

1. Diagram 1.1 shows a light copper rod is placed between two poles of a magnet. Current from the bare copper plate flows through the rod when the switch is closed.

Rajah menunjukkan satu rod kuprum ringan diletakkan diantara dua kutub magnet magnadur. Arus dari plat kuprum tak bertebat mengalir melalui rod apabila suis ditutup.

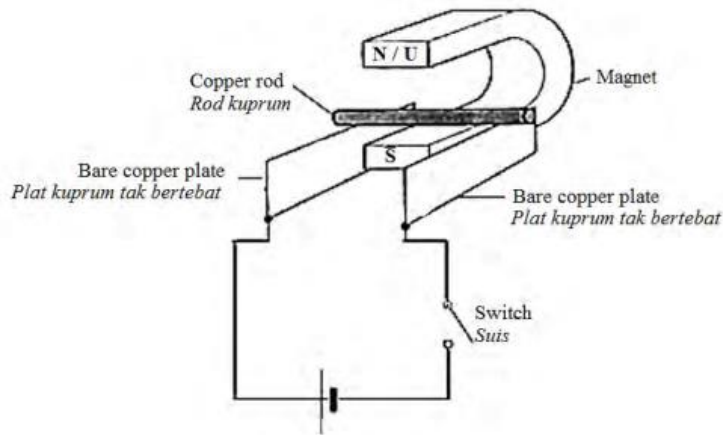


Diagram 1.1

- (a) (i) On Diagram 1.1, mark the direction of the current in the rod.  
 Pada Rajah 1.1, tandakan arah arus dalam rod. [1 mark]
- (ii) Determine the direction of the movement of rod.  
 Tentukan arah gerakan rod. [1 mark]
- (b) Name the physics' rule to determine the answer in 1(a)(ii).  
 Namakan peraturan fizik untuk menentukan jawapan dalam 1a(ii). 1 mark
- .....
- (c) State the effect on the movement of the rod when the current is increased.  
 Nyatakan kesan terhadap gerakan rod apabila arus ditambah. 1 mark
- .....

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- (d) Diagram 9.3 shows a spring toy gun.  
*Rajah 9.3 menunjukkan satu pistol mainan spring.*

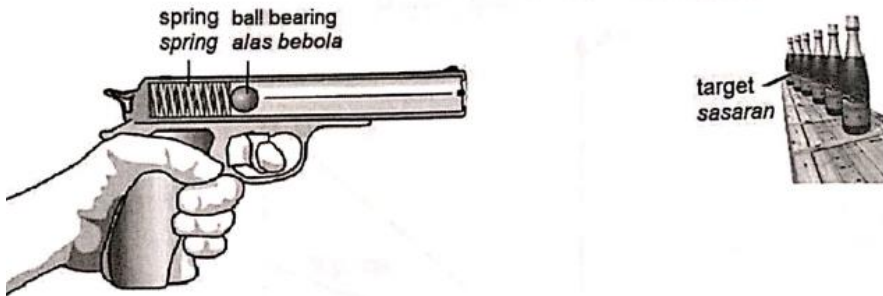


Diagram 9.3  
*Rajah 9.3*

The toy gun is unable to shoot a far distant target.  
Suggest modifications that can be made to the structure of the toy gun to enable the ball bearing to go further and hit the target more accurate.

State and explain the suggestions based on the characteristics of the spring and the ball bearing, and method to aim the target.

*Pistol mainan itu tidak boleh menembak sasaran yang jauh.  
Cadangkan pengubahsuaian yang boleh dibuat kepada struktur pistol mainan itu bagi membolehkan alas bebola pergi lebih jauh dan mengena sasaran dengan lebih tepat.*

*Nyata dan terangkan cadangan berdasarkan kepada ciri-ciri bagi spring dan alas bebola, dan kaedah untuk mengena sasaran.*



[10 marks]  
[10 markah]

5

7. Diagram 7.2 shows permanent magnets and a pair of current-carrying conductors. The current in the conductors flow in the opposite direction. Rajah 7.2 menunjukkan magnet kekal dan sepasang konduktor membawa arus. Arus dalam konduktor mengalir dalam arah yang bertentangan.



Diagram / Rajah 7.2

(i) Draw and label clearly the direction of the magnetic field lines and hence, the resultant force on the Diagram 7.2.

Lukis dan label dengan jelas arah garis medan magnet, dan seterusnya lukis daya paduan pada Rajah 7.2.

[3 marks / markah]

(ii) Name the resultant force that produced in Diagram 7.2.

Namakan daya paduan yang dihasilkan pada Rajah 7.2. [1 mark / markah]

(c) Suggest another method or rule that can be used to determine the direction of the resultant force produced in Diagram 7.2.

Cadangkan satu lagi kaedah atau peraturan yang dapat menentukan arah daya paduan yang dihasilkan pada Rajah 7.2.

..... [1 mark / markah]

(e) Suggest one modification to the copper coil that can increase the turning effect.

Cadangkan satu pengubahsuaian gegelung kuprum untuk membawa lebih arus untuk menambah kesan putaran.

..... [1 mark / markah]

1. Table A shows the characteristic of four designs of the aeroplane wings.

*Jadual A menunjukkan ciri-ciri bagi empat rekabentuk sayap kapal terbang.*




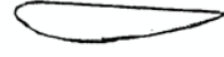
Wing Sayap	Shape of cross section of wing <i>Bentuk keratan rentas sayap</i>	Area of wing <i>Keluasan sayap/ m<sup>2</sup></i>	Density of wing material <i>Ketumpatan bahan sayap / kgm<sup>-3</sup></i>	Difference in speed of air above and below the wing <i>Perbezaan laju udara di antara bahagian atas dan bawah sayap / ms<sup>-1</sup></i>
W		38.0	2400	10.0
X		39.7	2300	21.8
Y		60.5	2000	20.0
Z		40.5	2050	15.5



Table A/ *Jadual A*

Study the characteristics of all four design of aeroplane wings.

Explain the suitability of each characteristic and determine the most suitable wing to be mounted with the body of the aeroplane.

Give reasons for your choice.

*Kaji ciri-ciri bagi keempat-empat rekabentuk sayap kapal terbang tersebut.*

*Terangkan kesesuaian setiap ciri dan tentukan sayap yang paling sesuai untuk dipasang bersama badan kapal terbang tersebut.*

*Beri sebab untuk pilihan anda.*

[10 marks]

[10 markah]

### Comparison Question

Diagram 10.1 shows the rate of decay of radioactive Xenon-133.

Diagram 10.2 shows the rate of decay of radioactive Iodine-131.

Rajah 10.1 menunjukkan kadar penyusutan radioaktif Xenon-133.

Rajah 10.2 menunjukkan kadar penyusutan radioaktif Iodin-131.

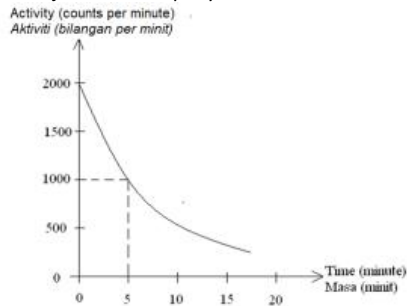


Diagram 10.1  
Rajah 10.1

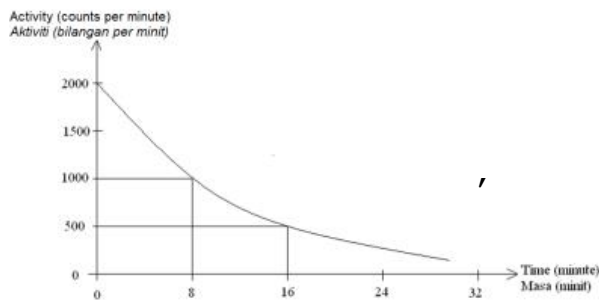


Diagram 10.2  
Rajah 10.2

Based on the Diagram 10.1 and Diagram 10.2, compare the shape of the graphs, the initial activity, the way the activity changes with time and the time taken for the activity to become half of the original activity.

Hence, name the time for the activity to become half of the original activity.

Berdasarkan Rajah 10.1 dan Rajah 10.2, bandingkan bentuk graf, aktiviti asal, aktiviti asal, cara aktiviti berubah mengikut masa dan masa yang diambil untuk aktiviti menjadi separuh daripada aktiviti asal.

Seterusnya, namakan masa untuk aktiviti menjadi separuh dari aktiviti asalnya. [ 5 marks]

### PHYSICS Workshop 2020

#### Tips for Paper 3 No 1 and No 2

1. Identify the variable from the text and diagram.
  - (a) Manipulated variable
  - (b) Responding variable
  - (c) Fixed variable (can be measured)---NOT TYPE OF SUBSTANCE

- (d) Observe the diagram measurement
  - (e) Identity the value in table
  - (f) Tabulate data with symbol and unit
  - (g) Plan your graph (unit and symbol)
  - (h) Determine the relationship from the graph
2. Read the question CAREFULLY
- (a) Extrapolate the graph and write the value next to it
  - (b) Plot biggest triangle and get closest value with unit
  - (c) Substitute the value correctly with 2 decimal places
  - (d) Place precaution
    - **Eye Observation perpendicular to the scale of (instrument) to prevent parallax errors**
    - Off the circuit when measurement is not taken to prevent heating of wires and cause systematic errors
    - **Repeat the experiment for 3 times and determine the average to prevent systematic error (NO LONGER VALID)**
3. **Tips Paper 3 no 3 and 4.**
- (a) Planning experiment is the BEST to do and EASY to score but it is also easy to differ from the main point.
  - (b) Identify variables from the questions from the statement, CIRCLE UP the variables involve and APPARATUS GIVEN in statement.
  - (c) Think what ??? experiment is using given apparatus as a HINTS. Plan and sketch the diagram of experiment step up.
  - (d) Write inference, hypothesis and aim FOLLOW FORMAT given.

**Underline the variables of MV and RV from the diagram. Use the variables to substitute the format of Planning Experiment.**

**Procedure**

1. State the initial measurement of MV.
2. State the ways of measurement of RV with apparatus and follow with formula (if necessary)
3. Repeat the experiment with 4 different MV values.  $a_1, a_2, a_3$  and  $a_4$ .

**Paper 2 Part B**

1. Definition – don't state the formula of the define word
  - Write the definition in statement from the formula
2. Comparison questions – must use back the same diagram to compare in physics term comparison. Quote back the Diagram number, and compare with statement according to the marks provision.
3. Explanation on aspects given.
  - Must quote back the aspect given, don't divert the statement by explaining other statement of your ways.
  - Explain the characteristics of the statement given follow ( 1 marks) with explanation of the benefit and advantages of the characteristics stated. (1 marks)
  - More explanation are better, usually TWO are more than enough.

**Part C**

1. Usually calculation, and definition.
  - Please state formula, working and final results with minimum 2 decimal places and correct units.
2. Explanation of physics concepts, usually test your understanding of physics formula relationships.
3. Study specification on the aspects given and evaluate the pictures given to extract the answer from the information given. Quote the information of point of answer and elaborate the statement of characteristics with physics concept explanation.
4. Try to give TWO explanation of each characteristics in a statement. (4 points with 4 explanation) – 8 marks
5. Final 2 marks is the explanation of the BEST suitability and CHOOSE the BEST of the 4 or 5 given examples.
6. This characteristics and explanation can states in a table form. (THE BEST EVER ESSAY for 10 marks)
7. Choose the best essay than you can get the MOST marks.
8. Essay in Part B and Part C is usually ONE form 4 and ONE form 5. So DON'T SPOT QUESTION. Study all the physics concept.

8. (a) Diagram 8.1 shows an electromagnet.  
*Rajah 8.1 menunjukkan satu elektromagnet.*

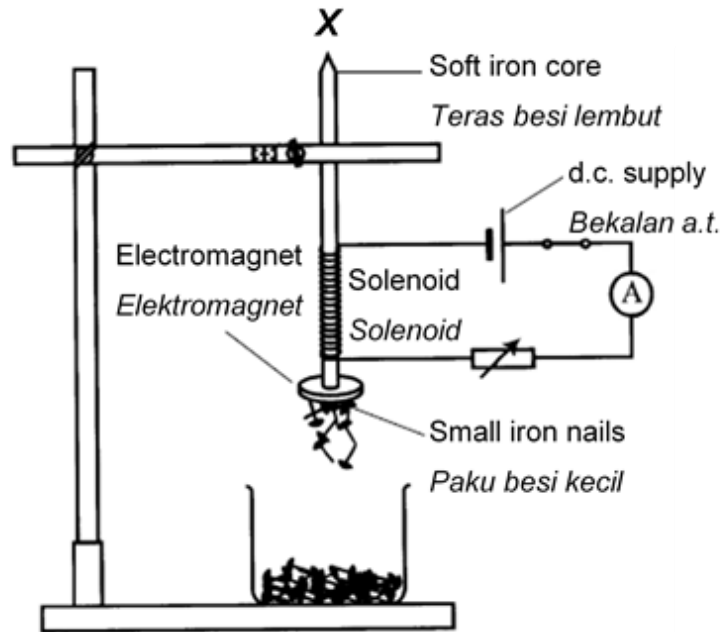




Diagram 8.1/ Rajah 8.1

- (i) Based on Diagram 8.1, name the rule used to determine the direction of current flows in the solenoid.

*Berdasarkan Rajah 8.1, namakan petua yang digunakan untuk menentukan arah arus mengalir dalam solenoid.* 

[1 mark / 1 markah]

- (ii) When the switch is turned on, current flows through the solenoid.  
 State the magnetic pole at X.

*Apabila suis dihidupkan, arus mengalir melalui solenoid.  
 Nyatakan kutub magnet pada X.* 

[1 mark / 1 markah]

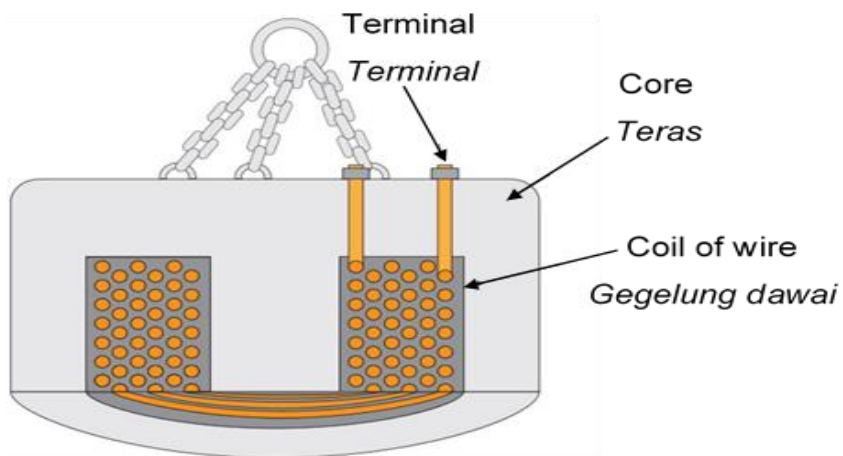
- (iii) If the battery terminals are reversed, state the magnetic pole at X.  
*Jika terminal bateri diterbalikkan, nyatakan kutub magnet pada X.*



[1 mark / 1 markah]

(b) Diagram 8.2 shows an electromagnet being used to lift scrap metals.

*Rajah 8.2 menunjukkan satu elektromagnet digunakan untuk mengangkat besi buruk.*



**Diagram 8.2 / Rajah 8.2**

Table 8 shows four different electromagnet, W, X, Y and Z.

*Jadual 8 menunjukkan empat elektromagnet yang berbeza, W, X, Y dan Z.*



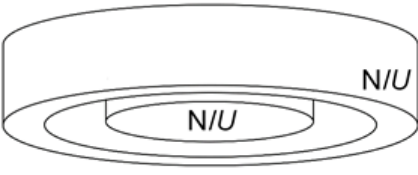
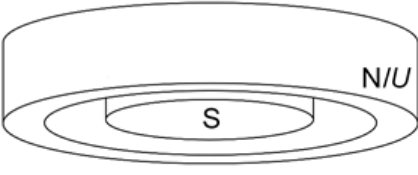
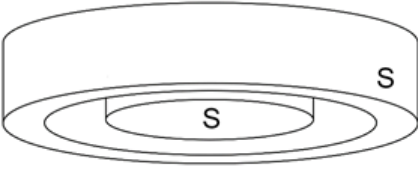
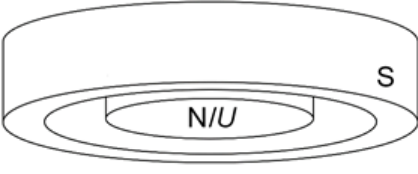

Electromagnet <i>Elektromagnet</i>	Type of core <i>Jenis teras</i>	Magnetic pole <i>Kutub magnet</i>	Number of turns <i>Bilangan lilitan</i>
W	Soft iron <i>Besi lembut</i>		Less <i>Kurang</i>
X	Steel <i>Keluli</i>		More <i>Banyak</i>
Y	Aluminium <i>Aluminium</i>		Less <i>Kurang</i>
Z	Soft iron <i>Besi lembut</i>		More <i>Banyak</i>


Table 8 *Jadual 8*

Based on Table 8, state the suitable characteristic of electromagnet to lift more numbers of scrap metals. Give **one** reason for the suitability of each characteristic.

*Berdasarkan Jadual 8, nyatakan ciri-ciri elektromagnet yang sesuai untuk mengangkat bilangan besi buruk yang banyak. Beri **satu** sebab bagi kesesuaian setiap ciri tersebut.*


- (i) Type of core:   
*Jenis teras:*


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Reason:   
*Sebab:*

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[2 marks / 2 markah]


- (ii) Magnetic pole:   
 Kutub magnet:
- 

Reason:   
 Sebab:

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[2 marks / 2 markah]

- (iii) Number of turns:   
 Bilangan lilitan:
- 

Reason:   
 Sebab:


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[2 marks / 2 markah]

- (iv) Based on the answer in **8(b)(i)**, **8(b)(ii)** and **8(b)(iii)**, determine the most suitable electromagnet to lift more numbers of scrap metal.  
 Berdasarkan jawapan di **8(b)(i)**, **8(b)(ii)** dan **8(b)(iii)**, tentukan elektromagnet yang paling sesuai untuk mengangkat bilangan besi buruk yang banyak.



[1 mark / 1 markah]

- (c) In Diagram 8.2, the electromagnet can lift 1800 kg mass to a height of 8.0 m in 4.5 second. Calculate the output power generated by the electromagnet.  
 Dalam Rajah 8.2, elektromagnet boleh mengangkat jisim 1800 kg ke 8.0 m ketinggian dalam 4.5 saat. Hitung kuasa output yang dihasilkan oleh elektromagnet. 

[2 marks / 2 markah]