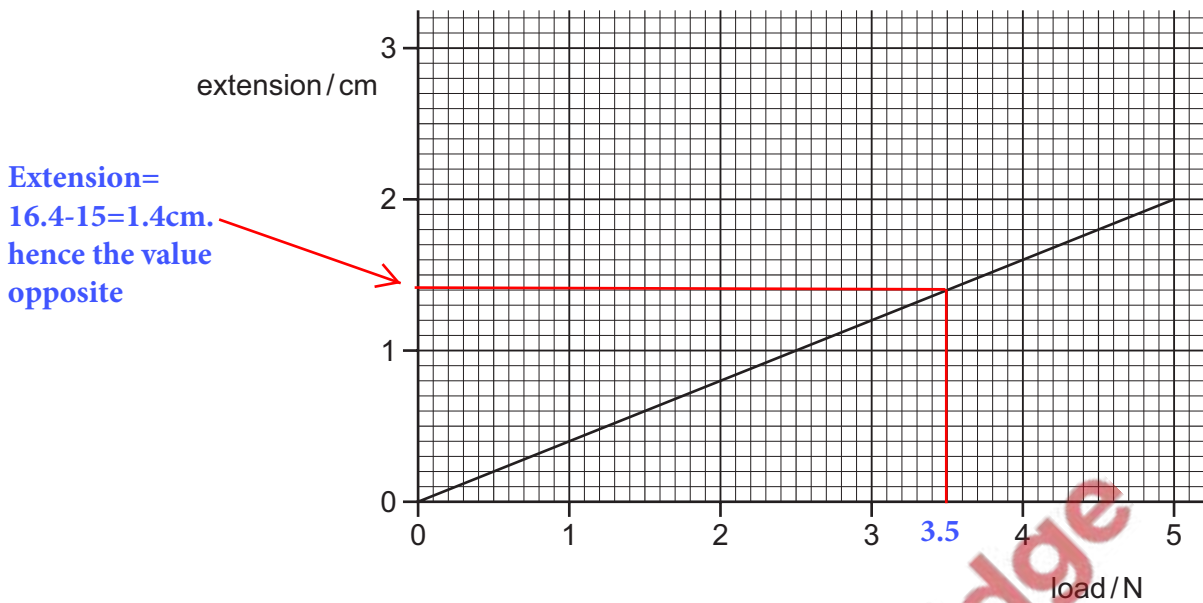
- 6 A solid ball has a volume of 4.0 cm^3 . The density of the ball is 1.6 g/cm^3 .

What is the mass of the ball?

- A** 0.4 g **B** 2.5 g **C** 4.0 g ☒ **D** 6.4 g

Mass = Density X Volume
 = 1.6×4
 = 6.4 g/cm^3

- 7 The extension/load graph for a spring is shown. The unstretched length of the spring is 15.0 cm.



When an object of unknown weight is suspended on the spring, the length of the spring is 16.4 cm.

What is the weight of the object?

- A 0.55 N B 0.67 N ☒ C 3.5 N D 4.1 N

- 8 A box of mass 2.0 kg is pulled across the floor by a force of 6.0 N.

The frictional force acting on the box is 1.0 N.

$$a = F/m \\ = (6-1)/2 \\ = 2.5 \text{ m/s}^2$$

Frictional force has been subtracted as it always opposes motion of objects

What is the acceleration of the box?

- A 0.40 m/s^2 ☒ B 2.5 m/s^2 C 3.0 m/s^2 D 3.5 m/s^2

- 9 Which moving body has a resultant force acting on it?

- A a diver rising vertically through water at constant speed
☒ B an aircraft circling an airport at constant speed
 C a train going up a straight incline at constant speed
 D a parachutist descending vertically at terminal velocity

The resultant force on all objects going around in circles is directed towards the centre of the circle.

- 10 A constant force acts on a body causing the momentum of the body to increase.

Which expression relates the force to the momentum and the time taken?

☒ A force = $\frac{\text{change in momentum}}{\text{time taken}}$

There is a change in momentum, hence impulse therefore:

$ft = \text{change in momentum}$

or force = change in momentum/time

B force = $\frac{\text{momentum}}{\text{time taken}}$

C force = change in momentum \times time taken

D force = momentum \times time taken

- 11 A car of mass 1500 kg has a speed of 20 m/s. It accelerates until its speed is 25 m/s.

Increase in ke = $(0.5 \times 1500 \times 25^2) - (0.5 \times 1500 \times 20^2)$

What is the increase in the kinetic energy of the car? = 168750 = approx = 170000 J or 170 kJ

A 19 kJ

B 38 kJ

☒ C 170 kJ

D 340 kJ

- 12 Which source of energy uses the production of steam to generate electrical energy?

A hydroelectric

The heat generated in the nuclear power stations is used to change

☒ B nuclear

water into steam and this steam then runs the turbines to generate

C tides

electricity. The other options mentioned in the question directly turn

D waves

the turbines connected to generators to generate electrical energy

- 13 A car, travelling on a straight horizontal road, has 1.6 MJ of kinetic energy. It accelerates for 20 s until it has 2.5 MJ of kinetic energy.

Note: $1 \text{ W} = 1 \text{ J/s}$

$1 \text{ J} = 10^6 \text{ J}$

$P = [(2.5 - 1.6) \times 10^6] / 20$

$= 0.045 \times 10^6 \text{ J/s}$

$= 45000 \text{ J/s}$

or 45 kW

What is the average power output used to increase the kinetic energy of the car?

A 45 W

B 205 W

☒ C 45 kW

D 205 kW

- 14 Which diagram shows an athlete exerting least pressure on the ground?

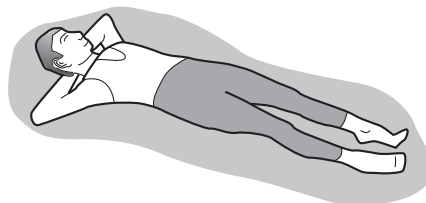
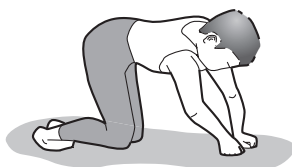
A

☒ B

C

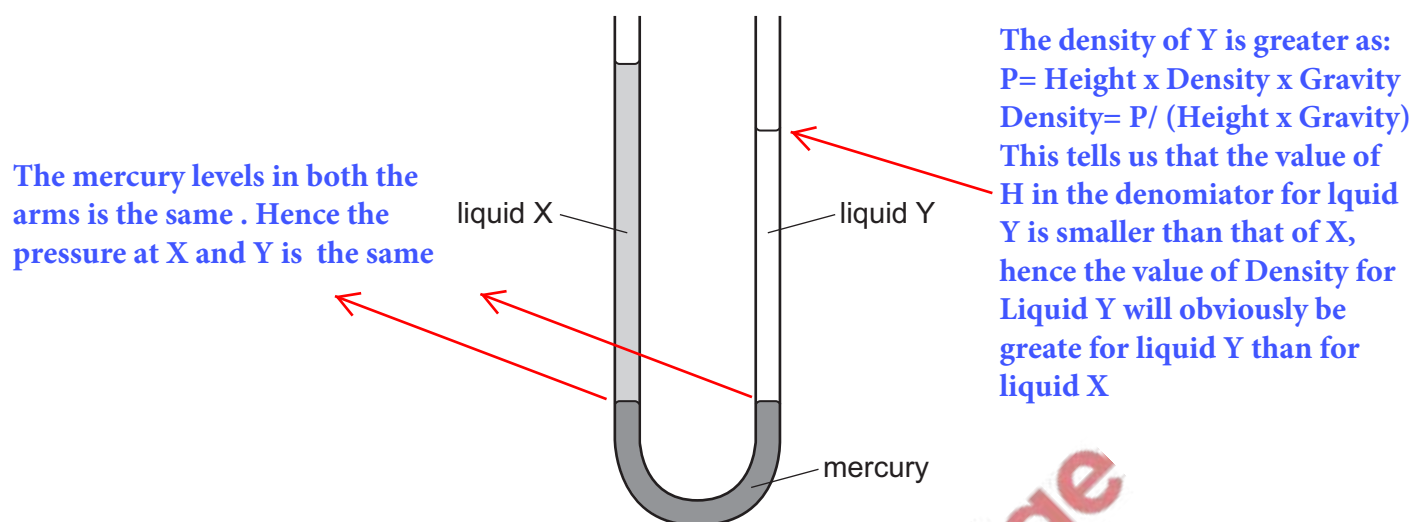
D

Note : Exactly the same question was asked in 0625_w03_qp_1.pdf as q no:12



When a person lies down, his entire weight and hence the force is spread out over a large surface area. Resultantly the pressure exerted by him on the ground decrease.

- 15 The diagram shows a U-tube manometer containing three liquids: mercury, liquid X and liquid Y. Neither liquid X or liquid Y mixes with mercury.



Which row compares the pressure exerted by liquid X and by liquid Y on the mercury, and the density of liquid X and the density of liquid Y?

	pressure exerted by X and by Y on the mercury	densities of X and of Y
A	pressure of X is greater than Y	density of X is greater than Y
B	pressure of Y is greater than X	density of Y is greater than X
C	pressure of X and of Y is the same	density of X is greater than Y
<input checked="" type="checkbox"/>	pressure of X and of Y is the same	density of Y is greater than X

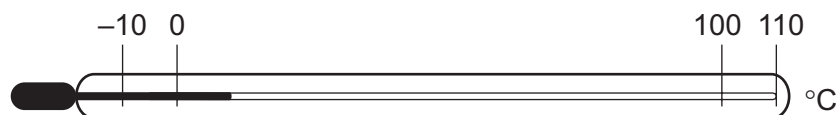
- 16 Gas molecules exert a pressure when they collide with the walls of a container.

Which statement is correct?

- A** They experience a change in force which exerts a pressure equal to $\frac{\text{momentum}}{\text{area}}$ on the walls.
- B** They experience a change in force which exerts a pressure equal to $\frac{\text{momentum}}{\text{area}}$ on the walls.
- C** They experience a change in momentum which exerts a pressure equal to $\frac{\text{force}}{\text{area}}$ on the walls.
- ☒ They experience a change in momentum which exerts a pressure equal to $\frac{\text{force}}{\text{area}}$ on the walls.

When gas molecules collide, their velocities change and hence there is a change in their momentum and a pressure = force/area is exerted on the walls of the container.

- 17 A thermometer has graduations which start at -10°C and end at 110°C .



What is the lower fixed point and what is the upper fixed point of the Celsius scale?

	lower fixed point / $^{\circ}\text{C}$	upper fixed point / $^{\circ}\text{C}$
A	-10	100
B	-10	110
<input checked="" type="checkbox"/> C	0	100
D	0	110

Note : Exactly the same question was asked in 0625_m15_qp_12.pdf as q no:15

Always a thermometer scale starts at 10 degree below the lower fixed point and ends at 10 degree above the upper fixed point

- 18 A 1 kg block of aluminium requires more thermal energy to raise its temperature by 1°C than a 1 kg block of copper requires.

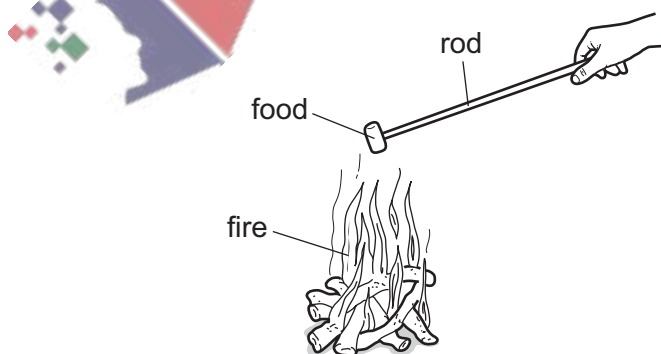
Why is this?

- A Aluminium is a better conductor of thermal energy than copper.
 B Aluminium is a poorer conductor of thermal energy than copper.
☒ C Aluminium has a higher specific heat capacity than copper.
 D Aluminium has a lower specific heat capacity than copper.

This is the basic definition of the term specific heat capacity. Please learn your concepts/definitions well.

- 19 Four campers are warming their food on a fire.

They use different rods, each of the same dimensions, to hold their food near the fire.



Which material is the best choice to prevent their hands from getting too hot?

- A aluminium
 B copper
 C steel
☒ D wood

Aluminium, copper and steel are metals and hence are good conductors of heat while wood is a bad conductor of heat.

- 20 Two metal cans are identical, except that one has a shiny silver outer surface and the other has a dull black outer surface. They each have 300 g of water at 80 °C sealed inside them. They are both in a vacuum, in the darkness of outer space.

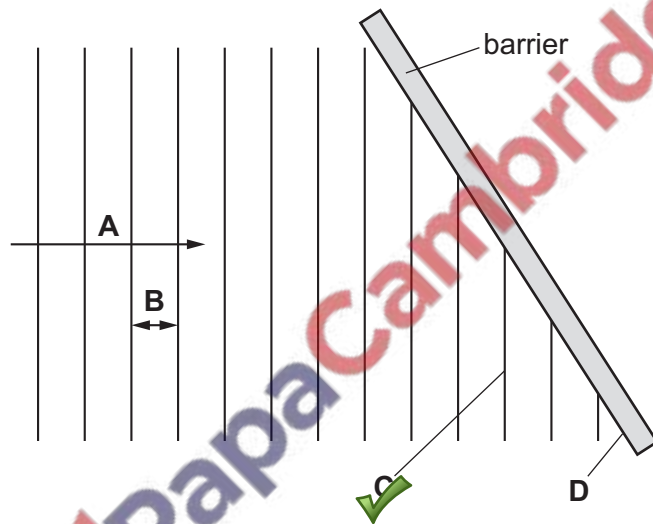
How does the temperature of the water in each one change?

- A Neither one will cool down.
 B The water in the black can cools more slowly than that in the shiny can.
 ✓ C The water in the shiny can cools more slowly than that in the black can.
 D They both cool down at the same rate.

This is because black matt surfaces are good emitters as well good absorbers of infra red radiations. So black container will allow heat to be lost fast .

- 21 The diagram shows a wave before it reflects from a barrier.

Which labelled section of the diagram represents a wavefront?



The vertical lines approaching a barrier are always the wavefronts

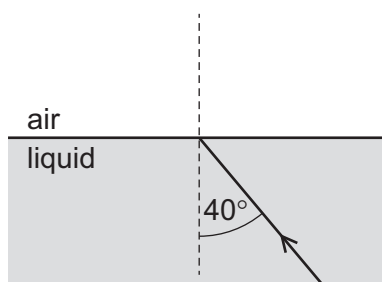
- 22 A vibrating object produces ripples on the surface of a liquid. The object completes 20 vibrations every second. The spacing of the ripples, from one crest to the next, is 3.0 cm.

What is the speed of the ripples?

- A 0.15 cm/s B 6.7 cm/s ✓ C 60 cm/s D 120 cm/s

One vibration produces 20 ripples. And 20 ripples will contain 10 Crest-Crest distances
 One Crest-Crest distance = 3 cm. So 10 crest crest distance = 30 cm
 $\text{speed} = \text{distance} / \text{time}$
 $= 30 \text{ cm} / 1 \text{ second} = 30 \text{ cm/s}$

- 23 A narrow beam of light is travelling through a transparent liquid. It meets the surface as shown, at an angle of incidence of 40° . The refractive index of the liquid is 1.5.



$$\text{Refractive Index} = \frac{\sin i}{\sin r}$$

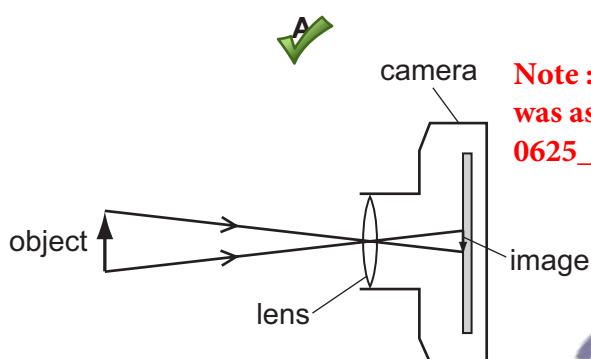
$$1.5 = \frac{\sin 40}{\sin r}$$

$$r = \sin^{-1}(\sin 40 / 1.5) = 75$$

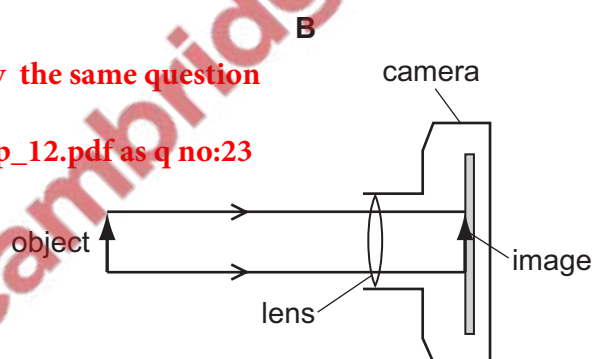
What is the angle of refraction as the light enters the air?

- A 25° B 27° C 60° **D 75°**

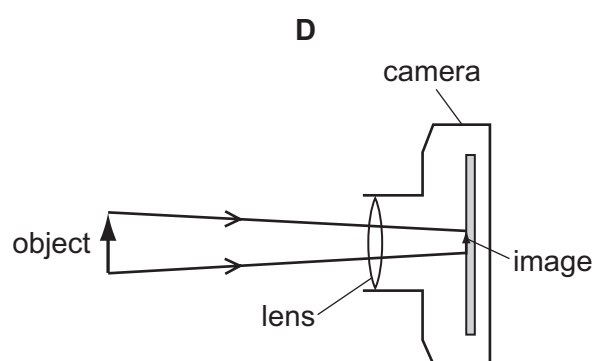
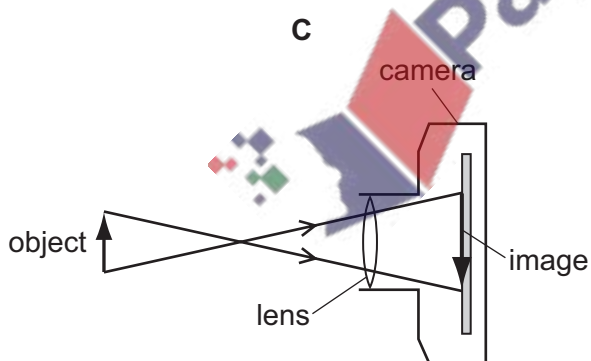
- 24 Which diagram correctly represents rays of light passing through a converging lens in a camera?



Note : Exactly the same question was asked in 0625_m13_qp_12.pdf as q no:23



The rays converge at the lense and the image size is smaller than the object size



- 25 What is the speed of X-rays in a vacuum and in air?

	in a vacuum	in air
A	$3.0 \times 10^6 \text{ m/s}$	$2.0 \times 10^6 \text{ m/s}$
B	$3.0 \times 10^6 \text{ m/s}$	$3.0 \times 10^6 \text{ m/s}$
C	$3.0 \times 10^8 \text{ m/s}$	$2.0 \times 10^8 \text{ m/s}$
D	$3.0 \times 10^8 \text{ m/s}$	$3.0 \times 10^8 \text{ m/s}$

All electromagnetic waves travel in air and vacuum at the speed of light = $3 \times 10^8 \text{ m/s}$

- 26 A sound wave passes a point. The air pressure at that point increases and then decreases 300 times every second.

Which descriptions apply to this sound wave?

	the type of wave motion	the frequency of the sound
A	longitudinal	outside human hearing range
<input checked="" type="checkbox"/> B	longitudinal	within human hearing range
C	transverse	outside human hearing range
D	transverse	within human hearing range

Sound waves are always longitudinal waves. Also the frequency is 300Hz which is within the range of audible frequency which is 20Hz to 20000Hz

- 27 A boy stands 150m from a wall. He claps and when he hears the echo, he immediately claps again. He continues this for some time.

Another student has a stop-watch. She starts the watch on the first clap and stops it on the eleventh clap. The watch reads 10.0 s.

Which value do her measurements give for the speed of sound in air?

- A** 150 m/s **B** 170 m/s ☒ **C** 300 m/s **D** 330 m/s

Total claps=10

Time taken for 10 claps = 10 s

Time per clap = $10/10=1\text{s}$

Total distance = 150

Formula involving echo :

$$\text{Speed} = (2d) / t$$

$$= 2 \times 150 = 300\text{m/s}$$

- 28 The ends of three metal rods are tested by holding end Q of rod 1 close to the others in turn.

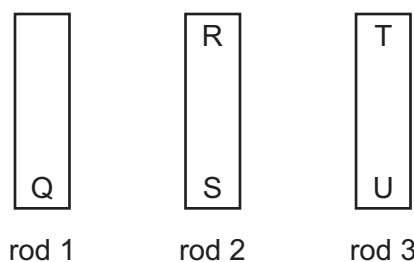
The results are as follows.

End Q attracts end R.

End Q attracts end S.

End Q attracts end T.

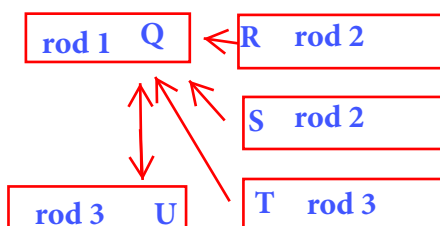
End Q repels end U.



Note : Exactly the same question was asked in 0625_w06_qp_1.pdf as q no:26

Which of the metal rods is a magnet?

- A** rod 1 only
B rod 1 and rod 2
☒ **C** rod 1 and rod 3
D rod 3 only



Repulsion \longleftrightarrow
Attraction: \longleftarrow

Note:

Q attracts R, S and T, and at the same time repels the pole opposite to T. This can only happen if North and South poles are present on the rod 3 as well as rod 1 and hence rod 1 and 3 are magnets as like poles repel and unlike poles attract

29 A metal sphere is charged by induction. There are four stages W, X, Y and Z in this process.

W a charged rod is brought near to the sphere

X the sphere is earthed

Y the charged rod is taken away from the sphere

Z the earth connection is removed

In which order are the four stages carried out?

A $W \rightarrow X \rightarrow Y \rightarrow Z$

☒ B $W \rightarrow X \rightarrow Z \rightarrow Y$

C $Z \rightarrow W \rightarrow X \rightarrow Y$

D $X \rightarrow Z \rightarrow W \rightarrow Y$

These are the basic concepts involved in charging metal spheres by induction. Learn your concepts well.

30 Which electrical quantity is defined in terms of the energy supplied in driving charge round a complete circuit?

A current

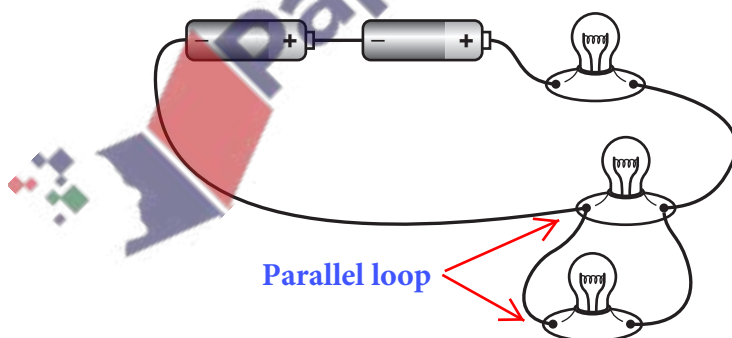
☒ B electromotive force

C potential difference

D power

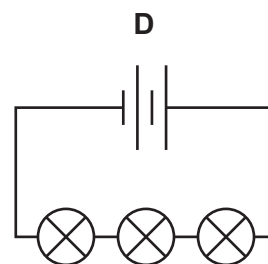
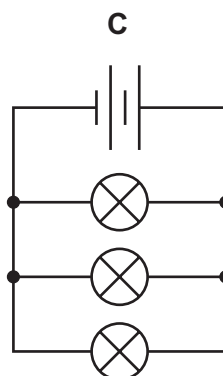
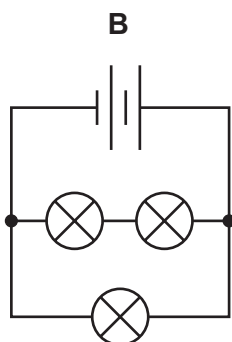
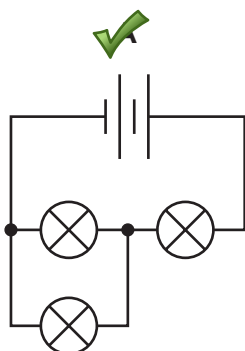
This is the basic definiyoon of an emf. Learn your concepts well

31 A student sets up a circuit containing a battery of two cells and three lamps, as shown.



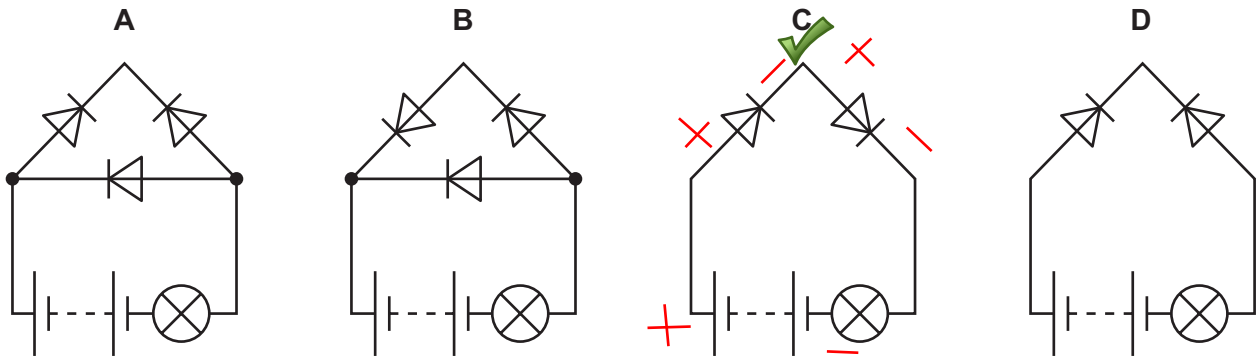
Note : Almost similar question was asked in 0625_w09_qp_1.pdf as q no:0

What is the circuit diagram for this arrangement?



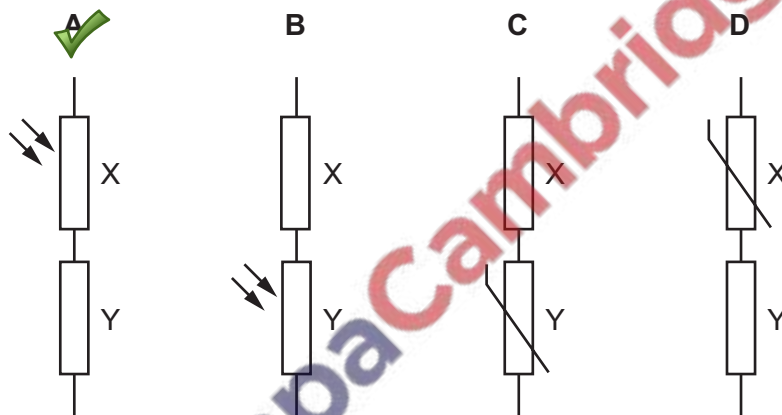
32 In which circuit does the lamp light?

Note: Always the positive should be connected to the negative for a circuit to function



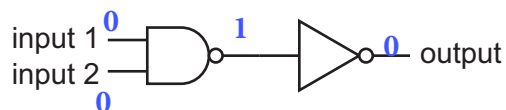
33 Each potential divider is placed in a circuit with a power supply.

Which potential divider makes the potential difference across component Y increase when the light intensity increases?



When light intensity increases, its resistance will decrease and at the same time the potential across it will also decrease. As a result the potential across component Y will increase. This is because the two components are in series and hence as per the rules of the series circuit, the battery potential will be shared among them.

- 34 There are two inputs to the combination of logic gates shown, and one output.



Which truth table represents the action of this combination of gates?



input 1	input 2	output
0	0	0
0	1	0
1	0	0
1	1	1

B

input 1	input 2	output
0	0	0
0	1	1
1	0	1
1	1	1

Basic concept of
working of gates.
Learn your concept
well

C

input 1	input 2	output
0	0	1
0	1	1
1	0	1
1	1	0

D

input 1	input 2	output
0	0	1
0	1	0
1	0	0
1	1	0

- 35 The current in a kettle is 10 A and the kettle is protected by a 13 A fuse.

The owner of the kettle replaces the 13 A fuse with a 3 A fuse.

What happens when the kettle is switched on?

- A** The fuse melts and the kettle might be damaged.
- B** The fuse melts and the kettle is undamaged.
- C** The fuse does not melt and the kettle works correctly.
- D** The fuse does not melt but the kettle fails to work.

The 3 A fuse does not let any current higher than 3 A pass though the kettle. Hence at 3 A the fuse will melt and the kettle will be undamaged.

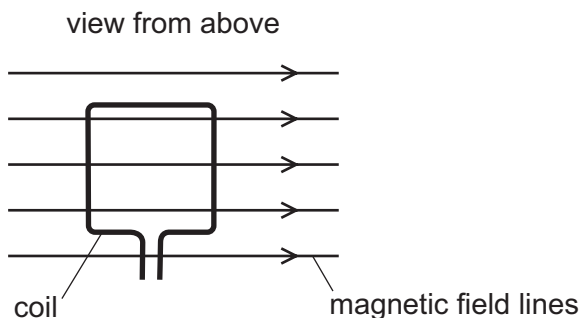
- 36 Which statement about the direction of a magnetic field at a point is correct?



- A** It is the direction of the force on a north pole placed at that point.
- B** It is the direction of the force on a south pole placed at that point.
- C** It is the direction of the force on a positive charge placed at that point.
- D** It is the direction of the force on a negative charge placed at that point.

Basic concept of
magnetic field
Learn your concept
well

37 A current-carrying coil is placed in a magnetic field.



Any current carrying coil will experience a force in a magnetic field. This is because a magnetic field exists around any current carrying conductor. This field interferes with the magnetic field in which it is placed and hence the conductor (in this case a coil) experiences a force on it

Which effect does the coil experience?

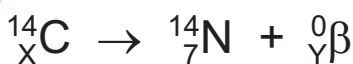
- A a change in shape
- B a change in weight
- C a resultant force
- ☒ D a turning effect

38 What are isotopes of an element?

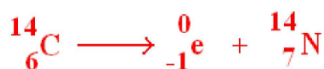
- A atoms of a different element with a different number of neutrons
- B atoms of a different element with a different number of protons
- ☒ C atoms of the same element with a different number of neutrons
- D atoms of the same element with a different number of protons

This is the basic definition of an isotope

39 A radioactive isotope of carbon ^{14}C decays by beta emission to give an isotope of nitrogen ^{14}N and a beta particle. The equation for the reaction is shown.



What is the value of X and of Y?



	X	Y
<input checked="" type="checkbox"/> A	6	-1
B	6	1
C	8	-1
D	8	1

In a beta decay, a beta particle which is nothing but an electron is emitted.

The charges on both sides must balance

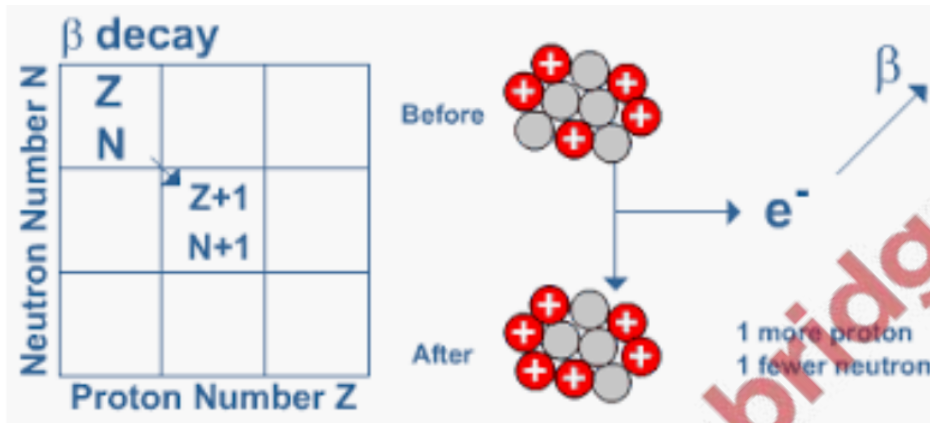
Hence $X = 7 + (-1)$

Hence $X = 6$ and $Y = -1$

40 A beta particle is a fast moving electron.

Which statement explains how beta particles are emitted from an atom?

- A An electron is emitted as a beta particle from an inner electron shell of the atom.
- B An electron is emitted as a beta particle from an outer electron shell of the atom.
- ✓ C A neutron changes into a proton and a beta particle is emitted from the nucleus.
- D A proton changes into a neutron and a beta particle is emitted from the nucleus.



Again its a basic concept of radioactivity. So learn your concepts well.