MARKER CODE

Student Personal Identification Number

SOLOMON ISLANDS NATIONAL FORM SIX CERTIFICATE

PHYSICS

2018

QUESTION and ANSWER BOOKLET

THURSDAY 8th NOVEMBER 2:00 PM TIME: 3 Hours plus 10 Minutes Reading Time.

INSTRUCTIONS

1. In addition to this Question and Answer Booklet you should also have a **PHYSICS EQUATION SHEET (No. 9/2)**.
2. This paper consists of TWO (2) sections: Sections A and B. Both sections are compulsory.

Section A: 160 marks 135 minutes

- Answer ALL questions.
- There are TEN (10) Questions worth 16 marks each.
- Write your answers in the spaces provided in this Booklet.
- Marks are awarded for working, so show your calculations clearly.

Section B: 40 marks 45 minutes

- There are TWENTY (20) Multiple Choice Questions each worth 2 marks.
- Write your answers in this section on the foldout flap at the back of this booklet.

If you are unable to calculate a value for a question and you need that value in a later question, select a convenient value and use it where needed.

3. Write your Student Personal Identification Number (SPIN) in the box on the top right hand corner of this page and on the fold-out flap at the back of this booklet.
4. Do NOT use correction fluid.
5. Mobile phones are NOT allowed in the Examination room.
6. Check that this booklet contains pages **2-47** in the correct order and that none of the pages is blank except for pages **45** and **46** have been left blank deliberately.

YOU MUST HAND THIS BOOKLET TO THE SUPERVISOR AT THE END OF THE EXAMINATION.

TOTAL MARKS | 200

SECTION A: (160 MARKS)

ATTEMPT ALL QUESTIONS IN THIS SECTION.
WRITE THE ANSWER TO EACH QUESTION IN THE SPACE PROVIDED FOR THE QUESTION.
IF YOU ARE NOT ABLE TO CALCULATE A VALUE FOR A QUESTION AND YOU NEED THAT VALUE IN A LATER QUESTION, SELECT A CONVENIENT VALUE AND USE IT WHERE NEEDED. Use $g = 9.81\ m/s^2$.where required.

QUESTION 1. [16 marks]

A. Elizabeth is experimenting with **curved mirrors.** She places a lighted candle between the **concave** mirror and the focal point to obtain an image on a screen.

State the nature (real or virtual) and the orientation (upright or inverted) of the image.

(i) Nature: ____

(1 mark)

Orientation: ____

(1 mark)

The image of the candle is formed 25.0 cm from the mirror. The focal length of the mirror is 16.0 cm. The height of the image is 0.50 cm.

Calculate the **distance** of the object from the mirror and the **height** of the object.

(ii) Distance

Distance=_____________cm

(2 marks)

Height of object

Height = ______________cm

(2 marks)

(iii) Elizabeth then placed the candle in front of a **convex mirror**.
Explain why she was unable to get an image of the candle on a screen.

____

____

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(2 marks)

B. Tom uses a convex lens as a magnifying glass. He puts a petal of a flower 2.0 cm in front of the lens to study it. The lens has a focal length of 5.0 cm.

(i) Calculate the distance of the image from the lens.

Distance of image = ________________cm
(2 marks)

(ii) Is the image real or virtual? ____
(1 mark)

C. Tom goes to a pool. He shines a **red laser** into the pool. He notices that even though the light ray bends, its colour does not change.

Explain why the colour of the laser remains the same.

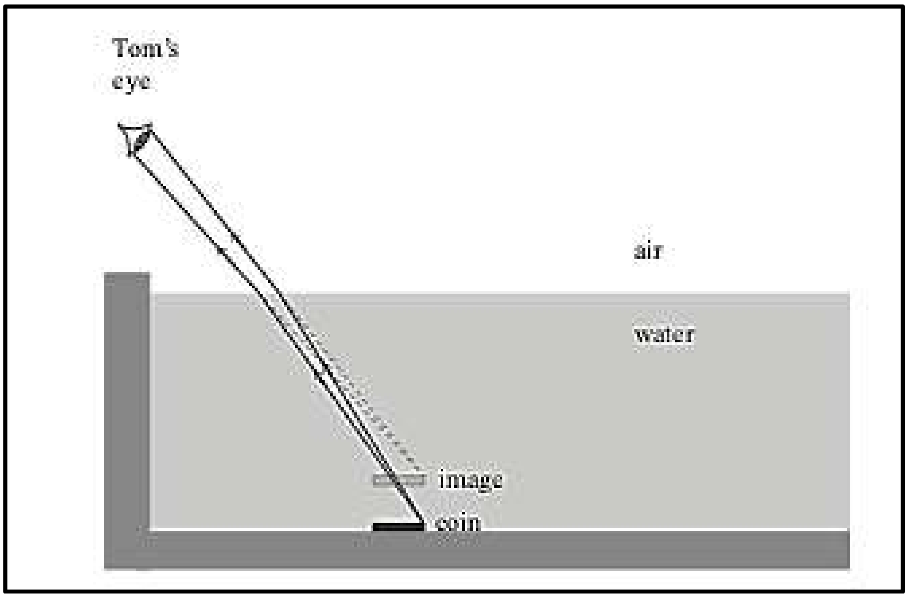
____

____

____

(2 marks)

D. There is a coin at the bottom of the pool. Tom looks at the coin from above and sees an image of the coin, as shown in the diagram below.



(i) State ONE (1) reason why the rays bend.

____

____

____

(1 mark)

(ii) Explain how the image of the coin at the bottom of the pool is formed when Tom looks at it from above.

____

____

____

____

____

(2 marks)

Q.1 | 16

QUESTION 2. **[16 marks]**

A. State ONE (1) feature for each of these lenses.

(i) Convex lens

____

____

(1 mark)

(ii) Concave lens

____

____

(1 mark)

B. A radio-controlled toy boat has a small siren that produces a sound. The siren can be turned on by sending radio waves from a remote control.

(i) Describe ONE (1) difference between radio waves and sound waves.

____

____

____

(2 marks)

(ii) The period of the siren is 0.00125s and the wavelength of the sound waves in air is 41 cm. Calculate the speed of the sound.

Speed of sound =______________________m/s

(2 marks)

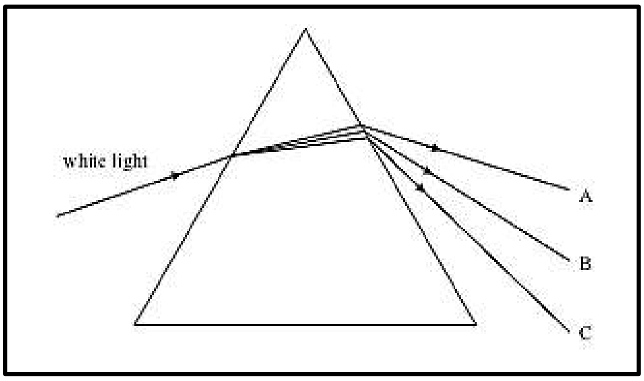
(iii) The boat is 180 m from the remote control. A radio wave is sent to turn on the siren. A person is standing with the remote control.

Calculate the time from when the remote control sends the radio wave to when the person hears the sound. The speed of sound in air is 328 m s^{-1}. Assume the speed of radio wave is $3x10^8$ ms^{-1}.

Time = ________________s

(2 marks)

C. When a ray of white light is shone into a prism, a spectrum of colours emerges on the other side of the prism. In the diagram below, the colour B is seen in the middle of the spectrum.



(i) Name the colours labelled A, B and C, in the diagram.

A __________________________ (1 mark)

B __________________________ (1 mark)

C __________________________ (1 mark)

(ii) Explain what this effect shows about the nature of white light.

___

___

___

(2 marks)

(iii) Explain using a diagram the photoelectric effect.

i. Photoelectric effect:

___

___

(1 mark)

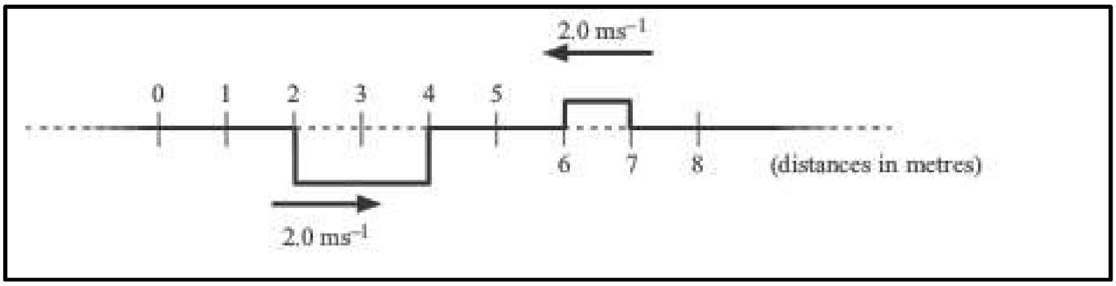
ii. Diagram:

(2 marks)

Q.2 | 16

QUESTION 3. **[16 marks]**

A. The diagram below shows two wave forms travelling in opposite directions with speeds as indicated. The wave coming from the right has half the amplitude of the wave coming from the left.



i. Describe the principle of superposition

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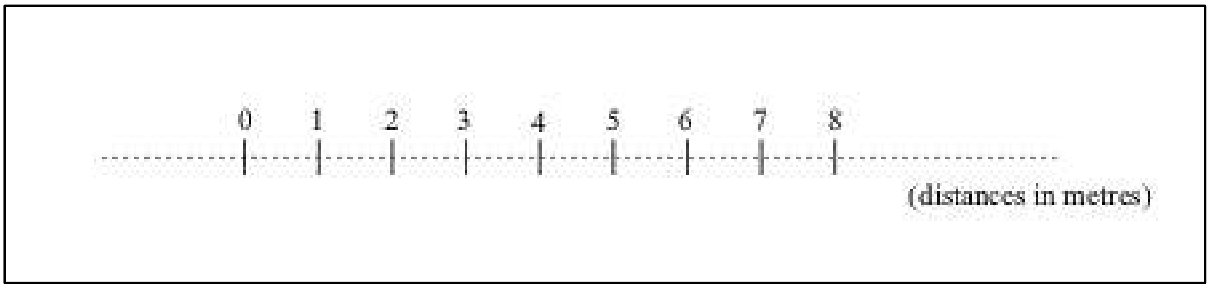
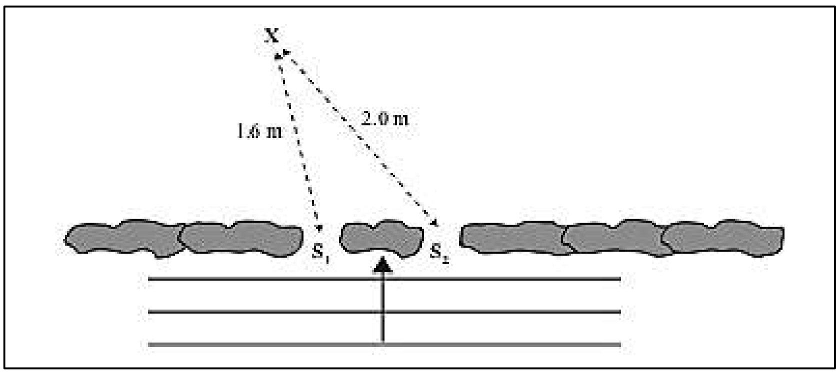
(2 marks)

ii. Use the principle of superposition to sketch the wave shapes 1.0 second after the time indicated on the diagram (graph) below. (1 mark)



B. A Form 6 student is watching water waves coming into the beach. At this place he noticed that there are two gaps (labelled S_1 and S_2) in the line of rocks (see the diagram below).

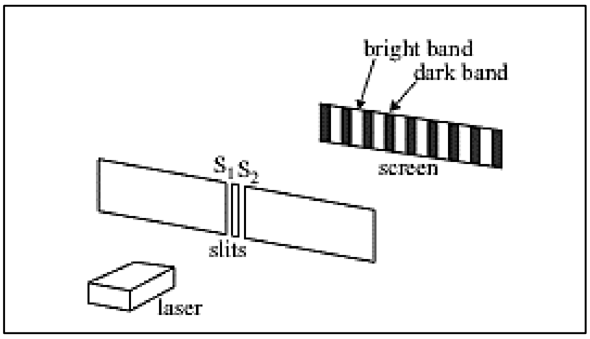


There is a set of waves passing through the gaps, creating an interference pattern. The difference between the distances from S_1 to X and S_2 to X is 0.40 m. The wave speed is 0.80 ms^{-1} and one wave reaches the wall every second (frequency).

Show with a calculation how **X** is at a node. (2 marks)

C. In a Young's double-slit experiment laser light was passed through two slits (S_1 and S_2) 0.325 mm apart and a pattern of bright and dark fringes appeared on a screen 7.20 m away (see the diagram below). The distance between pairs of adjacent bright fringes was found to be a constant 1.43 cm.

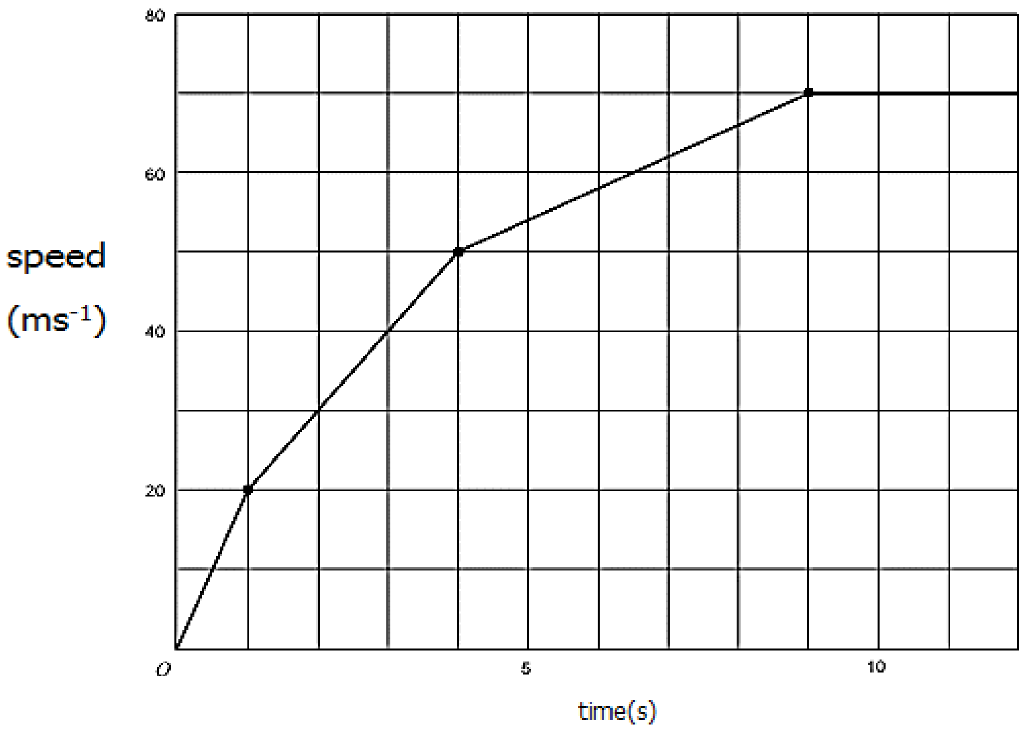
From this data determine the wavelength of the light used in the experiment.



Wavelength =______________________ m

(3 marks)

D. The diagram below shows the **speed** vs **time** graph of a racing car accelerating through the gears with constant acceleration in each gear. The car was initially at rest.



(i) Calculate the distance travelled by the car during the first four seconds of the motion.

Distance = ________________ m

(2 marks)

(ii) Determine the magnitude of the acceleration of the car from t = 1s to t=4s.

Acceleration = _____________ ms^{-2}

(2 marks)

(iii) Calculate the average speed of the car during the twelve seconds of the motion.

Average speed = _________________ ms^{-1}

(4 marks)

Q.3 **16**

QUESTION 4. **[16 marks]**

A. In a road test, a car was uniformly accelerated from rest over a distance of 400 m in 19.0 s. The driver then applied the brakes, stopping the car in 5.1 s with constant deceleration.

(i) Calculate the acceleration of the car for the first 400 m.

Acceleration = _____________ ms^{-2}

(2 marks)

(ii) Calculate the speed of the car at 400 m just before the brake is applied.

Speed = ______________ ms^{-1}

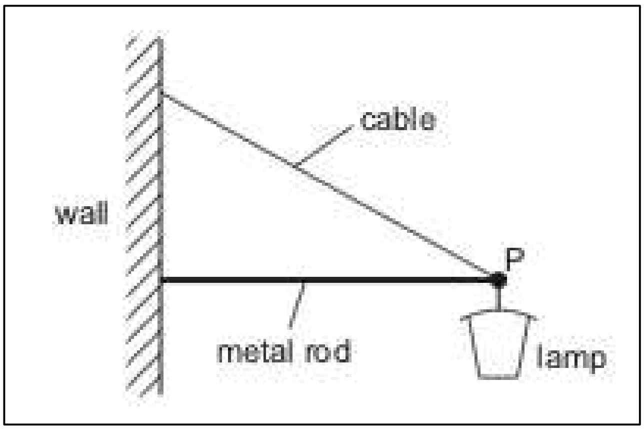
(2 marks)

(iii) Calculate the distance the car covered during the braking period

Distance=________________ m

(2 marks)

B. A street lamp is fixed to a wall by a metal rod and a cable as shown in the diagram below.



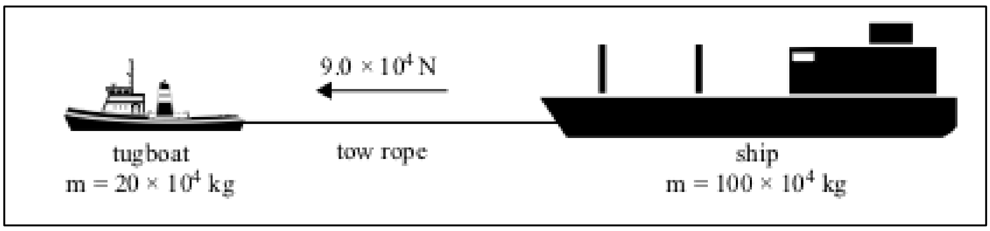
(i) On the diagram show all the forces acting at point P.

(2 marks)

(ii) Draw a **vector** diagram that could represent the forces acting at point P?

(2 marks)

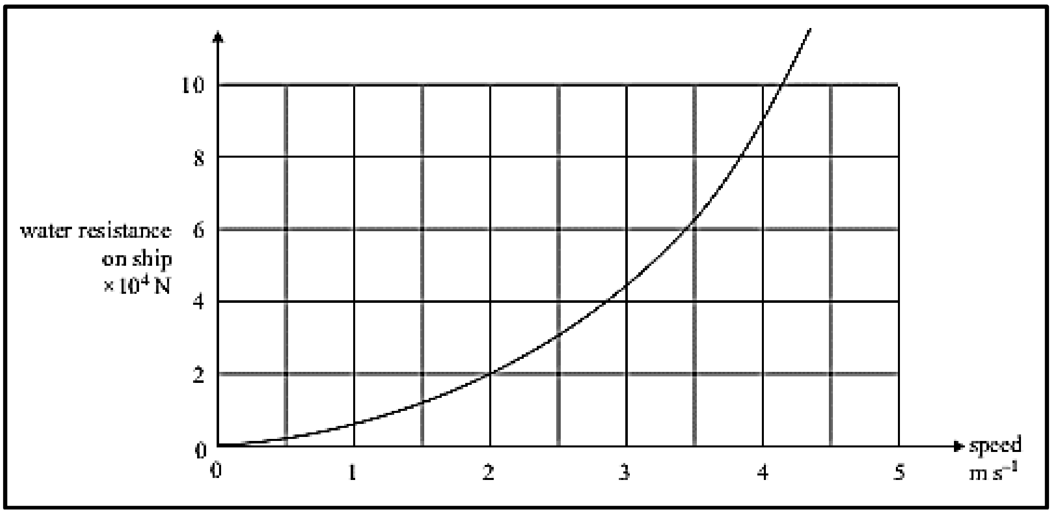
C. A tugboat is towing a ship with a tow rope as shown in the diagram below.



Mass of tugboat = 20×10^4 kg and mass of ship = 100×10^4 kg

The tugboat exerts a constant force of 9.0×10^4 N on the tow rope.

The water resistance on the ship as a function of speed is shown in the diagram below



Use the information provided above to answer question (i) and (ii).

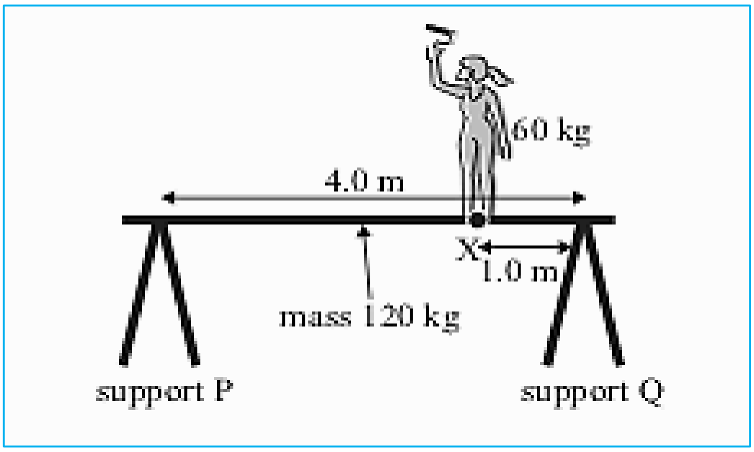
(i) What is the acceleration of the ship when the tugboat and ship are travelling at 2.0 ms^{-1}? You must show your working. (3 marks)

(ii) After a time, the tugboat and ship are travelling at a constant speed. What is this constant speed? (3 marks)

Q.4 16

QUESTION 5. **[16 marks]**

A. Elizabeth the painter has a mass of 60 kg and she stands on a plank of mass 120 kg at position X, 1.0 m from support Q, as shown in the diagram. The plank is supported by two supports (P and Q), each 2.0 m from the centre of the plank.



Calculate the forces exerted on the plank by support P and Q.

Force supported by P = _______________________;

(2 marks)

Force supported by Q = _______________________

(2 marks)

B. A small truck of mass 3000kg collides with a stationary car of mass 1000kg. They remain locked together as they move off. The speed immediately after the collision was known to be 7.0 ms^{-1}. Tino uses the principle of conservation of momentum to estimate the speed of the truck before the collision.

(i) Show Tino's calculated speed of the truck.

(2 marks)

(ii) The calculated value is questioned by Lazarus, who believes that conservation of momentum only applies in elastic collisions.

Explain why Lazarus comment is wrong.

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____

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(2 marks)

Using your calculated speed in (i) above, was the truck over speeding if the area zone has a speed limit of 40 km/h?

(2 marks)

C. Rachel drops a ball of mass 6 kg from a balcony (verandah). It takes the ball 1.2 seconds to reach the ground. (use $g = 9.81\ ms^{-2}$)

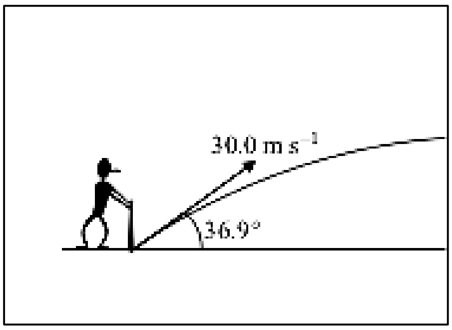
(i) Calculate the height of the balcony.

(2 marks)

(ii) Calculate the speed of the ball just before it hits the ground.

(2 marks)

D. A batsman hits a cricket ball (from ground level) at a speed of 30.0 ms^{-1} and at an angle of 36.9° to the horizontal as shown in the diagram below. Air resistance can be ignored.



Calculate the vertical and horizontal components of the initial speed (velocity) of the cricket ball?

Vertical component = ________________________ and

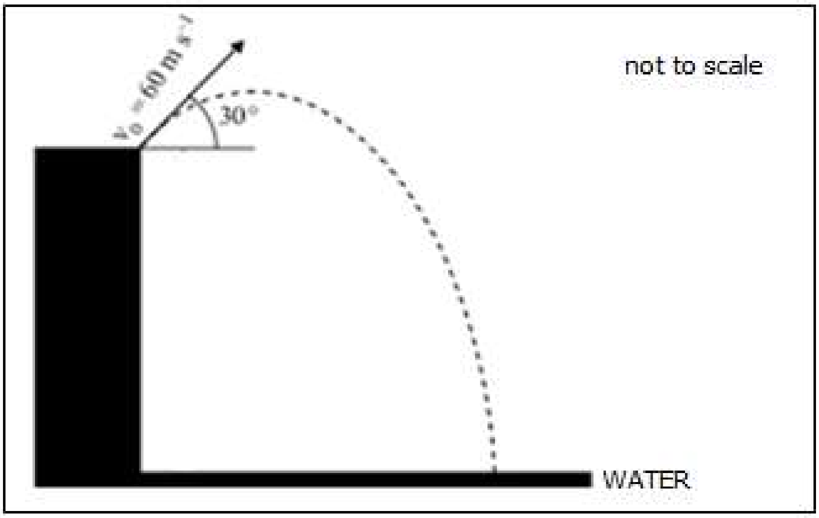
Horizontal component = ________________________

(2 marks)

Q.5 | 16

QUESTION 6. **[16 marks]**

A. Max hits a ball from the edge of a cliff. The ball has an initial speed of 60 ms^{-1} at an angle of 30° to the horizontal as shown in the diagram below. Ignore the effects of air resistance.



(i) When will the ball reach the maximum height?

Time = __________________s

(2 marks)

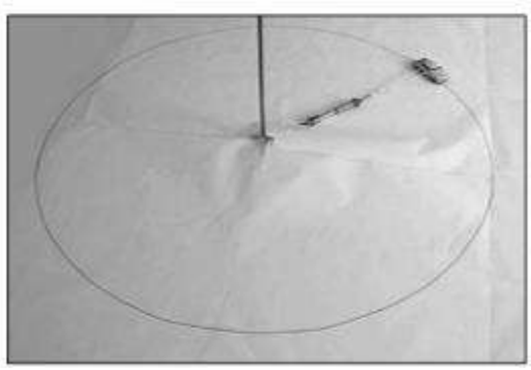
(ii) How high above the top of the cliff does the ball rise?

Height = _______________m

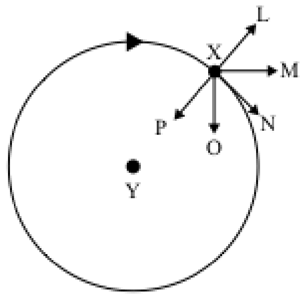
(2 marks)

B. Students set up an experiment to investigate circular motion. A battery-powered model car is connected to a string as shown in diagram (a). The experimental arrangement used is shown in diagram (b), where Y represents the centre and X represents the car.

The car has a mass of 2.4 kg. It moves at a constant speed of 2.0 ms^{-1}, around a circle of radius 1.6 m. Ignore mass of string and measuring device.



(a)



(b)

Use the above information to answer questions (i) and (ii).

(i) Calculate the tension in the string.

Tension = ______________________N

(2 marks)

(ii) Explain why arrow P in diagram (b) best indicates the direction of the resultant force on the car when it is at the point X?

____

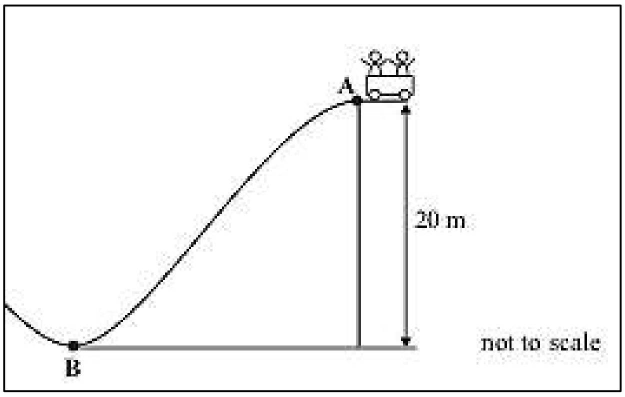
____

____

(2 marks)

C. Part of a roller coaster ride at an amusement park is shown in the diagram below. The car with people in it has total mass of 1000 kg. The car starts from rest at point A, a vertical height of 20 m above point B.

Ignore effects of friction.



(i) Calculate the potential energy of the car with people at point A.

Potential energy = ___________ J

(2 marks)

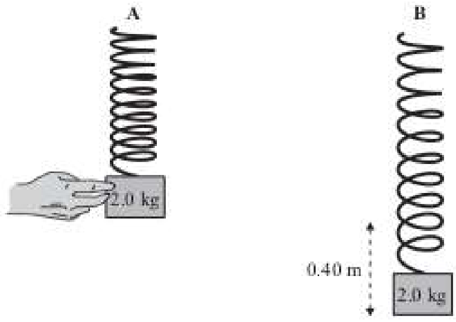
(ii) Calculate the speed of the car with people at point B.

Speed = _______________ ms^{-1}

(2 marks)

D. Diagram part A shows an ideal spring with a 2.0 kg mass attached. The spring-mass system is held so that the spring is not extended. The mass is gently lowered and the spring stretches until, the spring-mass system is at rest (see part B). The spring has extended by 0.40 m.

(i) What is the value of the spring constant, k, of the spring?



Spring constant, k = ____________________ Nm^{-1}

(2 marks)

(ii) Calculate the elastic potential energy of the spring when the spring is extended as in part B.

Elastic Potential energy, E_p = ____________________ J

(2 marks)

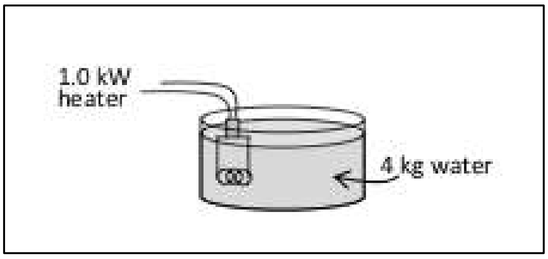
Q.6

16

QUESTION 7. **[16 marks]**

A. A mass of 4 kg of water at a temperature of 30ºC is heated using a 1.0 kW heater. Assume that no heat escapes into the air and that the container plays no part in any heat transfer.

The specific heat capacity of water is 4186 J/kgºC, and its Latent heat of vaporization is 22.6×10^{5} J kg^{-1}



(i) Explain what a specific heat capacity of a substance is.

____

____

____

(2 marks)

(ii) Calculate the amount of heat energy required to raise the temperature of the 4 kg of water from 30ºC to 100ºC.

Heat energy = _______________________ J

(2 marks)

(iii) When the temperature of the 4 kg water reach 100 ^{0}C, it remains constant even heating is continued. Explain what is happening at this stage.

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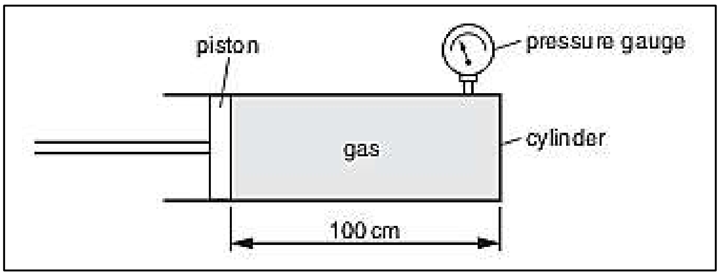
(3 marks)

B. The diagram below shows a gas contained in a cylinder enclosed by a piston.



At first, the length of cylinder containing the gas is 100 cm. The pressure of the gas, shown by the pressure gauge, is 300 kPa. The area of cross-section of the cylinder is 0.12 m^2

(i) Describe the **motion** of the molecules of the gas.

____

____

____

(2 marks)

(ii) Use the idea of momentum to explain how the molecules exert a force on the walls of the cylinder.

____

____

____

(2 marks)

(iii) The piston is moved so that the new length of cylinder occupied by the gas is 40 cm. The temperature of the gas is unchanged.

(a) Calculate the new pressure of the gas.

Pressure = ________________ Pa

(2 marks)

(b) Explain, in terms of the behaviour of the molecules, why the pressure has changed.

____

____

____

____

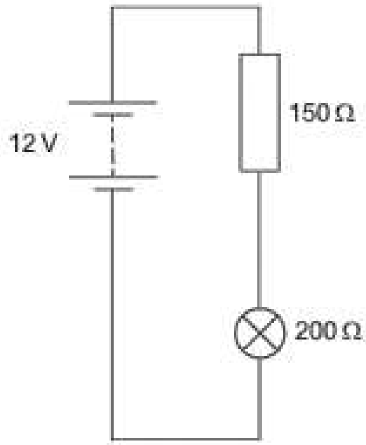
(3 marks)

Q.7 16

QUESTION 8. **[16 marks]**

A. A student connects the circuit shown in the diagram below.

(i) Calculate the current in the circuit.



Current = ______________ A

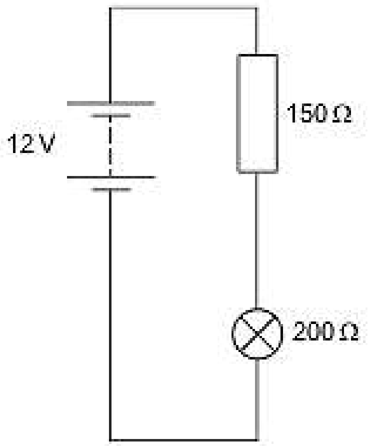
(3 marks)

(ii) Calculate the potential difference (p.d.) across the lamp.

p.d. = __________________V

(2 marks)

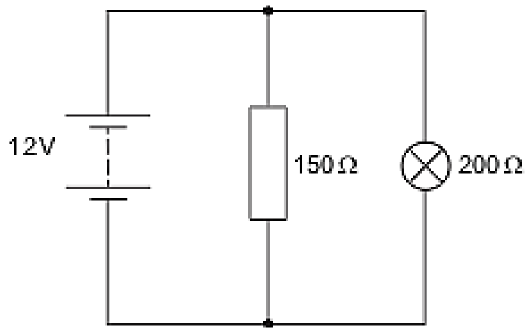
(iii) Draw on the diagram below to suggest how the circuit may be modified so that the brightness of the lamp can be controlled.



Modified diagram

(1 mark)

B. The above circuit in Question 8(A) is now re-arranged as shown below.



(i) What word is used to describe this new arrangement of the components?

____

(1 mark)

(ii) Calculate the current through the 150Ω.

Current, I = ____________________ A

(2 marks)

(iii) Calculate the power dissipated in the lamp.

Power, P= ____________________ W

(2 marks)

(iv) **State** and **explain** how the brightness of the lamp in this new arrangement compares to the lamp in the circuit in Question 8(A) above.

State ____

(1 mark)

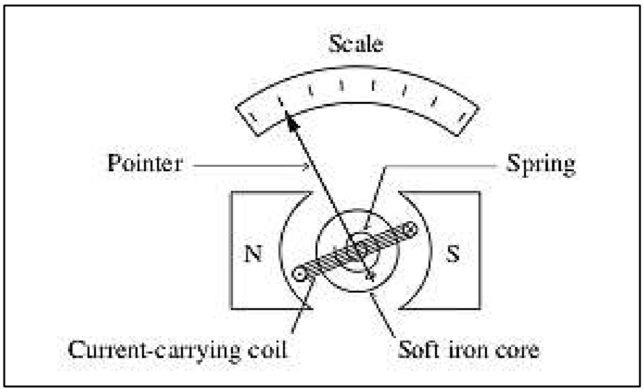
Explain ____

____

____

(2 marks)

C. The components of a galvanometer are shown in the diagram below.



What is the purpose of the spring in the galvanometer?

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____

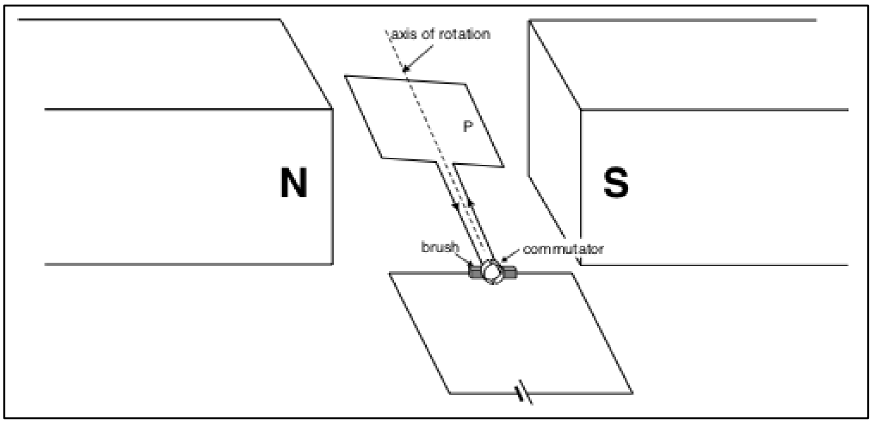
____

(2 marks)

Q.8 16

QUESTION 9. **[16 marks]**

A. The circuit of a simple DC electric motor is shown in the diagram below. It consists of a current-carrying coil of 50 turns as the armature. The coil is square with sides of 5.0 cm. The coil is in a uniform magnetic field of strength 0.005 T.



A current of 3.0 A flows through the coil in the direction shown in the diagram above.

(i) Calculate the magnitude of the force exerted on a single turn and on the 50 turns wires of side P of the coil.

Force = ______________________N

(2 marks)

(ii) In the diagram above, the ends of the coil are connected to the commutator so that it is free to rotate with the coil.

Explain why the commutator must be free to rotate in this manner and how this is fundamental to the operation of the DC electric motor.

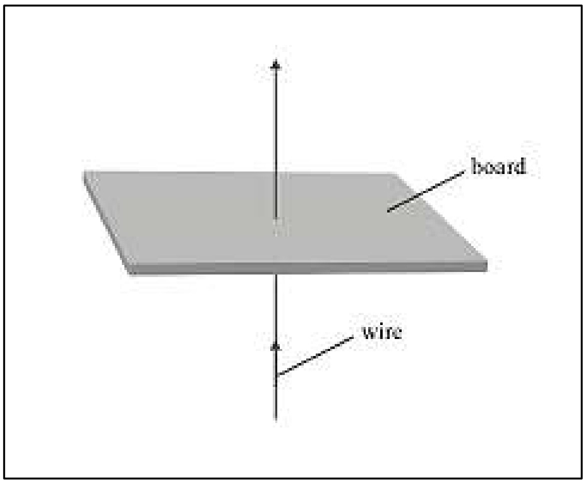
____

____

____

(2 marks)

B. A straight wire that carries a large current in the upward direction passes through a horizontal board, as shown in the diagram below.



(i) On the diagram above, draw the direction of the magnetic field produced by the current-carrying wire.

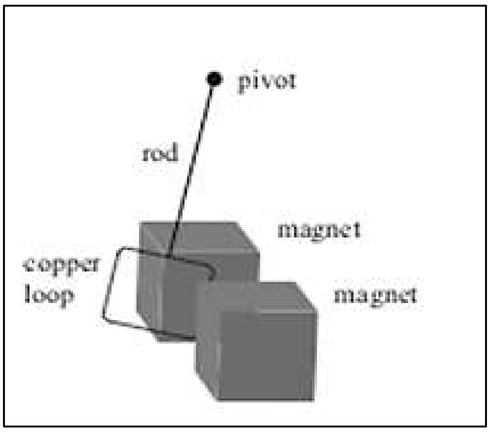
(2 marks)

(ii) If the current through the above wire is 3.0A, calculate the magnitude of the magnetic field at a point 50 cm perpendicular to the direction of the current.
$k = 2 \times 10^{-7}$ Tm/A

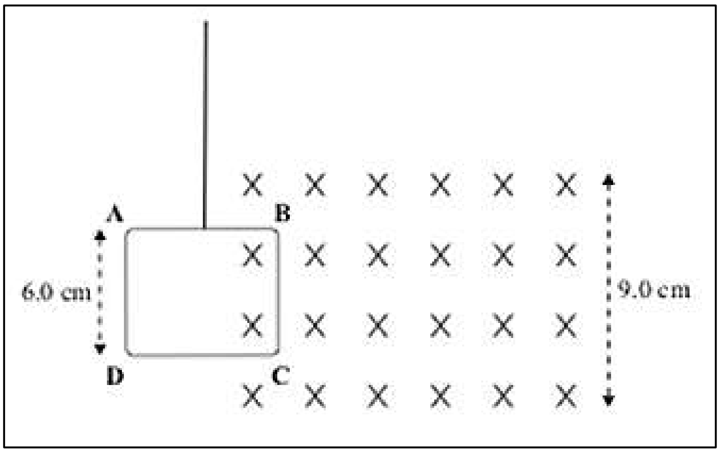
Magnetic field, B=____________________ T

(2 marks)

C. Peter builds a swing to show electromagnetic induction. It comprises a light rod, pivoted at the top so it can swing, and a loop of copper wire at the bottom. He places two strong magnets at the lowest point of the motion with opposite poles facing each other.



The diagrams below show the loop entering the magnetic field.



(i) Determine the direction of the force acting on electrons in the wire BC, due to their motion in the magnetic field. (Tick one of the following).

(1 mark)

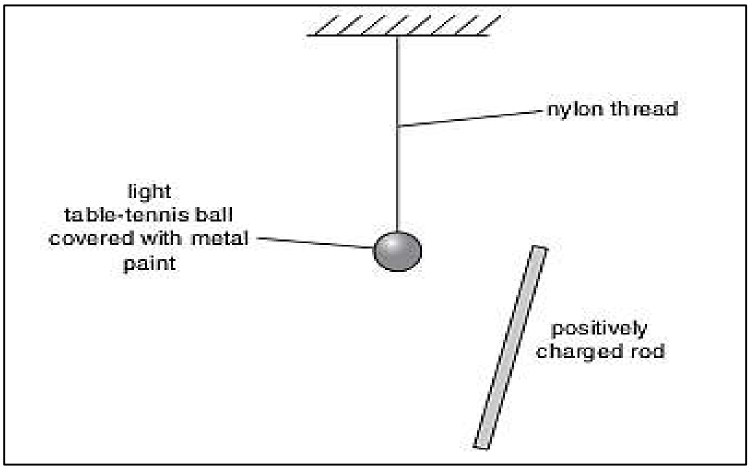
☐ Up
☐ Left
☐ Right
☐ Down

(ii) At the instant shown in the diagram, the voltage across the wire BC is 0.15 mV. Calculate the speed of the wire loop. The magnetic field strength is 3.0×10^{-3} T.

Speed, v=_______________ ms^{-1}

(2 marks)

D. A plastic rod is rubbed with a cloth and becomes positively charged. After charging, the rod is held close to the suspended table-tennis ball shown in the diagram below. The table-tennis ball is covered with metal paint and is uncharged.



(i) Describe what happens to the charges in the metal paint on the ball as the positively charged rod is brought close to the ball.

____

____

____

____

(3 marks)

(i) State the reaction of the positive charges when the rod is brought closer to the ball.

____

(1 mark)

(ii) State the unit in which electric charge is measured.

____

(1 mark)

Q.9 | 16

QUESTION 10. **[16 marks]**

A. A charge of 2.0×10^{-14} C is moved across a potential difference of 2.5×10^{2} V in 2s.

(i) Calculate the work done on the charge.

Work, W=____________________ J

(2 marks)

(ii) Calculate the power required to move the charge.

Power, P=______________W

(2 marks)

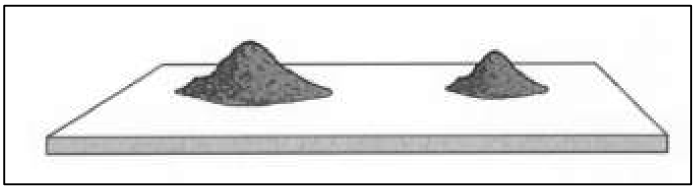
B. What is meant by radioactive decay?

____

____

(2 marks)

C. **The diagram below shows two samples of the same radioactive substance. The substance emits β-particles**.

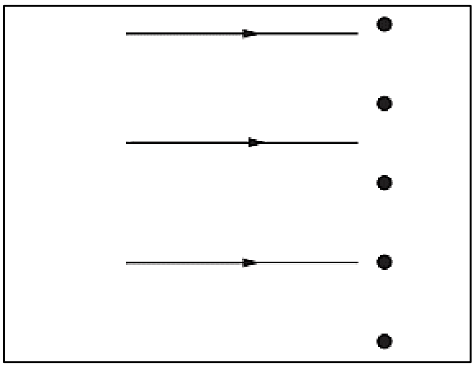


Put a tick (√) alongside the quantity that is the same for both samples. (1 mark)

- ☐ the half-life
- ☐ the mass
- ☐ the number of atoms decaying each second
- ☐ the number of β-particles emitted each second

D. In Geiger and Marsden's α-particle scattering experiment, α-particles were directed at a very thin gold foil.

The diagram below shows five of the nuclei of the atoms in one layer in the gold foil. Also shown are the paths of three α-particles directed at the foil.



(i) **On the diagram above complete the paths of the three α-particles.** (3 marks)

(ii) The nuclide notation for an α-particle is $^{4}_{2}\alpha$

State the number of protons and neutrons in an α-particle

protons =__________________________ (1 mark)

neutrons = __________________________ (1 mark)

E. People handling radioactive substances need to take certain safety precautions.

(i) Explain why safety precautions are necessary.

____

____

____

(2 marks)

(ii) State TWO (2) safety precautions used by people handling radioactive substances

(a) ____

(1 mark)

(b) ____

(1 mark)

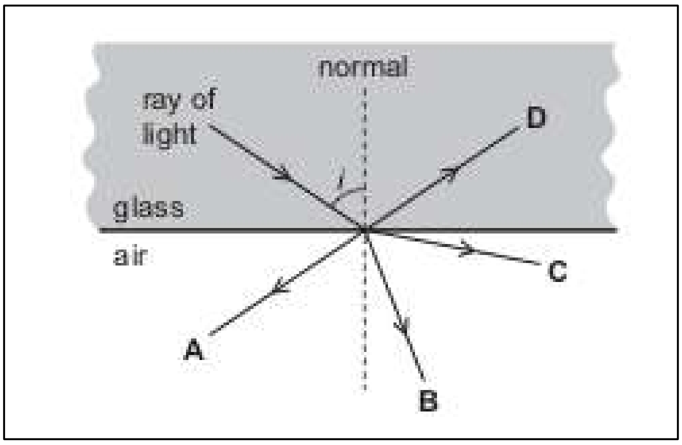
Q.10 (/ **16**)

SECTION B: MULTIPLE CHOICE QUESTIONS (40 MARKS)

WRITE THE CORRECT LETTER OF YOUR ANSWER ON THE BACKFLAP OF THIS BOOKLET. THERE ARE 20 MULTIPLE CHOICE QUESTIONS WORTH 2 MARKS EACH.

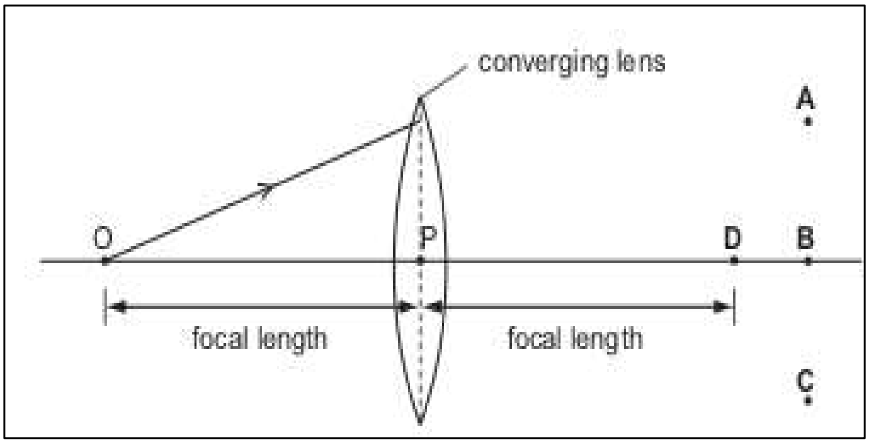
Q1. The diagram shows a ray of light incident on the edge of a piece of glass. The angle ***i*** is greater than the critical angle.

Circle the arrow (A, B, C or D) on the diagram below that shows the direction of the ray after it leaves the edge of the glass?



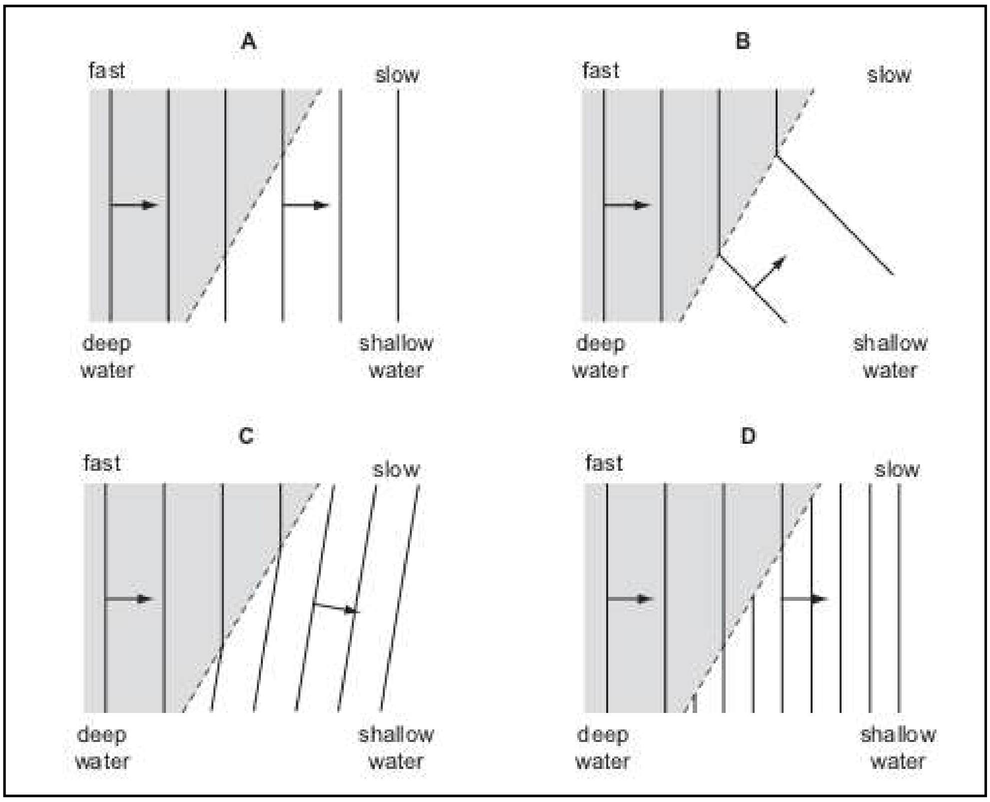
Q2. In the diagram, the distance OP is the focal length of the converging lens. One ray of light from O is shown.

Through which point will this ray pass, after refraction by the lens? Circle your correct answer (A, B, C or D) on the diagram below.

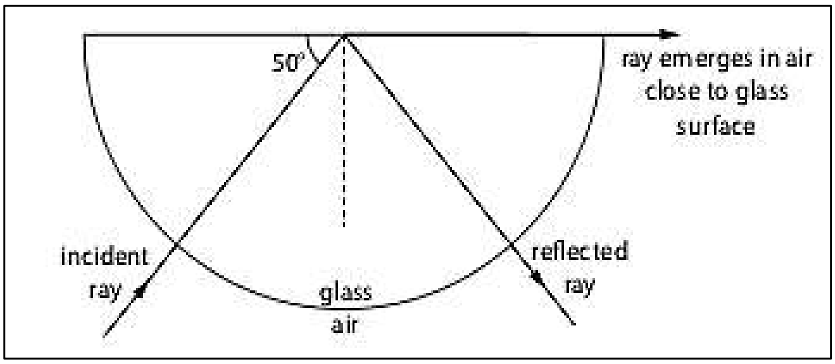


Q3. The diagrams show water waves that move more slowly after passing into shallow water.

Which diagram shows what happens to the waves? Circle your correct answer (A, B, C or D) on the diagrams below.



Q4. The diagram shows a ray of **monochromatic** light passing through a semi-circular glass block.

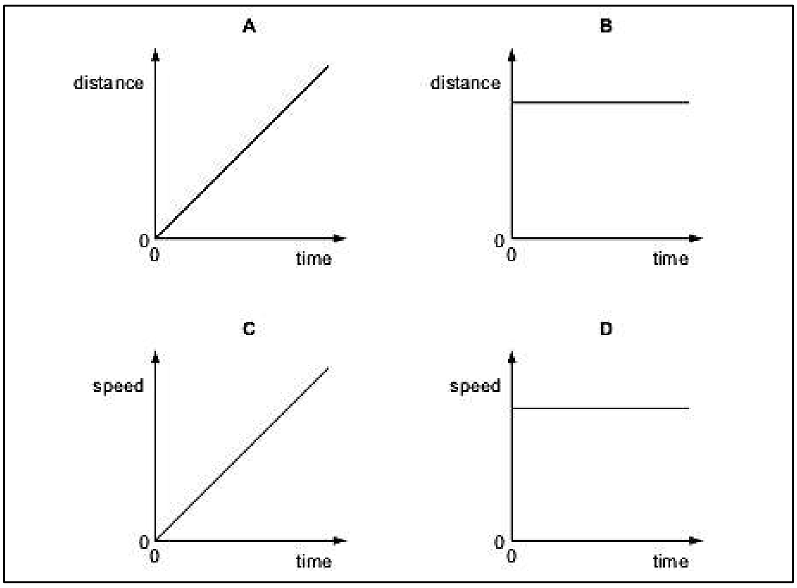


What is the refractive index of the glass?

A. 0.64
B. 0.77
C. 1.31
D. 1.56

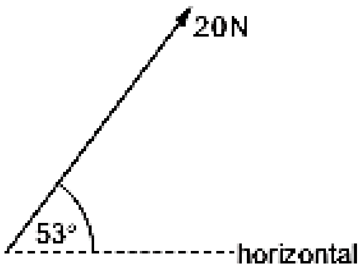
Q5. Two distance-time graphs and two speed-time graphs are shown.

Which graph represents an object that is accelerating? Circle your correct answer (A, B, C or D) on the diagrams below.



Q6. What is the horizontal component of the force shown?

A. 12N
B. 16N
C. 20N
D. 27N



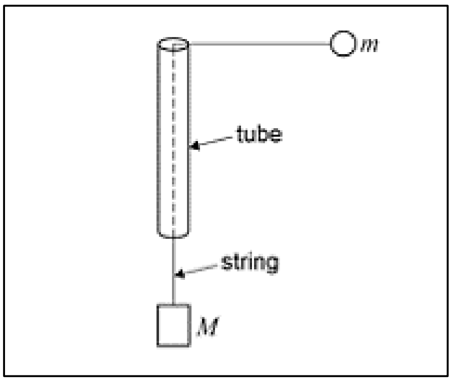
Q7. Two cars of masses m and 3m move towards each other in opposite directions with speeds 2v and v respectively. These trucks collide and stick together.

What is the speed of the cars after the collision?

A. $\frac{v}{4}$ **B.** $\frac{v}{2}$ **C.** V **D.** $\frac{5v}{4}$

Q8. A string passes through a smooth thin tube. Masses **m** and **M** are attached to the ends of the string. The tube is moved so that the mass **m** travels in a horizontal circle of constant radius **r** and at constant speed **v**.

Which of the following expressions is equal to **M**?



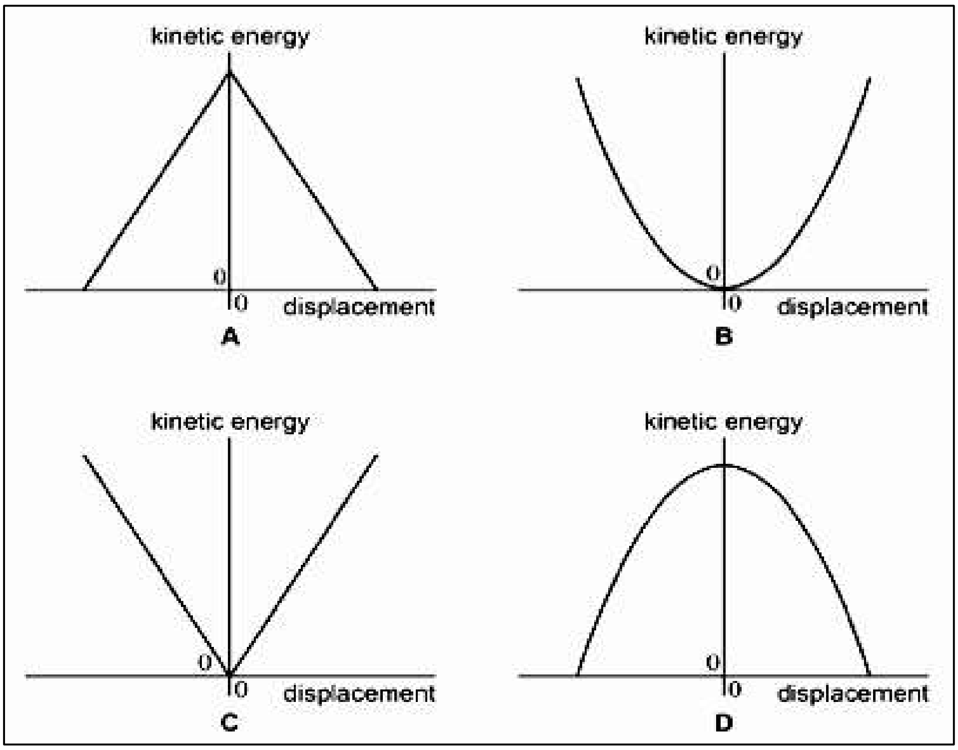
A. $\frac{mv^2}{2r}$ **B.** mv^2rg

C. $\frac{mv^2}{rg}$ **D.** $\frac{mv^2g}{r}$

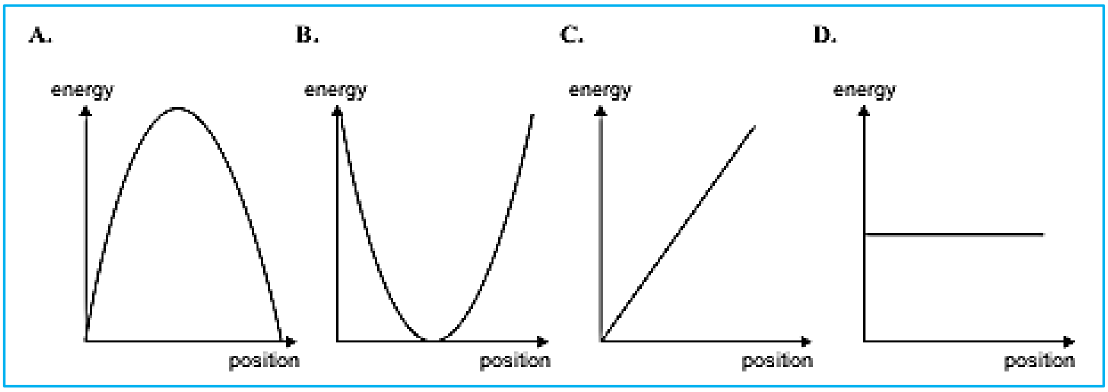
Q9. The amount of heat required to raise the temperature of a 1 kg of a substance by 1°C is called as:

A. heat capacity.
B. work capacity.
C. latent heat capacity.
D. specific heat capacity.

Q10. Which graph best shows how the kinetic energy of a simple pendulum varies with displacement from the equilibrium position? Circle your correct answer (A, B, C or D) on the diagrams below.



Q11. Which one of the curves (A–D) below could best represent the variation of the total energy of the **oscillating mass-spring system** as a function of position? Circle your correct answer (A, B, C or D) on the diagrams below.



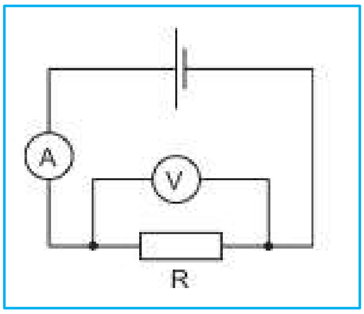
Q12. A sealed gas cylinder is left outside on a hot, sunny day. What happens to the average speed of the gas molecules and to the pressure of the gas in the cylinder as the temperature of the gas rises?

	average speed of gas molecules	**pressure of gas in cylinder**
A	decreases	decreases
B	decreases	increases
C	increases	decreases
D	increases	increases

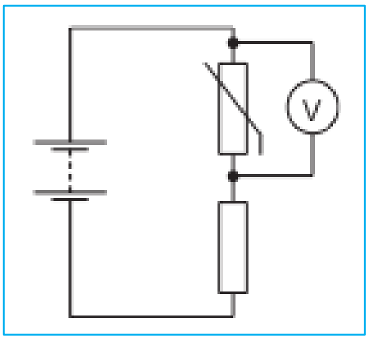
Q13. A circuit is set up to determine the resistance of a resistor R. The meter readings are 2.0A and 3.0 V.

What is the resistance of the resistor R?

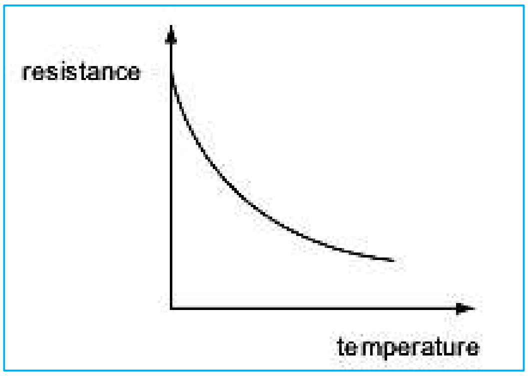
A. 0.67Ω
B. 1.5Ω
C. 5.0Ω
D. 6.0Ω



Q14. The circuit diagram shows a thermistor in a potential divider. A voltmeter is connected across the thermistor.



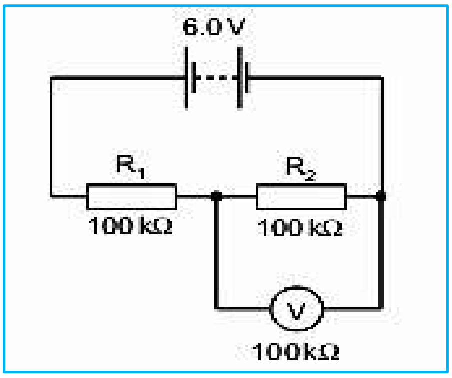
The graph shows how the resistance of the thermistor changes with temperature.



As the thermistor becomes warmer, what happens to its resistance and what happens to the reading on the voltmeter?

	resistance	voltmeter reading
A.	decreases	decreases
B.	decreases	increases
C.	increases	decreases
D.	increases	increases

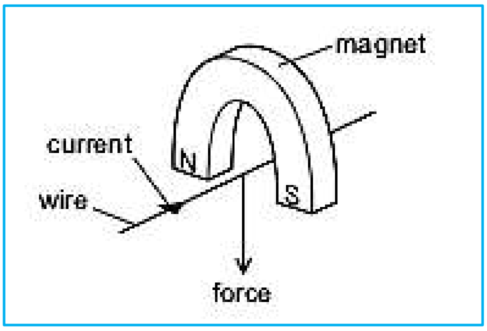
Q15. In the circuit shown, the 6.0 V battery has negligible internal resistance. Resistors R_1 and R_2 and the voltmeter have resistance 100kΩ.



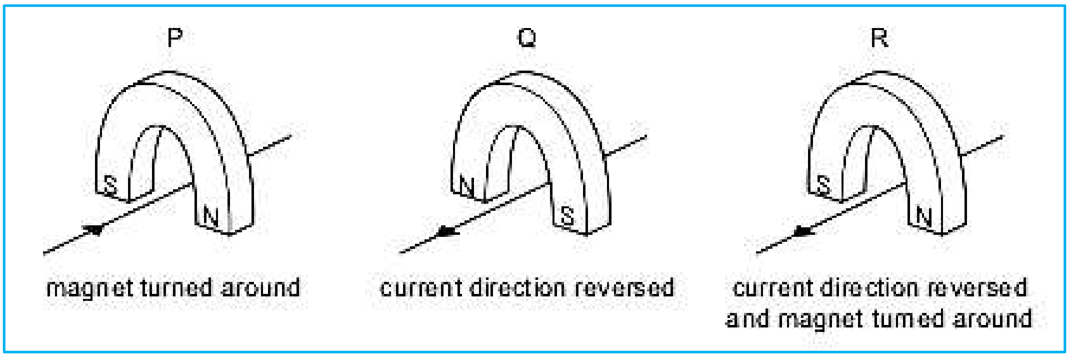
What is the current in the resistor R_2?

A. 20μA
B. 30μA
C. 40μA
D. 60μA

Q16. A wire is placed between the poles of a horseshoe magnet. There is a current in the wire in the direction shown, and this causes a force to act on the wire.



Three (3) other arrangements, P, Q and R, of the wire and magnet are set up as shown.

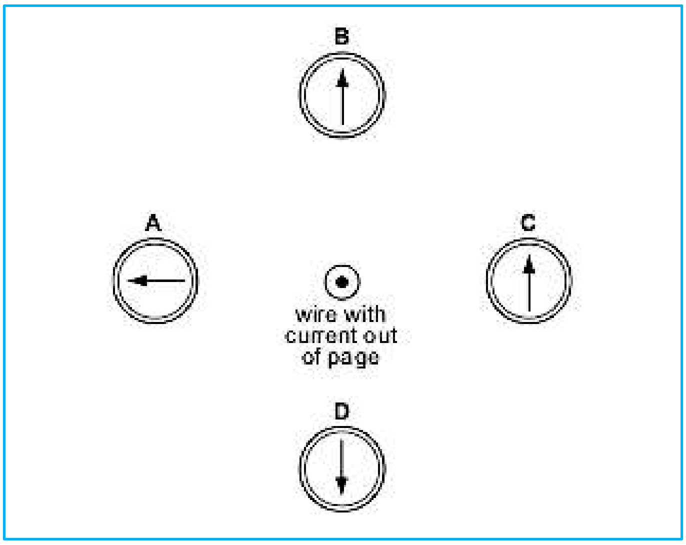


Which arrangement or arrangements will cause a force in the same direction as the original arrangement?

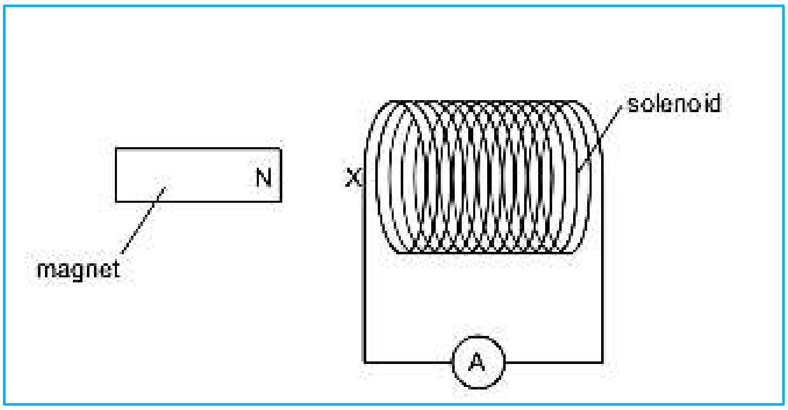
A. **P, Q** and **R**
B. **P** and **Q** only
C. **P** only
D. **R** only

Q17. A wire perpendicular to the page carries an electric current in a direction out of the page. There are four compasses near the wire.

Circle the correct compass below (A, B, C or D) that shows the direction of the magnetic field caused by the current?



Q18. A solenoid is connected in series with a sensitive ammeter. The **N** pole of a magnet is placed next to one end of the solenoid, marked **X.**



When the **N** pole of the magnet is pushed towards **X**, which type of magnetic pole is induced at **X** during this stage?

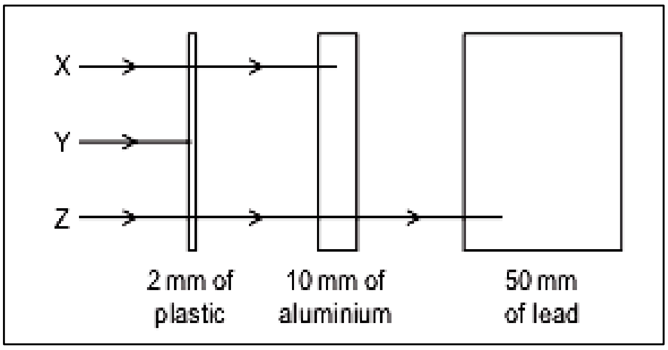
	as N pole moves towards X	**as N pole moves away from X**
A	N pole	N pole
B	S pole	N pole
C	N pole	S pole
D	S pole	S pole

Q19. A polythene rod repels an inflated balloon hanging from a nylon thread.

Why do the rod and balloon repel?

A. The rod and the balloon have opposite charges.
B. The rod and the balloon have like charges.
C. The rod is charged but the balloon is not.
D. The balloon is charged but the rod is not.

Q20. The diagram shows the paths of three (3) different types of radiation, **X, Y** and **Z.**



Which row in the table correctly identifies **X, Y** and **Z?**

	X	**Y**	**Z**
A.	β -particles	α-particles	γ-rays
B.	α-particles	β -particles	γ-rays
C.	β-particles	γ-rays	α -particles
D.	γ-rays	α -particles	β-particles

Section B: Q1- Q.20

40

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SECTION B
MULTIPLE CHOICE (40 MARKS)

Write clearly the letter of the correct answer in the box provided. Make sure your answer is put alongside the right question number.

EXAMPLE:

If you consider B is the correct answer, write it like this: [B]

To change your answer from B to C, cross out B and write the new answer by the box, like this: [~~B~~] C

1.	[ ]	11.	[ ]
2.	[ ]	12.	[ ]
3.	[ ]	13.	[ ]
4.	[ ]	14.	[ ]
5.	[ ]	15.	[ ]
6.	[ ]	16.	[ ]
7.	[ ]	17.	[ ]
8.	[ ]	18.	[ ]
9.	[ ]	19.	[ ]
10.	[ ]	20.	[ ]

Number correct [ ] X 2 = [ ] / 40

Student Personal Identification Number

PHYSICS 2018

FOR MARKER USE ONLY			
QUESTION	**MARKS**	**MARKER**	**SCRIPT CHECKER**
Section B	**40**		
A Q.1	**16**		
A Q.2	**16**		
A Q.3	**16**		
A Q.4	**16**		
A Q.5	**16**		
A Q.6	**16**		
A Q.7	**16**		
A Q.8	**16**		
A Q.9	**16**		
A Q.10	**16**		
TOTAL	**200**		
Marker/Checker Initials			