



*PHYSICS IS EASY. PROVE IT!!*

# ***PHYSICS*** ***Workshop***

BELOVED  
SAB

5 July 22

JAWAB  
UNTUK SKOR  
A+ (JUSA)

0

## Physics JAWAB UNTUK SKOR A+ (JUSA)

### SPM KSSM 2021

- Paper 1 – 40 objectives – 1 hour 15 min
- Paper 2- 8 structures (60 marks) Format 456 99999  
and 3 Essay (part B – 2 choose 1) 20 marks  
(part C -1 compulsory) 20 marks  
2 hours 30 mins
- Paper Practical 1 questions (Random)– combination with chemistry and biology  
15 marks - 45 minutes (Solo)

#### Paper 1 (KSSM SPM)

##### Form 4

- 1- measurement
- 2-Force and motion 1
- 3- Gravitation
- 4-Heat
- 5- Waves
- 6- Light

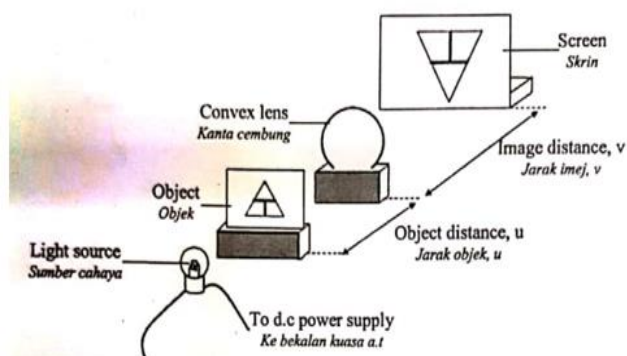
##### Form 5

- 1- Force and motion 2
- 2-Pressure
- 3- Electricity
- 4-Electromagnetism
- 5- Electronics
- 6- Nuclear Physics
- 7- Quantum Physics

### KSSM Objective

1.

4 Rajah menunjukkan satu susunan eksperimen untuk menyiasat hubungan antara jarak objek,  $u$  dan jarak imej,  $v$ .



Graf manakah yang menunjukkan hubungan antara  $v$  dan  $u$  yang betul?

Diagram show an arrangement of an experiment to investigate the relationship between object distance,  $u$  and image distance,  $v$ .

Which of the following statement true about the above experiment?

	Manipulated variable	Constant variable	Responding variable
A	Image distance	Power of lens	Object distance
B	Power of lens	Object distance	Image distance
C	Object distance	Power of lens	Image distance
D	Type of lens	Power of lens	Image distance

2.

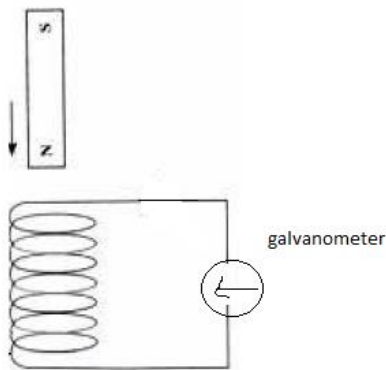


Diagram show an arrangement of an experiment to investigate the Faraday's Law.

Which of the following statement true about the above experiment?

	Manipulated variable	Constant variable	Responding variable
A	Height of magnet drop into solenoid	Induced current	Number of turns
B	Height of magnet drop into solenoid	Number of turns	Induced current
C	Number of turns	Height of magnet drop into solenoid	Induced current
D	Induced current	Number of turns	Height of magnet drop into solenoid

3. Based on the importance of knowing the values of gravitational acceleration of the planets in the Solar System, which of statement is correct about the effects of gravity on human growth?

- A. difference in age
- B. numbers of bones
- C. mass of lungs
- D. blood circulation system and blood pressure

4. Which device can be use to measure the value of Planck's constant?

- A. Manometer
- B. Electron High tension
- C. Planck's constant kit
- D. Planck's constant ratemeter

5. Johannes Kepler, a German astronomer whom had formulated laws that describe the movement of planets around the Sun which explains

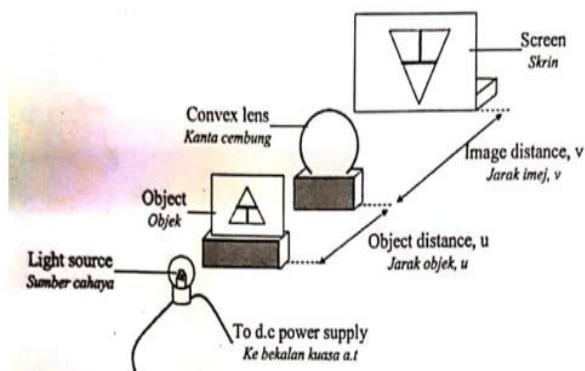
- I. all planets move in elliptical orbits, with the sun at one focus (Law of Orbits).
- II. a line that connects a lanet to the sun sweeps out equal areas in equal times (Law of Areas).
- III. the square of the period of any planet is directly proportional to the square of the radius of its orbit (Law of Periods).

- A. I and II only
- B. I and III only
- C. II and III only

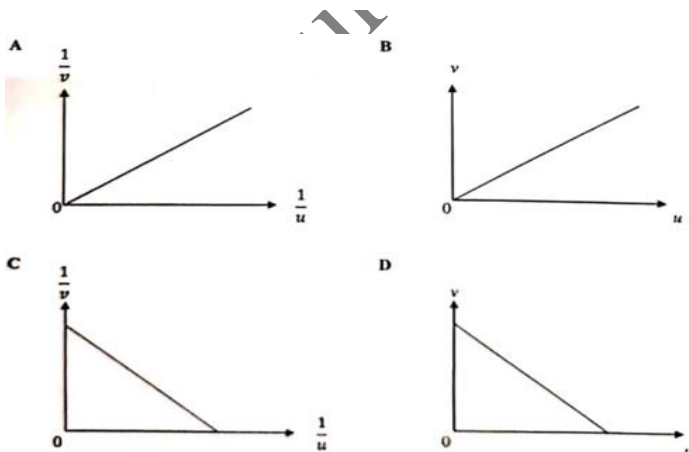
6. Diagram show an arrangement of an experiment to investigate the relationship between object distance,  $u$  and image distance,  $v$ .

Which of the following graph show the correct relationship between  $v$  and  $u$  true?

4 Rajah menunjukkan satu susunan eksperimen untuk menyiasat hubungan antara jarak objek,  $u$  dan jarak imej,  $v$ .



Graf manakah yang menunjukkan hubungan antara  $v$  dan  $u$  yang betul?



**Paper 2 KSSM**

**Structures (60 marks)**

1.

Newton's Universal Law of Gravitation states that the gravitational force between two bodies is directly proportional to the products of the masses of both bodies and inversely proportional to the square of the distance between the centres of the two bodies,  $F = \frac{Gm_1m_2}{r^2}$ .

While according to Newton's Second Law of Motion, gravitational force,  $F = mg$ .

*Hukum Kegravitian Semesta Newton menyatakan bahawa daya graviti antara dua jasad adalah berkadar terus dengan hasil darab jisim kedua-dua jasad dan berkadar songsang dengan kuasa dua jarak di antara pusat dua jasad tersebut,  $F = \frac{Gm_1m_2}{r^2}$ . Manakala, menurut Hukum Gerakan Newton Kedua, daya gravity,  $F = mg$ .*

(a) What is the relationship between gravitational acceleration with the square of distance between the centres of the two bodies?

*Apakah hubungan antara pecutan graviti dengan kuasa dua jarak di antara pusat dua jasad tersebut?*



[1 mark/ 1 markah]

(b) Complete the following sentence by ticking (✓) the correct answer.

*Lengkapkan ayat berikut dengan menandakan (✓) jawapan yang betul.*

Centripetal force is the force acts on the body in a direction towards the centre of the circle and the equation for centripetal force is

*Daya memusat ialah daya yang bertindak keatas jasad yang sentiasa menuju ke pusat bulatan dan persamaan untuk daya memusat ialah*

$$F = \frac{mv^2}{r}$$

$$F = \frac{mv}{r^2}$$

[1 mark/ 1 markah]

(c) based on the equation on (b) above, state the representation of v and r if a satelit is orbiting the Earth.

*berdasarkan persamaan pada (b) di atas, nyatakan perwakilan untuk v dan r jika sebuah satelit mengorbit mengelilingi Bumi.*



v = \_\_\_\_\_

r = \_\_\_\_\_

[2 mark/ 2 markah]

2.

The label on electric kettle is marked 240 V , 3 kW. The kettle contains 1.7 kg of water at 20 °C. It takes 3.5 minutes to raise the temperature of the water to 100 °C.

[ Specific heat capacity of water is  $4.2 \times 10^3 \text{ J kg}^{-1} \text{ } ^\circ\text{C}^{-1}$ ,  
specific latent heat of vaporization of water  $2.3 \times 10^6 \text{ J kg}^{-1}$  ]

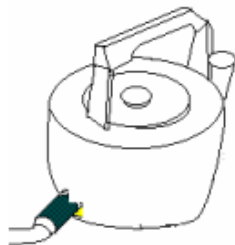


Diagram 5  
Rajah 5

SSS.COM

Sebuah cerek dilabelkan sebagai 240 V , 3 kW. Cerek mengandungi 1.7 kg air pada suhu 20 °C. Selama 3.5 minit masa diperlukan untuk meningkatkan suhu air sehingga 100 °C.

[Muatan haba tentunya ialah  $4.2 \times 10^3 \text{ J kg}^{-1} \text{ } ^\circ\text{C}^{-1}$ , haba pendam tentu pengewapan air  $2.3 \times 10^6 \text{ J kg}^{-1}$  ]



- (a) What is meant by specific heat capacity?  
Apakah yang dimaksudkan dengan muatan haba tentu?



.....  
.....

[ 2 marks ]  
[2 markah]

- (b) Calculate  
Kira  
(i) the energy output of the electric kettle in 3.5 minutes,  
tenaga yang dikeluarkan dari cerek dalam masa 3.5 minit



[ 2 marks ]  
[2 markah]

- (ii) the energy required to raise the temperature of 1.7 kg of water from  $20^{\circ}\text{C}$  to  $100^{\circ}\text{C}$ .  
*tenaga yang diperlukan untuk meningkatkan suhu bagi 1.7 kg air dari  $20^{\circ}\text{C}$  ke  $100^{\circ}\text{C}$ .*



[ 2 marks ]  
 [2 markah]

- (iii) the energy required to boil away 0.23 kg of water at  $100^{\circ}\text{C}$ .  
*tenaga yang diperlukan untuk mendidihkan 0.23 kg air pada  $100^{\circ}\text{C}$*



[ 2 marks ]  
 [2 markah]

- (c) what is the meant by an electric kettle label 240V, 3 kW?

Apakah yang dimaksudkan dengan cerek elektrik dilabel 240V, 3 kW? [1marks/ 1markah]

3.

Alia uses a convex lens to help her to see clearly while removing a wood splinter from her thumb.

*Alia menggunakan sebuah kanta cembung untuk membantunya melihat dengan lebih jelas semasa mengeluarkan serpihan kayu kecil daripada ibu jarinya.*

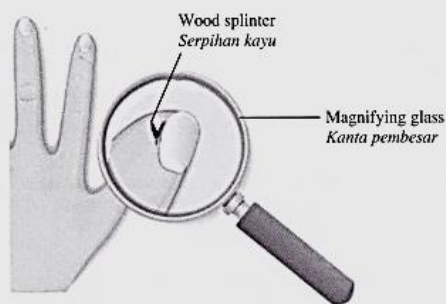


Diagram 4.1  
 Rajah 4.1

- (a) Tick ✓ for the correct answer.  
*Tandakan ✓ bagi jawapan yang betul.*

Convex lens can .....  
*Kanta cembung boleh .....*

- converge the light  
*menumpukan cahaya*
- diverge the light  
*mencapah cahaya*

[1 mark]

- (b) The focal length of the lens used is 5.0 cm.  
On Diagram 4.2, draw a ray diagram to show how the image in Diagram 4.1 is formed.

*Panjang fokus kanta yang digunakan ialah 5.0 cm.*

*Pada Rajah 4.2, lukis satu rajah sinar untuk menunjukkan bagaimana imej dalam Rajah 4.1 terbentuk.*

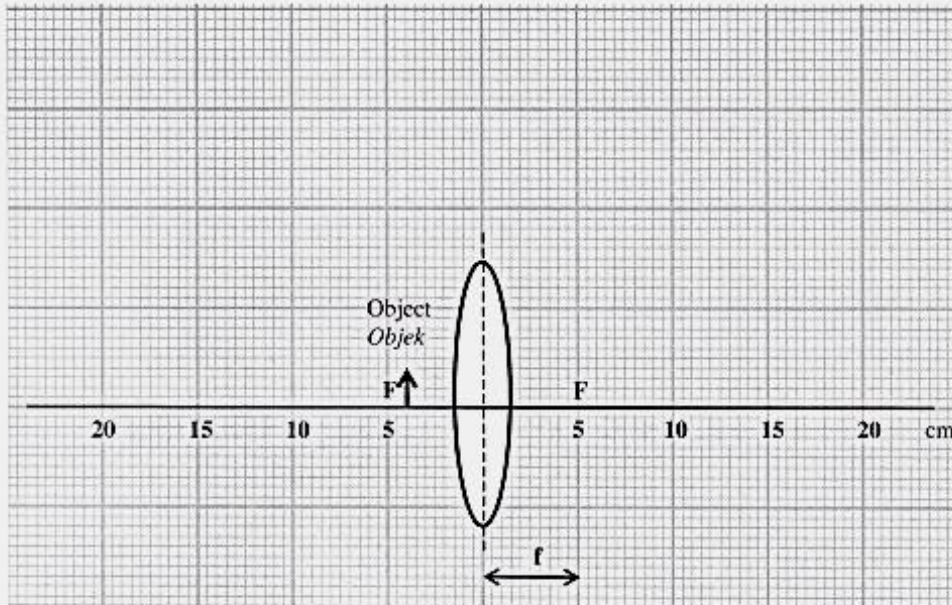


Diagram 4.2  
Rajah 4.2

[3 marks]  
[3 markah]

- (c) Determine the linear magnification of the lens.  
*Tentukan pembesaran linear kanta tersebut.*



[2 marks]  
[2 markah]



4.

Diagram 5.1 shows a boy rocking an elastic spring rocker.  
Diagram 5.2 shows the same boy rocking on another spring rocker.  
Both spring rockers used identical springs.

Rajah 5.1 menunjukkan seorang budak lelaki bermain rocker spring yang kenyal.  
Rajah 5.2 menunjukkan budak lelaki yang sama bermain rocker spring yang lain.  
Kedua-dua rocker spring tersebut menggunakan spring yang sama.



Diagram 5.1  
Rajah 5.1



Diagram 5.2  
Rajah 5.2

- (a) What is the meaning of elasticity?  
*Apakah yang dimaksudkan dengan kekenyalan?*

.....

[1 mark]  
[1 markah]

- (b) Observe Diagram 5.1 and 5.2, compare;  
*Berdasarkan Rajah 5.1 dan 5.2, bandingkan;*

- (i) the number of springs.  
*bilangan spring.*

.....

[1 mark]  
[1 markah]

- (ii) the compression of the springs.  
*pemampatan spring.*

.....

[1 mark]  
[1 markah]

- (iii) the stiffness of the springs.  
*kekerasan spring.*

.....  
[1 mark]  
[1 markah]

- (iv) Relate the number of spring and the compression of the spring.  
*Hubungkan bilangan spring dengan pemampatan spring.*

.....  
[1 mark]  
[1 markah]

- (v) Relate the stiffness and the compression of the spring.  
*Hubungkan antara kekerasan dengan pemampatan spring.*

.....  
[1 mark]  
[1 markah]

- (c) Which spring rocker can support children with greater mass?  
Explain your answer.

*Rocker spring yang manakah mampu menampung kanak-kanak yang lebih berat?  
Terangkan jawapan anda.*

.....  
.....

[2 marks]  
[2 markah]

5.

1.

Diagram 7 shows a tyre of a car that is going to be used to travel from Kuala Lumpur to Kuala Terengganu.

Rajah 7 menunjukkan sebiji tayar kereta yang digunakan untuk perjalanan dari Kuala Lumpur ke Kuala Terengganu.



Diagram 7  
Rajah 7

(a) After the long journey,  
*Selepas satu perjalanan yang jauh,*

(i) what happen to the temperature of the air in the tyre  
*apakah yang berlaku kepada suhu udara di dalam tayar.*



.....  
[1 mark]

(ii) state one other physical quantity that will also change.  
*nyatakan satu kuantiti fizik lain yang turut berubah.*



..... [1 mark]

(b) Based on the answers in (a) (i) and (a) (ii), name the gas law involve.  
*Berdasarkan jawapan dalam (a) (i) dan (a) (ii), namakan hukum gas yang terlibat.*



..... [1 mark]

c) Before a long journey, the driver checked the air pressure of his car tyres. The air pressure of the tyres was 200 kPa at a temperature 27°C. After the journey, the air pressure of the tyres was found to have increased to 230 kPa. What is the temperature of the air in the tyre after the journey? [Assume the volume of the tyre is constant]



[2 marks]

- (d) The tyre in Diagram 7 is not suitable to be used on a muddy road. Suggest modifications to be done based on the characteristics given.  
*Tayar di dalam Rajah 7 tidak sesuai digunakan di atas jalan berlumpur. Cadangkan pengubahsuaian yang perlu dilakukan berdasarkan ciri-ciri yang diberi.*



- (i) Surface area of the tyre  
*Luas permukaan tayar*

..... [1 mark]

- (ii) Reason  
*Sebab*

..... [1 mark]

- (iii) The track of the tyre  
*Alur pada tayar*



..... [1 mark]

- (iv) Reason  
*Sebab*

..... [1 mark]

- (v) The pressure of the tyre  
*Tekanan dalam tayar*



..... [1mark]

- (vi) Reason / *Sebab*

..... [1mark]

**ESSAY Part B**

1



- (a) Apakah yang dimaksudkan dengan kerintangan dawai?  
 What is meant by resistivity of a conductor?

[1 mark]

- (b) Tentukan fuis yang sesuai bagi cerek bertanda 240V, 800W (Pilihan fuis adalah 1A, 3A, 5A, 8A atau 13A)

Determine an appropriate fuis for a kettle that is marked 240V, 800W.



- ( choice of fuis is 1A, 3A, 5A, 8A atau 13A)

[ 2 marks].

- (c)

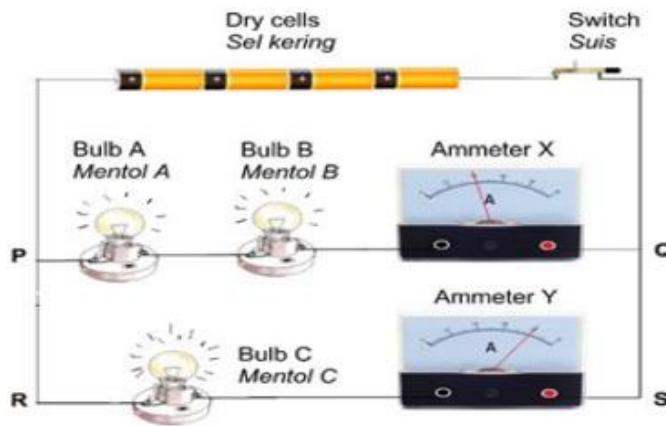


Diagram 10.1  
Rajah 10.1

Diagram 10.1 shows an electrical circuit consist of three identical bulbs. Two bulbs and an ammeter are placed across PQ. A bulb and an ammeter are placed across RS. Assume the internal resistance of the dry cells is zero.  
Rajah 10.1 menunjukkan litar elektrik mengandungi tiga mentol yang serupa. Dua mentol dan ammeter diletakkan merentasi PQ. Satu mentol dan ammeter diletakkan merentasi RS. Anggap rintangan dalam sel kering adalah sifar.

A piece of copper wire is connected across Bulb B in Diagram 10.1.

Seutas dawai kuprum disambung merentasi Mentol B dalam Rajah 10.1.

Explain what happens to the ammeter readings and brightness of the bulbs.

Terangkan apakah yang berlaku kepada bacaan ammeter dan kecerahan mentol. [4 marks]

(d)

Table 11.2 shows design of four pressure cookers and their characteristics.

Jadual 11.2 menunjukkan rekabentuk bagi empat periuk tekanan dan cirri-cirinya.

You are required to determine the most suitable specifications for a design of a pressure cooker. Explain the suitability of each specification. Choose the most suitable pressure cooker and give reasons for your choice.

Anda dikehendaki menentukan spesifikasi yang paling sesuai untuk merekabentuk sebuah periuk tekanan. Terangkan kesesuaian setiap spesifikasi. Pilih periuk tekanan yang paling sesuai dan beri sebab untuk pilihan anda. [10 marks]

Model	Characteristics of the model Ciri-ciri model
P	<div style="display: flex; justify-content: space-between;"> <div style="width: 30%;"> <p>Without sealing ring Tanpa gelung pengetat</p> <p>1 layer 1 lapisan</p> </div> <div style="width: 40%; text-align: center;"> </div> <div style="width: 30%;"> <p>Without release valve Tanpa injap pelepas</p> <p>Iron pot Periuk besi</p> </div> </div>
Q	<div style="display: flex; justify-content: space-between;"> <div style="width: 30%;"> <p>Steel pot Periuk keluli</p> </div> <div style="width: 40%; text-align: center;"> </div> <div style="width: 30%;"> <p>Release valve Injap pelepas</p> <p>Sealing ring Gelung pengetat</p> <p>Multilayer Banyak lapisan</p> </div> </div>

R	
S	

Table 11.2  
Jadual 11.2

(e) Selain daripada spesifikasi periuk tekanan yang diberikan dalam Jadual di atas, cadangkan satu faktor lain bagi periuk tekanan tersebut untuk membolehkan periuk tekanan tersebut digunakan dengan selamat. Beri satu sebab.

Apart of the specification of the pressure cooker given in Table above, suggest another one factor for the pressure cooker to enable it to be used safely. Give a reason. [2 marks]

### Part c

Esei

1 Diagram 1 shows the formation of the image of an object by a lens X. In Diagram 2, another lens, Y, is used to form the image of the same object. *Rajah 1 menunjukkan pembentukan imej bagi suatu objek oleh kanta X. Dalam Rajah 2, satu lagi kanta, Y, digunakan bagi membentuk imej bagi objek yang sama.*

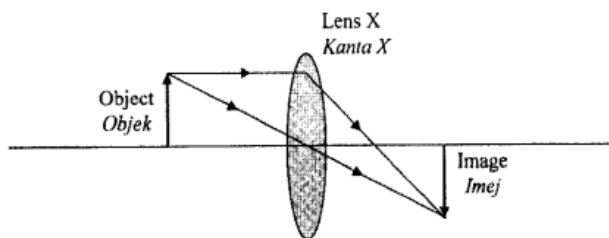


Diagram 1 / Rajah 1

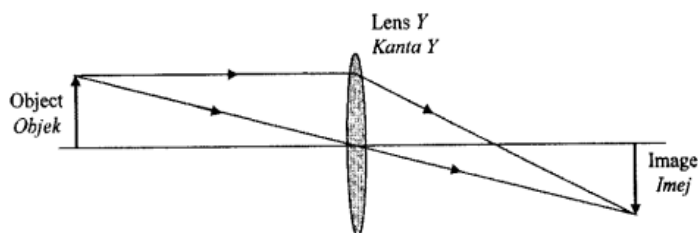


Diagram 2 / Rajah 2

1(a) For each case, compare;

Bagi setiap kes, bandingkan ;

(i) the size of the object and the size of the image  
saiz objek dan saiz imej

(ii) the object distance and the image distance

jarak objek dan jarak imej

[2 marks]

(b) (i) Compare the focal length of lens X and lens Y  
Bandingkan panjang fokus kanta X dan kanta Y.

(ii) Compare the thickness of lens X and lens Y.

Bandingkan ketebalan kanta X dan kanta Y.

(iii) Relate the focal length with the thickness of the lens.

Hubungkan panjang fokus kanta dengan ketebalannya.

[3 marks]

1(c) what is the unit for the power of the lenses?

[1mark]

(d)



Diagram above show a technician using magnifying glass to assist him to fix the circuit board. The magnifying glass will magnified the board image.

Using the diagram to explain how the image forms. In your explanation, state the characteristics of the image.

Rajah atas menunjukkan seorang juru teknik menggunakan lampu pembesar untuk membantunya membaiki sebuah papan litar. Lampu pembesar itu menggunakan sebuah kanta untuk memperbesarkan imej litar itu.

Dengan menggunakan rajah, terangkan bagaimana imej terbentuk. Dalam penerangan anda, nyatakan ciri-ciri imej itu.

[4 marks]

(e) Diagram 9.3 shows a simple solar water–heating system. Energy from the Sun falls on the solar panel. Water is pumped around the system so that a store of hot water is made available in the tank.

*Rajah 9.3 menunjukkan satu sistem pemanasan air yang ringkas. Tenaga dari matahari memancar ke atas panel solar. Air dipam mengelilingi sistem itu supaya simpanan air panas tersedia di dalam tangki.*

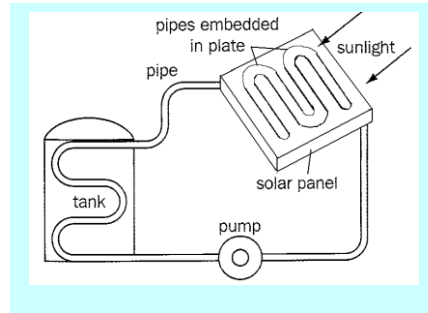


DIAGRAM 9.3

Using suitable physics concepts, explain the required **modification** needed in designing an efficient solar water-heating system. The modification should include the following aspects:

*Dengan menggunakan konsep fizik yang sesuai, terangkan pengubahsuaian yang diperlukan dalam mereka bentuk sistem pemanasan air solar yang cekap. Pengubahsuaian hendaklah mengikut aspek-aspek berikut:*

(i) **pipes design**  
*rekabentuk paip*

(ii) **material used**  
*bahan yang digunakan*

(iii) **heat absorption** / *penyerapan haba*

[10 marks]

[The END]

- (c) Diagram 9.3 shows Hazim is driving a hydrofoil boat in a lake. As the boat moves, the hydrofoil lift the boat's hull out of the water surface due to its foil attached underneath the boat, hence increase the speed of the boat.

Explain how hydrofoil lifts the boat to increase its speed.

*Rajah 9.3 menunjukkan Hazim memandu sebuah bot hidrofoil di sebuah tasik. Apabila bot bergerak, hidrofoil mengangkat badan bot keluar dari permukaan air disebabkan oleh penghadang yang dipasang dibawahnya, seterusnya meningkatkan kelajuan bot.*

*Terangkan bagaimana hidrofoil boleh mengangkat bot dan meningkatkan kelajuannya.*

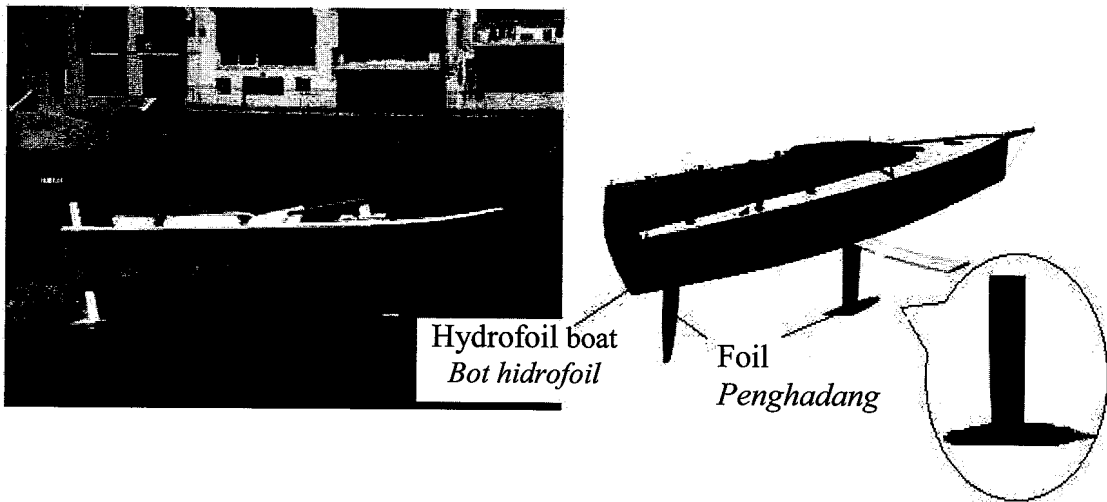


Diagram 9.3  
Rajah 9.3

[4 marks]  
[4 markah]

- (d) Diagram 9.4 shows a snorkeling suit and equipment set.  
*Rajah 9.4 menunjukkan pakaian dan peralatan snorkel.*

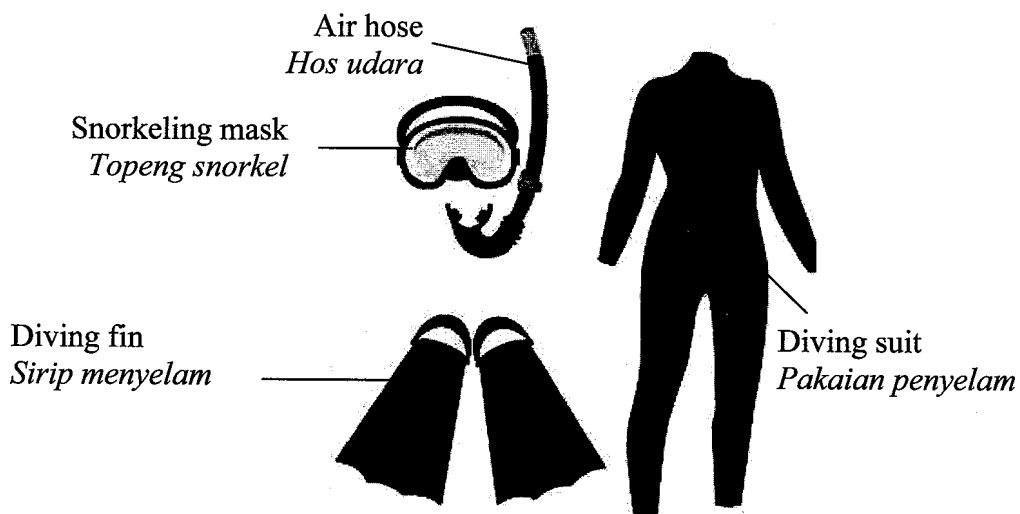


Diagram 9.4  
Rajah 9.4



The diving suit and equipment in Diagram 9.4 are not suitable to be used for deep sea diving.



Based on your knowledge in pressure, buoyant force and properties of material, you are required to suggest some modifications so that the diver can dive safely in deep sea.

State and explain your suggestions based on the characteristic of the diving suit, the diving equipment and other safety features.

*Pakaian dan peralatan menyelam dalam Rajah 9.4 tidak sesuai digunakan untuk menyelam di laut dalam.*

*Menggunakan pengetahuan anda tentang tekanan, daya apungan dan sifat-sifat bahan, anda diminta untuk mencadangkan beberapa pengubahsuaian supaya penyelam boleh menyelam di laut dalam dengan selamat.*

*Nyatakan dan terangkan cadangan anda berdasarkan ciri bagi pakaian menyelam, peralatan menyelam dan ciri keselamatan.*

[10 marks]

[10 markah]

[Lihat halaman sebelah

**SULIT**