MARKER CODE

Student Personal Identification Number

SOLOMON ISLANDS NATIONAL FORM SIX CERTIFICATE

PHYSICS

2019

QUESTION and ANSWER BOOKLET

WEDNESDAY 13th 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 showing calculations clearly.

Section B: 40 marks 45 minutes

- There are TWENTY (20) Multiple Choice Questions. Each is worth 2 marks.
- Write your answers to this section on the back-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 back-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 **2-38** in the correct order and that none of the pages is blank except for pages **36** and **37** that have been left blank deliberately.

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

TOTAL MARKS

200

SECTION A: SHORT ANSWER QUESTIONS (160 MARKS)

ATTEMPT ALL QUESTIONS IN THIS SECTION.

WRITE THE ANSWER TO EACH QUESTION IN THE SPACE PROVIDED. 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 acceleration due to gravity, $g = 9.81\ ms^{-2}$ where required.

QUESTION 1. [16 marks]

(a) Explain why shadow is formed when light shines onto an opaque object.

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(2 marks)

(b) State the **difference** between a real and a virtual image.

(i) Real image:

____

____

(1 mark)

(ii) Virtual image:

____

____

(1 mark)

(c) Dentists use a curved mirror to examine the tooth of a patient.

(i) Name the type of curved mirror used.

Mirror type: ________________________________ (1 mark)

(ii) Where the tooth (as the object) should be placed (positioned) to get an enlarged image of the tooth?

____

(1 mark)

(iii) Write down TWO (2) **characteristics** of the curved mirror mentioned above in (c) (i).

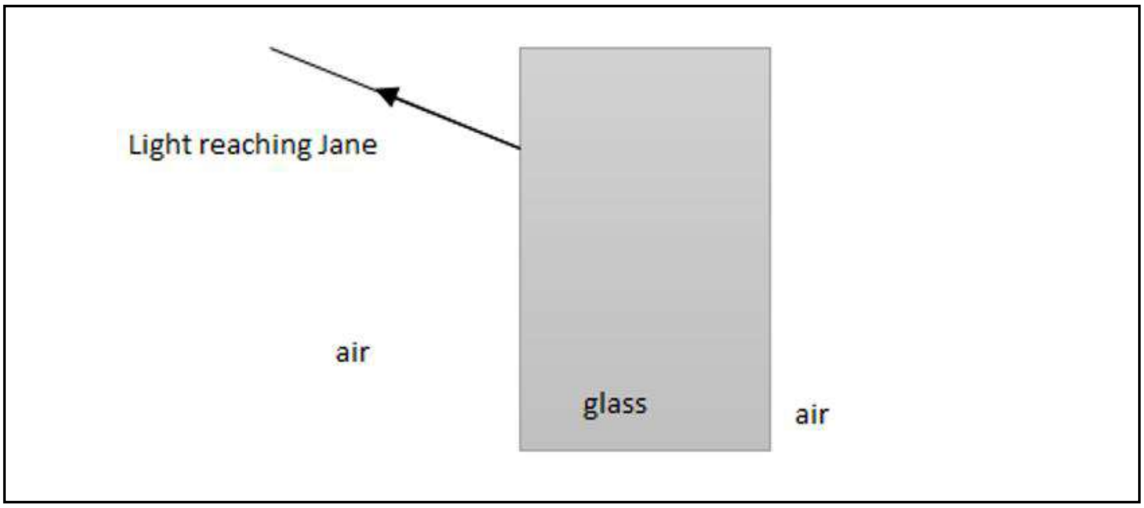
(1) ____

(2) ____

(2 marks)

(d) The diagram below shows a ray of light from outside the window reaching Jane after it has travelled through a glass.

(i) Show the complete path of the ray, as an incoming ray and when it travels through the glass in the diagram below.



(2 marks)

(ii) Name the **effect** that occurs when light passes into the glass, and give a **reason** why this occurs.

Effect: ____________________________ (1 mark)

Reason:

____

____

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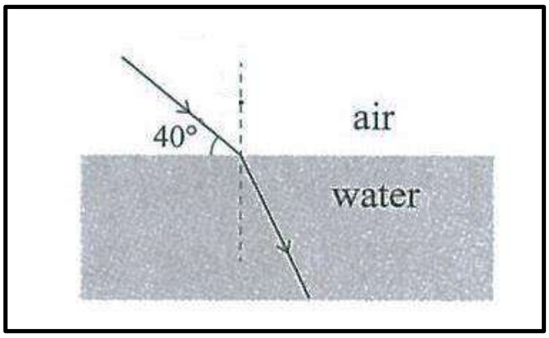
(2 marks)

(e) Harrison shines a red laser at an angle of 40^0 to the surface of water in a pool as shown in the diagram below.



Refractive index of air = 1.00

Refractive index of water = 1.33

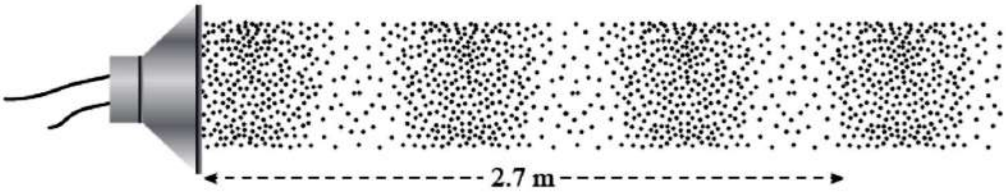
Calculate the angle of refraction. (3 marks)

Angle = ______________°

Sect A: Q.1. Total marks	
	16

QUESTION 2. [16 marks]

(a) When a speaker produces a particular frequency of sound, the air particles in front of the speaker produce a pattern as shown in the diagram below.



(i) Describe the direction of movement of an air particle associated with the sound produced by the speaker. You may draw arrow(s) on the diagram to show the direction of movement of the air particle.

____

____

____

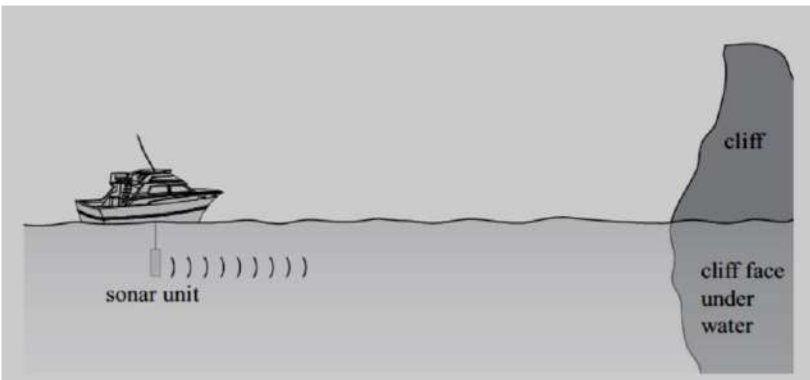
(2 marks)

(ii) From the information given in the above diagram, calculate the **wavelength** of the sound wave in air produced by the speaker.

Wavelength, λ= ________________ m

(2 marks)

(b) A sonar unit is set up near a cliff as shown in the diagram below. The transmitter in the sonar unit sends a pulse towards the submerged cliff face. The receiver in the sonar unit picks up the reflected pulse from the submerged cliff face 0.54s later. The frequency of the sonar pulse is 10 kHz and its wavelength is 0.153 m.

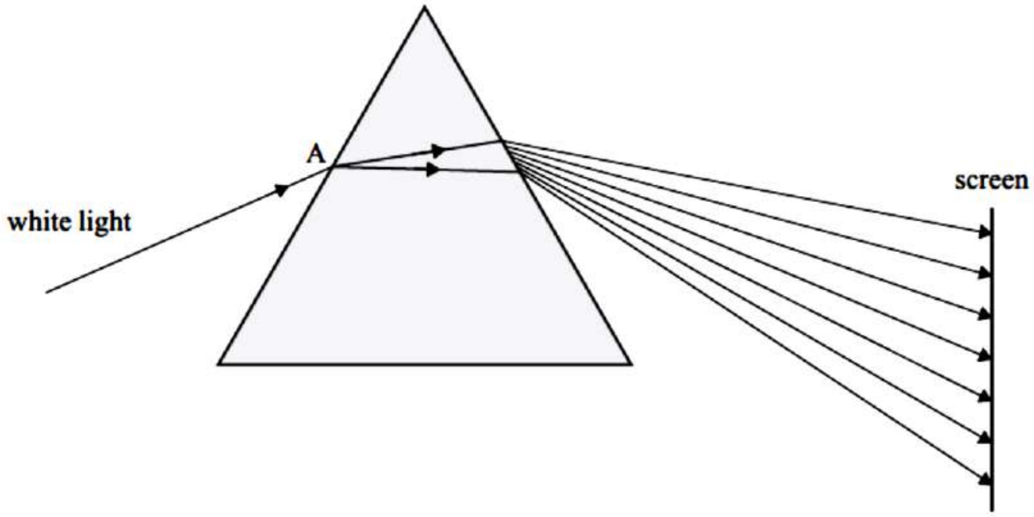


Calculate the distance between the sonar transmitter and the cliff face under water on page 5.

Distance = _______________m

(3 marks)

(c) The diagram below shows a ray of white light entering a prism at point A.



(i) State the TWO (2) **phenomena** that take place as the incident ray enters the prism at point A.

____

____

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(2 marks)

(ii) Explain why the **white light** splits up into seven colours as shown in the above diagram.

____

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(2 marks)

(iii) Red light bends the least and violet light bends the most. Why did violet light bend the most?

____

____

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(2 marks)

(d) Light is dual in nature.

(i) What does it mean that light is dual in nature? (1 mark)

____

____

(ii) Give TWO (2) examples to show that light is dual in nature.

(1) ____

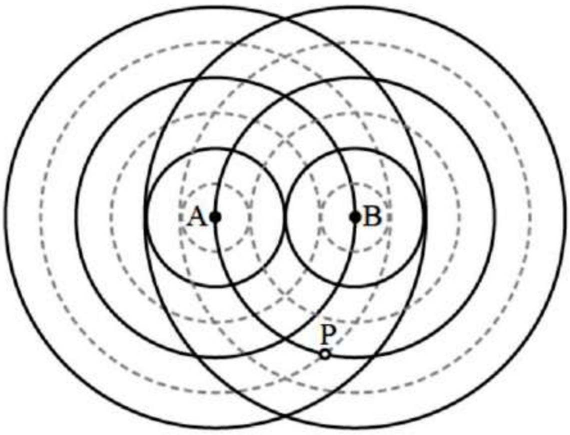
(2) ____

(2 marks)

<u>Sect A</u>: Q.2. Total marks	
	16

QUESTION 3. [16 marks]

(a) Two in-phase point sources, A and B, generate waves as indicated in the diagram below, in which the bold lines indicate **crests** and the dotted lines indicate **troughs**.



(i) Comment on the **difference in path length** between the lines AP and BP with reference to the wavelength of the waves.

____

____

____

(2 marks)

(ii) Describe the **type of interference** produced at point P.

____

____

(2 marks)

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

(i) From this information, calculate the **wavelength** of the light.

Wavelength, λ= __________________ m

(2 marks)

(ii) The light source used in the above experiment is **coherent**. What does this mean?

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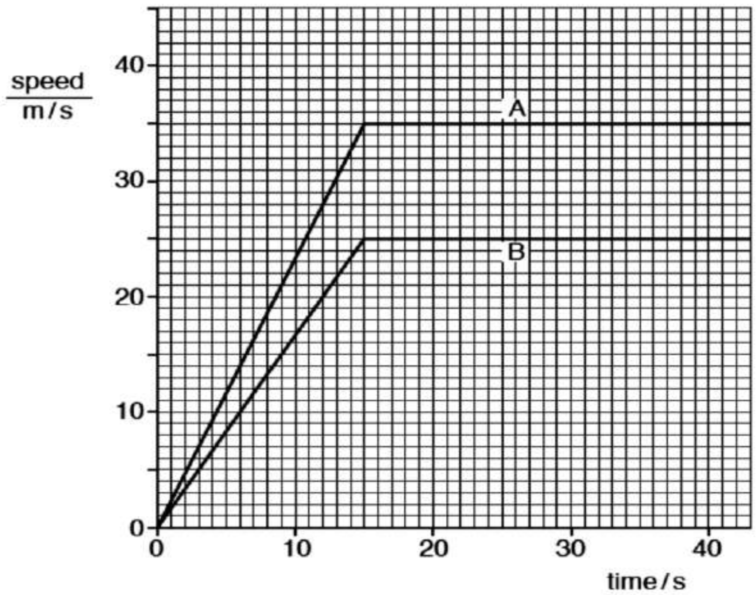
____

____

(2 marks)

(c) Three racing cars, A, B, and C, all accelerate steadily and then continued at a constant speed. The graph below gives information about the movement of car A and car B at the start of the race.



(i) Car C has a greater acceleration than car A, but it reaches a lower constant speed than car B. On the graph above, draw a line to show the movement of Car C. (2 marks)

(ii) Using the graph above, state the **maximum speed** of car A and Car B.

Speed of Car A: _________________________ m/s (1 mark)

Speed of Car B: _________________________ m/s (1 mark)

(iii) Calculate the **acceleration** of 'Car A' in the first 15 seconds. Round your answer to 2 decimal places.

Acceleration: _______________m/s^2

(2 marks)

(iv) Calculate the **distance** travelled by 'car B' when accelerating.

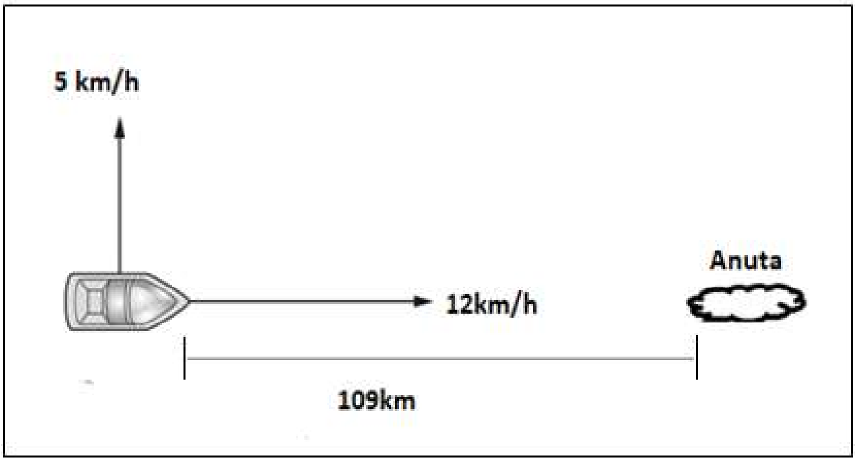
Distance: _____________________ m

(2 marks)

Sect A: **Q.3**. Total marks	
	16

QUESTION 4. [16 marks]

(a) A boat is travelling eastward towards Anuta Island with a velocity of 12 km/h. A wind from the south pushes the boat northwards at a velocity of 5 km/h. *(See diagram below).*



(i) What is the **magnitude** of the resultant velocity of the boat as it travels across to Anuta?

Resultant velocity = ______________________ km/h

(2 marks)

(ii) If the skipper of the boat wants to land on Anuta Island which is directly eastward, calculate the **direction** he should direct the boat.

Angle = __________°, direction = _____________________

(2 marks)

(iii) Anuta Island is 109 km away. At what **speed** must the boat travel to reach the island, assuming the conditions are same throughout the trip?

Speed, s = ______________ kmh^{-1}

(2 marks)

(iv) How long will it take for the boat to arrive on the island, assuming the conditions are same throughout the trip?

Time = _______________ hours

(2 marks)

(b) Students set up an experiment that consists of two masses, m_1 = 2.0 kg, and m_2 = 6.0 kg, connected by a string as shown in the diagram below. The surface and the pulley are frictionless. (*Ignore the mass of string).*

At the start of the experiment, mass m_1 is 1.2 m above the floor and both masses are stationary.

(i) Calculate the **gravitational force** on m_1.

Gravitational force = ____________________ N

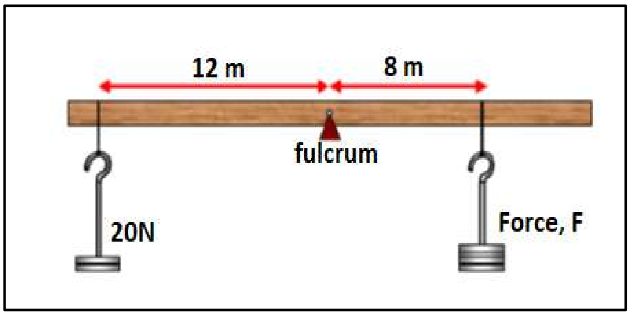
(2 marks)

(ii) Calculate the **tension** in the string when the system accelerates downward at 2.5 m/s^2.

Tension = ________________ N

(2 marks)

(c) A Form six student set up the following apparatus to investigate the clockwise and anticlockwise torque (moment). Study the diagram below and answer questions (i-ii) that follow.



(i) Calculate the **anticlockwise torque** (moment) of the above system.

Torque = ________________ Nm

(2 marks)

(ii) What value of **Force, *F*** can be applied to balance the above system?

Force, *F*= ______________________ N

(2 marks)

Sect A: **Q.4.** Total marks	
	16

QUESTION 5. [16 marks]

(a) The diagram below shows an experiment in which two frictionless trolleys, m_1, of mass 2.0 kg, moving to the right at 6.0 ms^{-1}, collides and sticks to an initially stationary trolley, m_2, of mass 4.0 kg.

(i) Calculate the **magnitude** of the total momentum of the two trolleys when they stick together after the collision.

Total momentum after = ________________ kgms^{-2}

(2 marks)

(ii) What is the **difference** between elastic and inelastic collisions?

(1) Elastic collision: ____

(2) Inelastic collision: ____

(2 marks)

(iii) Show that the above collision is **elastic**. *(Hint: By calculation)*.

(4 marks)

(b) At time t=0, a ball is projected upwards from a point 0 and rises to a maximum height of 40 m above point 0. The ball is modelled as a particle moving freely under gravity.

(i) Show that the **speed** of the projection upwards is 28 ms^{-1}.

Speed = _______________ ms^{-1}

(2 marks)

(ii) Find the **time**, in seconds, when the ball reaches the maximum height.

Time = ______________________ s

(2 marks)

(iii) Calculate the **total flight time** when the ball is back at point 0.

Total flight time = _________________ s

(2 marks)

(c) Explain why light and heavy objects when release from rest at the same height above the ground will take same time to hit the ground when air resistance is zero. (2 marks)

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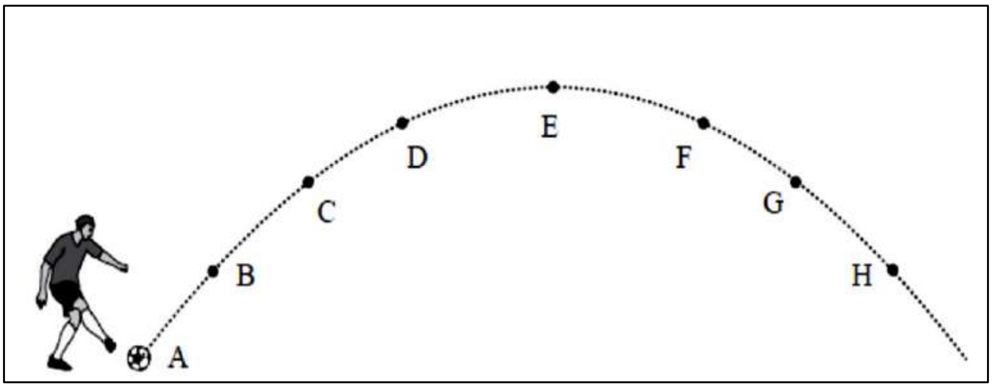
<u>Sect A</u>: Q.5. Total marks	
	16

QUESTION 6. **[16 marks]**

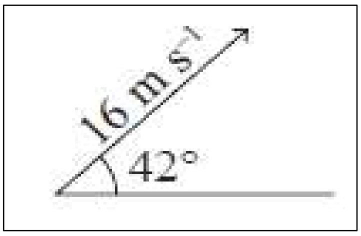
(a) The diagram below shows the **trajectory** of the ball. *(Neglect air resistance).*



(i) On the diagram, draw **arrows of appropriate length** to show the following;

- the force on the ball at positions **C** and **G.** (2 marks)
- the horizontal components of the velocity of the ball at positions **B** and **H.** (2 marks)

The ball is kicked with an **initial velocity** of 16 m s^{-1}, at an angle of 42° to the ground.



(ii) Calculate the **initial vertical** component of the velocity of the ball at position **A**.

Initial vertical velocity = _______________ ms^{-1}

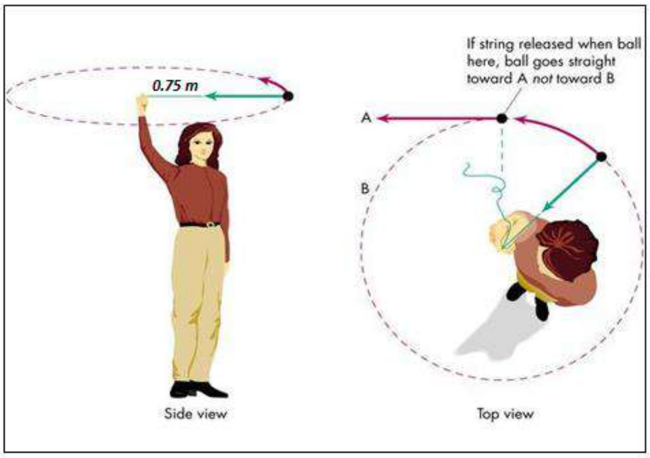
(2 marks)

(iii) Calculate the **time** to reach the maximum height.

Time = _______________ s

(2 marks)

(b) Jane swings a ball tied on a string in a horizontal circle above her head as shown in the diagram below. The length of the string (from hand to ball) is 0.75 m. It takes 0.84 seconds for the ball to go around her head once.



(i) Why did the ball keep accelerating even though it was swinging at a constant speed?

____

____

(1 mark)

(ii) Calculate the **speed** of the ball. (2 marks)

Speed, s = _______________ ms^{-1}

(iii) Calculate the **acceleration** of the ball. (2 marks)

Acceleration = _______________ ms^{-2}

(iv) Indicate the **direction of acceleration** of the ball. (1 mark)

Direction: ____

(v) Name the **force** and **direction** that causes the ball to accelerate as it moves in a circle.

(1) Name of force: ____

(1 mark)

(2) Direction: ____

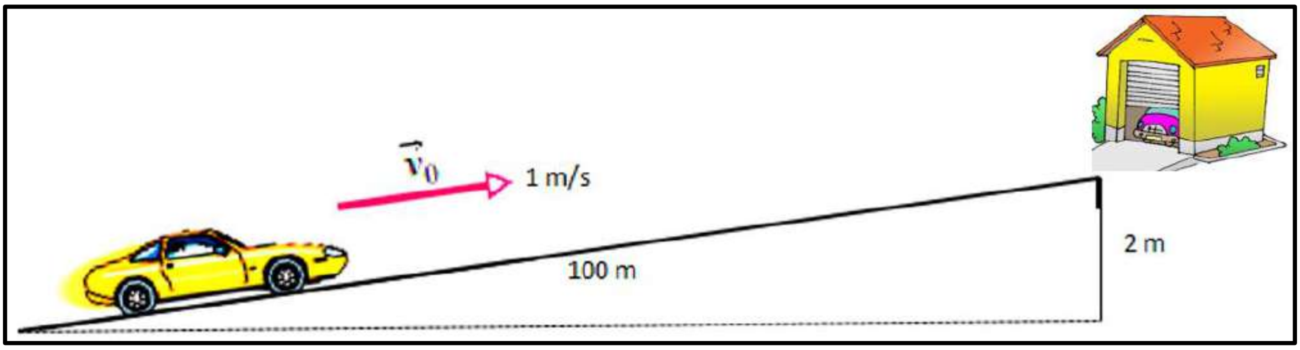
____

(1 mark)

Sect A: **Q.6**. Total marks	
	16

QUESTION 7. [16 marks]

(a) A person pushes a 600 kg car up to a garage after running out of petrol. The car moves with a uniform velocity of 1 ms^{-1}, and the person pushing must overcome a frictional force of 50 N.



(i) How much work is done **against friction** in pushing the car 100 meters up to the garage?

Work done against friction= ________________ J

(2 marks)

(ii) How much work is done **against gravity** in pushing the car up to the garage?

Work done against gravity= ________________ J

(2 marks)

(iii) Calculate the **total work done** in pushing the car up to the garage.

Total work done = ________________ J

(2 marks)

(iv) Calculate the **mechanical power** involved.

Power = __________________ W

(2 marks)

(b) A balloon is filled with 2.33L of *Helium* at 304K. If it is moved indoors where the temperature is 293K, what will be the new volume of the balloon? (*Assume that pressure remains unchanged)*.

New volume = _________________

(3 marks)

(c) An ideal gas of 2.49 moles is contained in a 1.00L container at a pressure of 143kPa. Determine the **temperature of the gas in degree Celsius**. Molar gas constant, R = 8.31 $JK^{-1}mol^{-1}$

Temperature = ________________°C

(3 marks)

(d) A gas is contained in a container. Explain why at constant temperature, pressure of the gas increases when its volume decreases.

(2 marks)

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____

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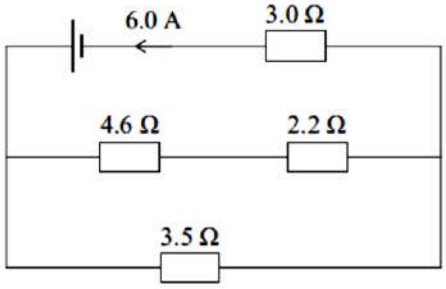
Sect A: **Q.7.** Total marks	
	16

QUESTION 8. **[16 marks]**

(a) John is investigating electrical circuits in the lab. He connects various resistors in combination. The current drawn from the supply is 6.0 A.



(i) Calculate the **effective** (total) resistance of the circuit.

Total resistance = _______________ Ω

(4 marks)

(ii) Calculate the size of the voltage across the 3.5 Ω resistor.

Voltage = ____________________ V

(2 marks)

(iii) Explain which **resistor**, the 4.6 Ω or the 2.2 Ω resistor, would convert the greater amount of energy per second into heat.

____

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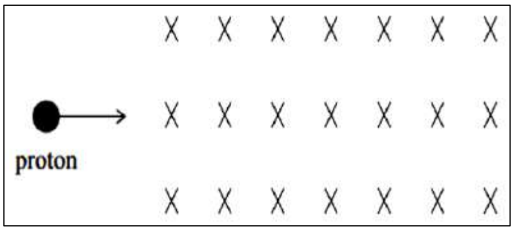
____

____

(2 marks)

(b) A proton of charge +1.6 × 10^{-19} C moves at right angles across a magnetic field of strength 0.65 T. The constant speed of the proton (in the magnetic field) is 4.8 × 10^{3} ms^{-1}.



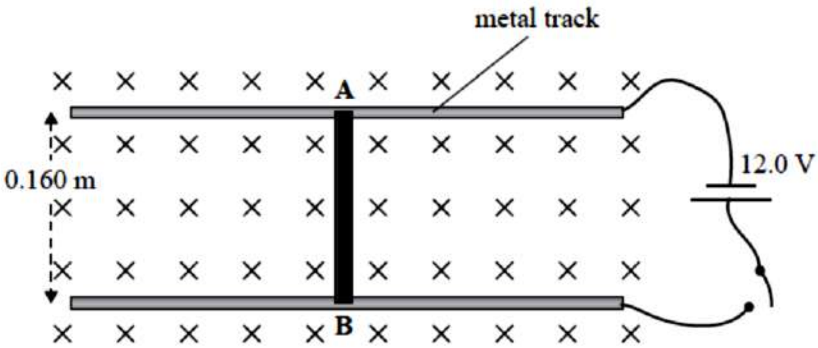
(i) In the diagram above, **draw the path** of the movement of the proton due to its velocity and the magnetic force. (2 marks)

(ii) Calculate the size of the **magnetic force** on the proton while it is in the field.

Magnetic force = _______________ N

(2 marks)

(c) A metal rod AB (*length, l* = 0.160 m) is free to slide on two parallel metal tracks connected to a 12.0 V battery, thus forming a closed circuit when the switch is closed. The rod AB has a resistance of 20.0 Ω, and the tracks have negligible resistance. A uniform magnetic field of strength 1.50 × 10^{-3} T, is applied perpendicular to the plane of this circuit.



When the switch is closed, rod AB moves.

(i) In what direction does the rod AB move when the switch is closed?

Direction: _______________________________________ (1 mark)

(ii) Calculate the size of the force experienced by the rod AB.

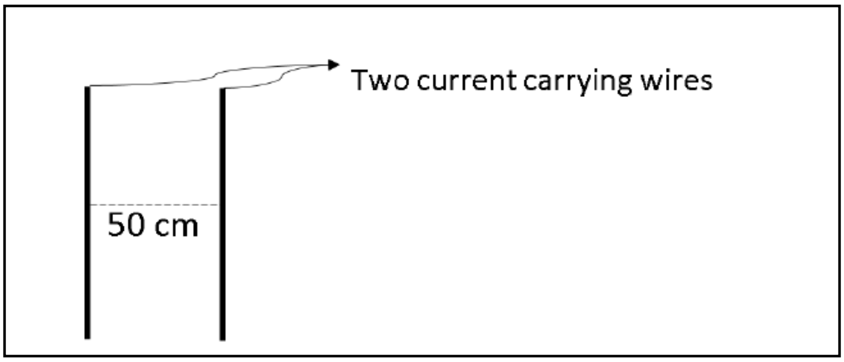
Force = ________________

(3 marks)

<u>Sect A</u>: Q.8. Total marks	
	16

QUESTION 9. [16 marks]

(a) The diagram below shows two current carrying wires separated by 50 cm in the air.



(i) Calculate the magnitude of the **force per unit length** between the two wires if the two wires are carrying currents of 5A and 10A. Use k= 2 x 10^{-7} NA^{-2}

Force per unit length = _______________ Nm^{-1}

(2 marks)

(ii) If the two wires in (i) above are carrying currents in the same direction, describe the **magnetic force** that exists between the two wires.

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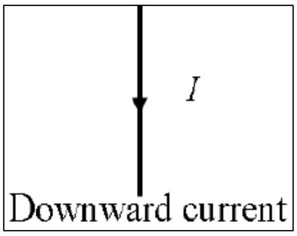
____

____

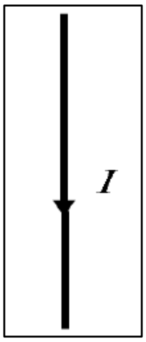
(2 marks)

(b) Shown in the diagram below is a long wire carrying a current in the **downward direction**.



(i) Draw the direction of the magnetic field associated with current flowing in the wire. (*Use the diagram below)*.

(2 marks)

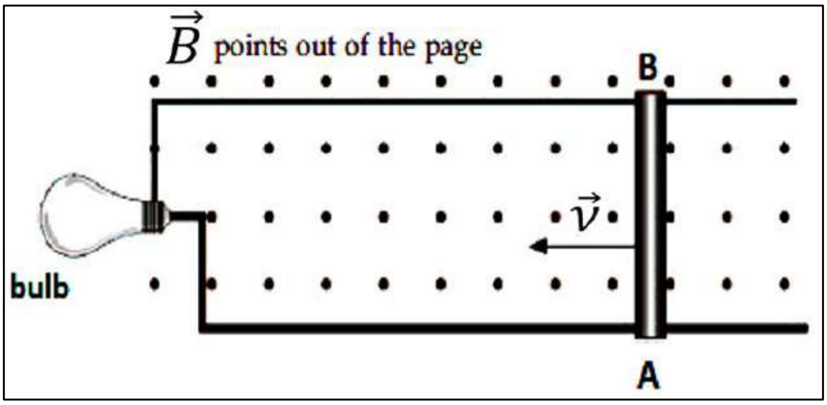


(ii) Calculate the magnetic field intensity (B), 25 cm from the wire in Q9 (b) (i) above if a current of 10A is flowing downwards. Use k= 2 x 10^{-7} NA^{-2}

Magnetic field = _________________ T

(2 marks)

(c) The rod AB in the diagram below is moving at a speed of 8.0 m/s in a direction perpendicular to a 0.50 T magnetic field. The rod has a length of 1.5 m and a negligible resistance. The conducting rails also have a negligible resistance. The light bulb has a resistance of 96.0 Ω.



(i) Explain how an emf (voltage) is induced across rod AB.

____

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____

(2 marks)

(ii) Calculate the induced emf **(voltage)** across rod AB.

Voltage = _____________ V

(2 marks)

(iii) Calculate the size of the induced **current** flowing through the metal rod AB.

Current = _____________ A

(2 marks)

(iv) Describe the **direction of flow** of the induced conventional current.

____

____

____

(2 marks)

<u>Sect A</u>: Q.9. Total marks	
	16

QUESTION 10. [16 marks]

(a) A point charge of $+3.00 \times 10^{-6}$ C is 12.0 cm distant from a second point charge of -1.50×10^{-6} C.

(i) Calculate the **magnitude of the force** between the two point charges. ($k = 9x10^{9}$ $N.m^{2}C^{-2}$)

Force = ________________ N

(2 marks)

(ii) Explain whether the **resultant force** is attractive or repulsive.

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____

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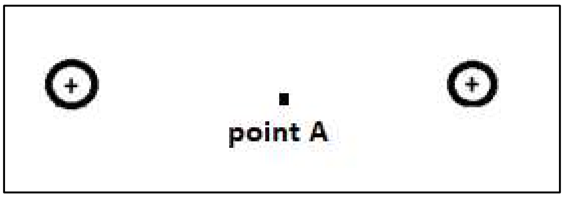
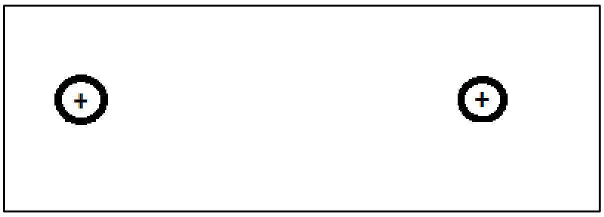
(2 marks)

(b) The diagram below shows two equal positive point charges side by side.



(i) Draw the **electric field lines** for the two positive point charges in the diagram below. (2 marks)



(ii) If point **A** is half way between the two positive point charges, describe the electric field strength at **point A** due to the two charges.

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(2 marks)

(c) Phosphorus-32 is a radioactive isotope that emits beta radiation.

(i) How is an atom of phosphorus-32 different from an atom of the stable isotope phosphorus-31?

____

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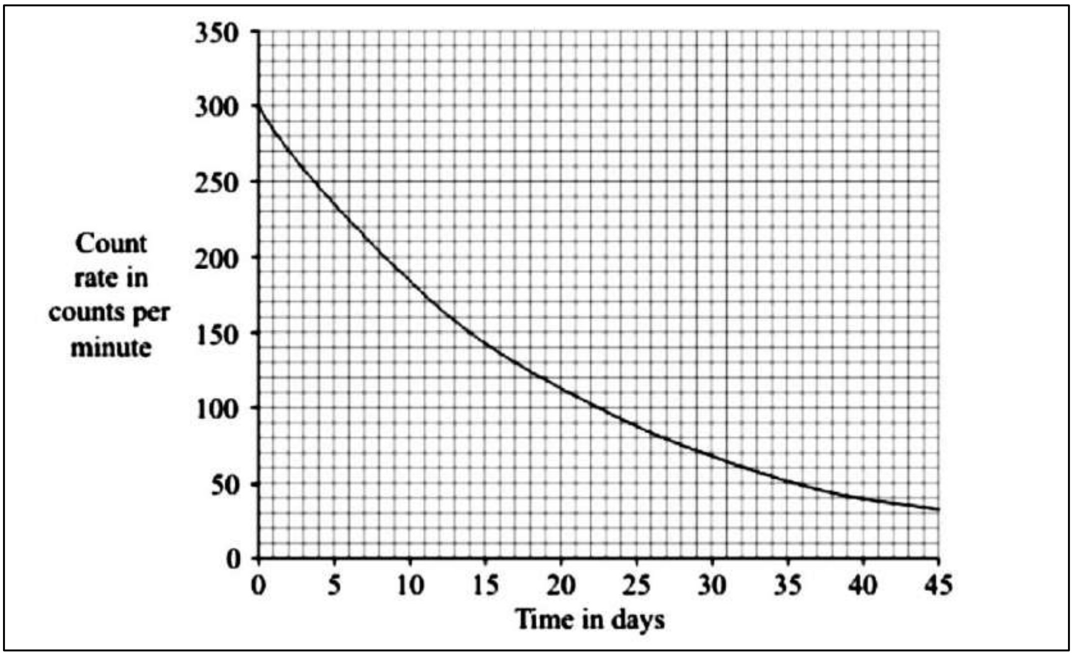
(2 marks)

(ii) The graph below shows how the count rate of a sample of phosphorus-32 changes with time. Use the graph to calculate the half-life of phosphorus-32.



(2 marks)

(d) Alpha particles (α), beta particles (β) and gamma rays (γ) are types of nuclear radiation.

(i) Which of the three types is the strongest ionising radiation?

____ (1 mark)

(ii) State THREE (3) **effects** that nuclear radiation has on living cells.

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____

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(3 marks)

Sect A: **Q.10**. Total marks	
	16

<u>SECTION B</u>: <u>MULTIPLE CHOICE QUESTIONS</u> (40 MARKS)

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

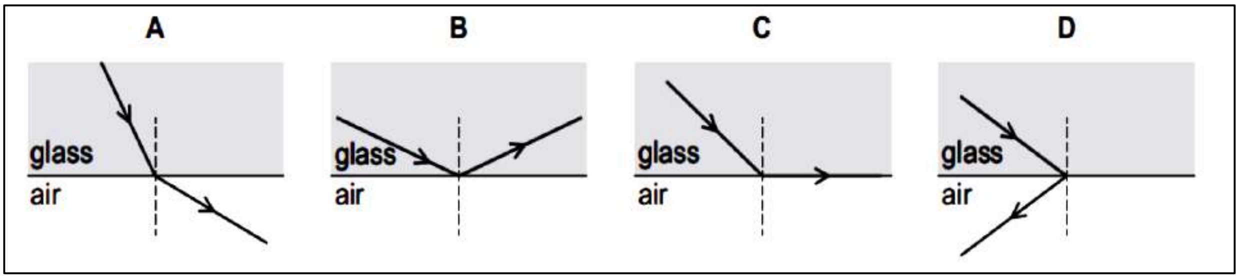
1. There are three types of mirrors that can be used to form images.

   I Plane mirror
   II Concave spherical mirror
   III Convex spherical mirror

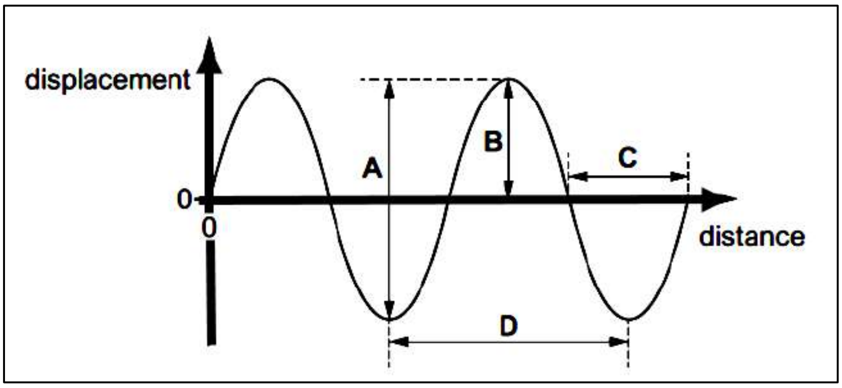
   A <u>virtual image</u> can be formed by which of the following (A, B, C or D)?

   A. I only
   B. III only
   C. I and II only
   D. All (I, II and III)

2. Light passes from glass into air.
   Which diagram shows a **ray of light incident** at the critical angle on the air-glass boundary?



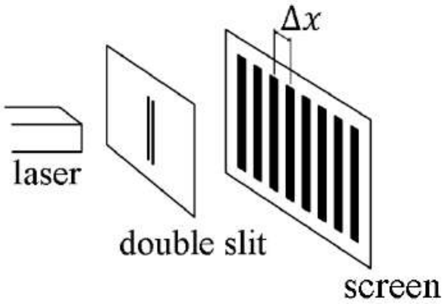
3. Which arrow on the graph labelled (A, B, C, or D) shows the **amplitude** of the wave?



4. Which of the following (A, B, C or D) demonstrates the **wave nature** of light?

   A. Colour of lights.
   B. The speed of light.
   C. Diffraction of light.
   D. The photoelectric effect.

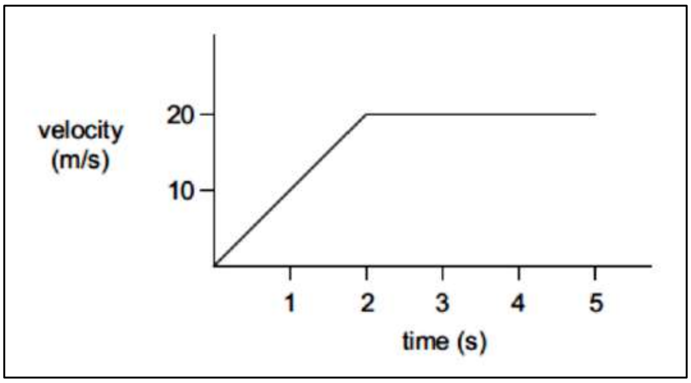
5. The **apparatus** in the diagram below shows the pattern of bright and dark bands observed on the screen.



   To increase the distance, Δx, between dark bands in this double slit interference pattern we have to decrease the;

   A. slit width.
   B. slit separation.
   C. slit-screen distance.
   D. wavelength of the light.

6.



   The graph above shows the motion of a toy car over a 5.0 seconds time interval. The **displacement** of the toy car over the time interval was;

   A. 20 m.
   B. 40 m.
   C. 60 m.
   D. 80 m.

7. Below are three lists of quantities:

   List I – Force, Acceleration, Velocity, Mass
   List II – Velocity, Displacement, Force, Momentum
   List III – Acceleration, speed, Force, velocity

   Which of the following (A, B, C or D) has all <u>vector</u> quantities?

   A. List I only.
   B. List II only.
   C. List III only.
   D. Lists II and III.

8. A car is moving in a straight line on a level road. Its engine provides a forward force on the car. A second force of equal size acts on the car due to resistive forces.

   Which statement describes what happens?

   A. The car speeds up.
   B. The car slows down.
   C. The car changes direction.
   D. The car moves at a constant speed.

9. A ball of mass ***(m)*** traveling horizontally with velocity (***v)*** strikes a massive vertical wall and rebounds back along its original direction with no change in speed.

   What is the **magnitude** of the impulse (change in momentum) delivered by the wall to the ball?

   A. $0\boldsymbol{mv}$
   B. $1\boldsymbol{mv}$
   C. $\frac{1}{2}\boldsymbol{mv}$
   D. $2\boldsymbol{mv}$

10. Below are three statements about **motion** in the Earth's gravitation field.

    I Acceleration due to gravity is always constant acting upwards
    II Acceleration due to gravity is always constant acting downwards
    III Acceleration due to gravity depends on the mass of the objects

    Which of the following (A, B, C or D) is TRUE?

    A. Statement I only.
    B. Statement II only.
    C. Statement III only.
    D. Statement I and III only.

11. How long will it take an arrow to reach the **highest point** of its trajectory if it is fired at 98.0 m/s at an angle of 30.0° to the horizontal?

    A. 2.50 s
    B. 5.00 s
    C. 7.50 s
    D. 10.0 s

12. Below are three statements about the motion of an object that moves at constant speed in a circular path.

    I. The velocity is constant.
    II. The acceleration is constant.
    III. The net force on the object is zero.

    Which of the following (A, B, C or D) is TRUE?

    A. Statement II only.
    B. Statements I and II only.
    C. Statements I and III only.
    D. Statements II and III only.

13. An electric kettle heats some water. The same kettle then heats a different liquid. The temperature of the liquid rises more rapidly than the temperature of the water. What is a possible explanation of this difference?

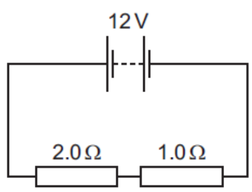
A. The liquid has a higher boiling point than the water.
B. The liquid expands more than the water as it heats up.
C. The liquid has a smaller specific heat capacity than the water.
D. The liquid condenses on the cooler parts of the kettle less than the water does.

14. When the volume occupied by gas particles in a container increases, the gas particles;

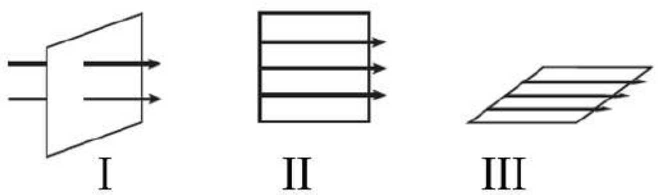
A. increase in temperature and increase in pressure.
B. decrease in kinetic energy and decrease in pressure.
C. increase in kinetic energy and increase in temperature.
D. decrease in temperature and increase in kinetic energy.

15. The circuit shows a 2.0 Ω resistor and a 1.0 Ω resistor connected to a 12 V battery. What is the **current** in the 2.0 Ω resistor?

A. 4.0 A
B. 6.0 A
C. 24 A
D. 36 A



16. A current loop is oriented in three different positions relative to a uniform magnetic field. In position **I** the plane of the loop is perpendicular to the field lines. In position **II** and **III** the plane of the loop is parallel to the field as shown below.



The **torque** on the loop is maximum in:

A. Position I only
B. Position II only
C. Position III only
D. Positions II and III

17. What would be the **strength** of the magnetic field around a 2.0 m cable carrying a 4.5A current? Use $\boldsymbol{k} = 2 \times 10^{-7}$ T.m/A.

A. 4.5×10^{-7} T
B. 9.0×10^{-7} T
C. 8.9×10^{-8} T
D. 9.0×10^{-8} T

18. A current will NOT be induced in a coil by;

A. holding one end of a bar magnet in the coil.
B. moving one end of a bar magnet through the coil.
C. moving the coil toward one end of the bar magnet.
D. holding a current-induced coil closer to a second coil.

19. When two small electric charges are held at a fixed separation, they exert a force of attraction on each other of 50.0 N. To obtain a force of 200 N, you have to;

A. halve the size of both charges.
B. double the size of one charge.
C. double the size of both charges.
D. double the distance of separation.

20. **Isotopes** of an element contain the;

A. same number of protons.
B. same number of neutrons.
C. different number of protons.
D. same number of protons and neutrons.

<u>Sect B</u>: **Q.1- Q.20**. Total marks	**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 2019

FOR MARKER USE ONLY			
QUESTION	**MARKS**	**MARKER**	**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			