

Nama : .....

Tingkatan : .....

4531/2

**SULIT**

4531/2

Physics

Fizik

Paper 2

Kertas 2

Okt

2007

2  $\frac{1}{2}$

hours

**JABATAN PELAJARAN TERENGGANU**

*DENGAN KERJASAMA*

PERSIDANGAN KEBANGSAAN PENGETUA

SEKOLAH MENENGAH MALAYSIA

CAWANGAN TERENGGANU

**PEPERIKSAAN AKHIR TAHUN 2007  
TINGKATAN 4**

**PHYSICS**

**FIZIK**

Paper 2

Kertas 2

Two hours and thirty minutes

*Dua jam tiga puluh minit*

**JANGAN BUKA KERTAS SOALAN INI  
SEHINGGA DIBERITAHU**

1. *Tuliskan nama dan tingkatan anda pada ruang yang disediakan.*
2. *Calon dikehendaki membaca maklumat di halaman 2.*

Bahagian	Soalan	Markah Penuh	Markah Diperoleh
A	1	4	
	2	5	
	3	6	
	4	7	
	5	8	
	6	8	
	7	10	
	8	12	
B	9	20	
	10	20	
C	11	20	
	12	20	
<b>Jumlah</b>			

Kertas soalan ini mengandungi 27 halaman bercetak

[Lihat sebelah  
**SULIT**

## INFORMATION TO CANDIDATES

- 1 *This question paper consists of the **three** section: **Section A**, **Section B** and **Section C**.*
- 2 *Answer all question in Section A . Write your answer for Section A in the spaced provided on the question paper.*
- 3 *Answer **one** question from **Section B** and **one** question from **Section C**. Write your answer for Section B and Section C on the lined pages at the end of this question paper. Answer question in **Section B** and **Section C** in detailed. You may use equations, diagrams, tables, graphs and other suitable method to explain your answer.*
- 4 *Show your working, it may help you to get marks.*
- 5 *If you to cancel any answer neatly cross out the answer.*
- 6 *The diagrams in the questions provided are not drawn to scale unless stated.*
- 7 *A list of formulae in provided on page 4.*
- 8 *The marks allocated for each question or part question are shown in brackets.*
- 9 *The time suggested to complete **Section A** is 90 minutes, **Section B** is 30 minutes and **Section C** is 30 minutes.*
- 10 *You may use non-programmable scientific calculator.*
- 11 *Hand in all your answer sheets at the end of the examination.*

## MAKLUMAT UNTUK CALON

1. *Kertas soalan ini mengandungi tiga bahagian : Bahagian A, Bahagian B dan Bahagian C.*
2. *Jawab semua soalan daripada Bahagian A. Jawapan kepada Bahagian A hendaklah ditulis dalam ruang yang disediakan dalam kertas soalan.*
3. *Jawab satu soalan daripada Bahagian B dan satu soalan dalam Bahagian C. Jawapan kepada Bahagian B dan Bahagian C hendaklah ditulis dalam ruang bergaris yang disediakan di bahagian akhir kertas soalan ini. Anda diminta menjawab dengan lebih terperinci untuk Bahagian B dan Bahagian C. Jawapan mestilah jelas dan logik. Persamaan, gambar rajah, jadual, graf dan cara lain yang sesuai untuk menjelaskan jawapan anda boleh digunakan.*
4. *Tunjukkan kerja mengira, ini membantu anda mendapatkan markah.*
5. *Sekiranya anda hendak membatalkan sesuatu jawapan, buat garisan di atas jawapan itu.*
6. *Gambar rajah yang mengiringi soalan tidak dilukis mengikut skala kecuali dinyatakan.*
7. *Satu senarai rumus disediakan di halaman 5.*
8. *Markah yang diperuntukkan bagi setiap soalan atau ceraihan soalan ditunjukkan dalam kurungan*
9. *Masa yang dicadangkan untuk menjawab Bahagian A ialah 90 minit, Bahagian B ialah 30 minit dan Bahagian C ialah 30 minit.*
10. *Anda dibenarkan menggunakan kalkulator saintifik yang tidak boleh deprogramkan.*
11. *Serahkan semua kertas jawapan di akhir peperiksaan.*

The following information may be useful. The symbols have their usual meaning  
Maklumat berikut mungkin berfaedah. Simbol-simbol mempunyai makna yang biasa.

$$1. \quad a = \frac{v - u}{t}$$

$$2. \quad \text{Momentum} = mv$$

$$3. \quad F = ma$$

$$4. \quad \text{Potential energy} = mgh$$

$$5. \quad \text{Kinetic energy} = \frac{1}{2}mv^2$$

$$6. \quad \rho = \frac{m}{v}$$

$$7. \quad \text{Pressure, } p = \frac{F}{A}$$

$$8. \quad \text{Pressure, } p = h\rho g$$

$$9. \quad \text{Heat, } Q = mc\theta$$

$$10. \quad \frac{pV}{T} = \text{constant}$$

$$11. \quad E = mc^2$$

$$12. \quad v = f\lambda$$

$$13. \quad \frac{1}{f} = \frac{1}{u} + \frac{1}{v}$$

$$14. \quad n = \frac{\sin i}{\sin r}$$

$$15. \quad v^2 = u^2 + 2as$$

$$16. \quad s = ut + \frac{1}{2}at^2$$

$$17. \quad \text{Power, } P = \frac{\text{work}}{\text{time}}$$

$$18. \quad g = 9.8 \text{ m s}^{-2}$$

$$1. \quad a = \frac{v - u}{t}$$

$$2. \quad \text{Momentum} = mv$$

$$3. \quad F = ma$$

$$4. \quad \text{Tenaga keupayaan} = mgh$$

$$5. \quad \text{Tenaga kinetik} = \frac{1}{2}mv^2$$

$$6. \quad \rho = \frac{m}{v}$$

$$7. \quad \text{Tekanan, } p = \frac{F}{A}$$

$$8. \quad \text{Tekanan, } p = h\rho g$$

$$9. \quad \text{Haba, } Q = mc\theta$$

$$10. \quad \frac{pV}{T} = \text{pemalar}$$

$$11. \quad E = mc^2$$

$$12. \quad v = f\lambda$$

$$13. \quad \frac{1}{f} = \frac{1}{u} + \frac{1}{v}$$

$$14. \quad n = \frac{\sin i}{\sin r}$$

$$15. \quad v^2 = u^2 + 2as$$

$$16. \quad s = ut + \frac{1}{2}at^2$$

$$17. \quad \text{Kuasa, } P = \frac{\text{tenaga}}{\text{masa}}$$

$$18. \quad g = 9.8 \text{ m s}^{-2}$$

## Section A

[60 marks]

Answer **all** questions in this sectionThe time suggested to complete this section is **90** minutes

- 1 Diagram 1.1 shows a ruler measuring the length of a rod. **P, Q and R** are the three eye position for reading the scale of the ruler.

Rajah 1.1 menunjukkan satu pembaris yang digunakan untuk mengukur panjang satu rod. **P, Q dan R** adalah tiga kedudukan mata semasa membuat bacaan pembaris itu.

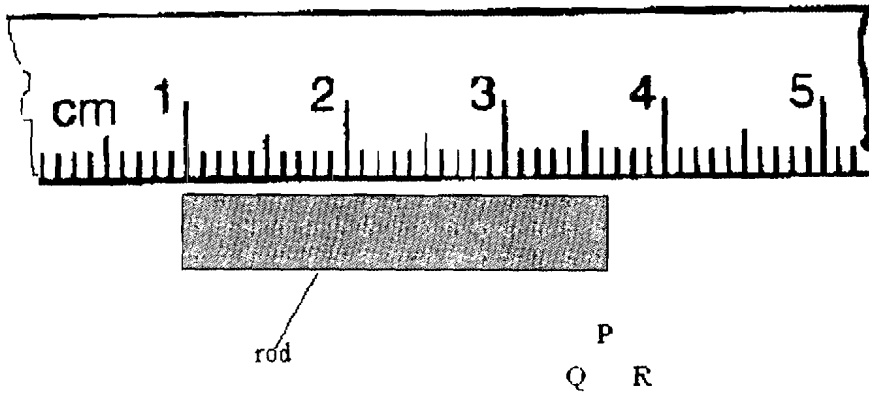


DIAGRAM 1.1

- (a)(i) Which position of the eye is correct when taking the reading of the length of the rod?  
Manakah kedudukan mata yang betul semasa mengambil bacaan?

..... [1 mark]

- (ii) Give one reason for the answer in (a) (i).  
Beri sebab jawapan anda dalam (a)(i)

..... [1 mark]

- (b)(i) What is the length of the rod?  
Berapakah panjang rod itu?

..... [1 mark]

- (ii) Give an another instrument for measuring the diameter of the rod  
Berikan satu alat lain yang boleh digunakan untuk mengukur diameter rod itu

..... [1 mark]

- 2 Diagram 2.1 shows a laboratory thermometer.  
*Rajah 2.1 menunjukkan sebuah termometer makmal.*

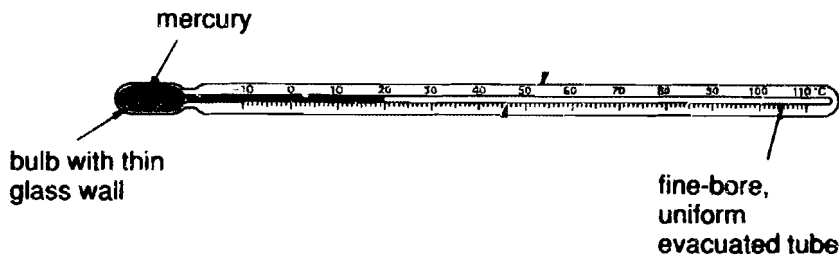


DIAGRAM 2.1

- (a) (i) Why the bulb is made with thin glass wall?  
*Mengapa bebuli dibuat dengan dinding yang nipis?*
- .....  
 [1 mark]
- (ii) Why is the bore of the capillary tube is made fine and uniform?  
*Mengapa batang tuib kapilari dibuat halus dan sekata?*
- .....  
 [1 mark]
- (b) A mercury glass thermometer is immersed in melting ice and the length of the mercury thread is 15 mm. When the thermometer is immersed in steam from distilled water the length of the thread is 190 mm.
- Termometer merkuri direndam kedalam air batu yang mencair dan didapati panjang merkuri 15mm. Apabila termometer berada dalam kawasan berwap air suling panjang merkuri menjadi 190 mm.*
- (i) What is the length of the mercury thread at  $0^{\circ}\text{C}$ ?  
*Berapakah panjang merkuri pada suhu  $0^{\circ}\text{C}$ ?*
- .....  
 [1 mark]
- (ii) What is the temperature when the length is 150 mm?  
*Hitungkan suhu merkuri apabila panjang merkuri 150 mm?*

[2 marks]

- 3 Figure 3.1 shows velocity-time graph for a car traveling along a straight road.  
*Rajah 3.1 menunjukkan graf halaju-masa bagi gerakan sebuah kereta di jalan raya*

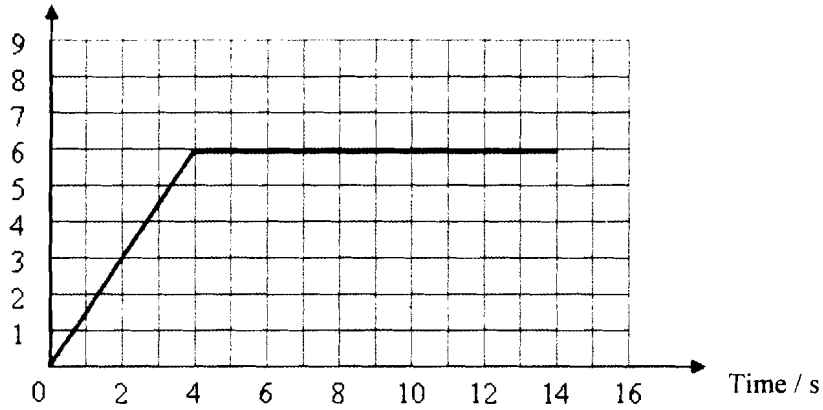


FIGURE 3.1

- (a) What is meant by velocity?  
*Apakah yang dimaksudkan dengan halaju ?*
- .....
- (b) Calculate the average speed of the car for the whole journey  
*Kirakan halaju purata kereta itu sepanjang perjalanannya .*

[1 mark]

[3 marks]

- (c) Sketch acceleration-time graph for the car during the first 10 s.  
*Lakarkan graf pecutan lawan masa kereta itu dalam tempoh 10 saat pertama.*

[3 marks]

- 4 Diagram 4.1 shows a boy launching a water rocket bottle using the bicycle pump at the field. The water in the bottle is ejected at a very high speed with backwards direction and the rocket bottle moves forward.

Rajah 4.1 menunjukkan seorang budak lelaki melancarkan satu roket botol airdengan menggunakan pam basikal di satu kawasan terbuka. Air dalam botol tersembur keluar dengan halaju tinggi ke arah belakang dan roket botol iut bergerak ke hadapan.

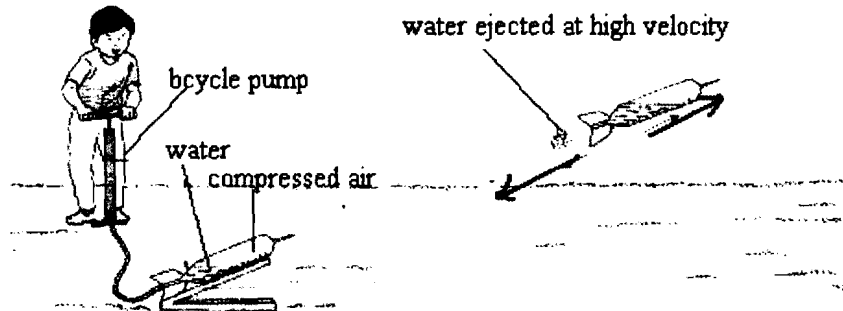


DIAGRAM 4.1

- (a) State the physics principle that is involved in the movement of the water bottle rocket.  
*Nyatakan satu prinsip fizik yang terlibat dalam pergerakan roket botol itu*

[1 mark]

- (b) Explain why the the water bottle rocket moves forward  
*Terangkan mengapa roket botol itu bergerak ke hadapan*

[1 mark]

- (c) The mass of the bottle rocket is 0.2 kg and the velocity of the water ejected is  $2 \text{ m s}^{-1}$ . If the mass of the water is 0.2 kg, calculate the velocity of the the rocket bottle.

*Jisim roket botol itu ialah 0.2 kg dan halaju air yang tersembur ialah  $2 \text{ ms}^{-1}$ . Jika jisim air itu ialah 0.2 kg, kirakan halaju roket botol itu*

[2 marks]



(d) Name **one** application of the physics principle stated in (a) in sports field.

*Namakan satu kegunaan prinsip fizik yang dinyatakan di (a) dalam bidang sukan.*

[ 1 mark ]

5 The Diagram 5.1 shows before and when air flow through tube.  
*Rajah 5.1 menunjukkan sebelum dan semasa udara mengalir dalam tiub.*

The Diagram 5.2 shows the situation of the roof of a house before and when high wind  
*Rajah 5.2 menunjukkan situasi bumbung rumah sebelum dan semasa udara laju bertiup.*

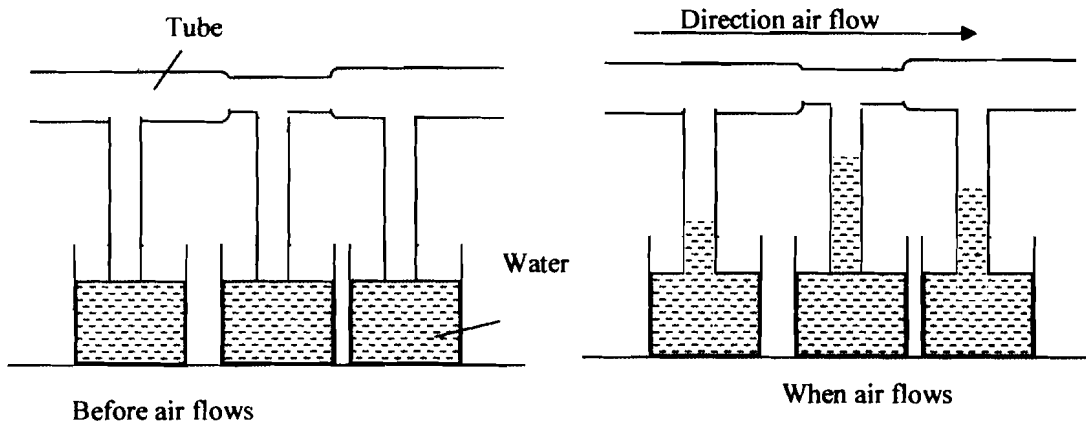


DIAGRAM 5.1

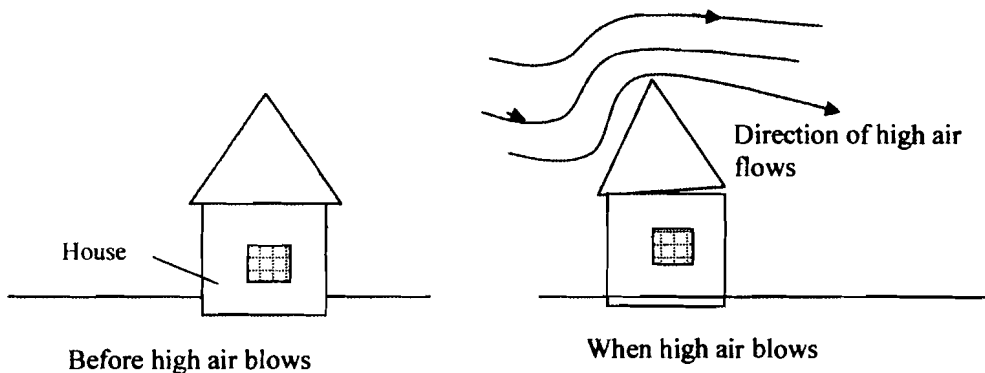


DIAGRAM 5.2

(a) What is meant by speed?  
*Apakah maksud laju?*

[ 1 mark ]

(b) Based on Diagram 5.1 and Diagram 5.2:  
*Berdasarkan Rajah 5.1 dan Rajah 5.2:*

(i) State **two** similarities for the situations in Diagram 5.1 and Diagram 5.2.  
*Nyatakan **dua** kesamaan bagi situasi Rajah 5.1 dan Rajah 5.2*

1. ....
2. ....

[2 marks]

(ii) Compare the air pressure above and below the roof when high air blown.  
*Bandingkan tekanan di atas dan di bawah bumbung semasa udara laju meniup ke atas bumbung itu.*

.....

[1 mark]

(iii) Relate the speed of the air and the pressure of the air.  
*Hubungkait laju udara dengan tekanan udara*

.....

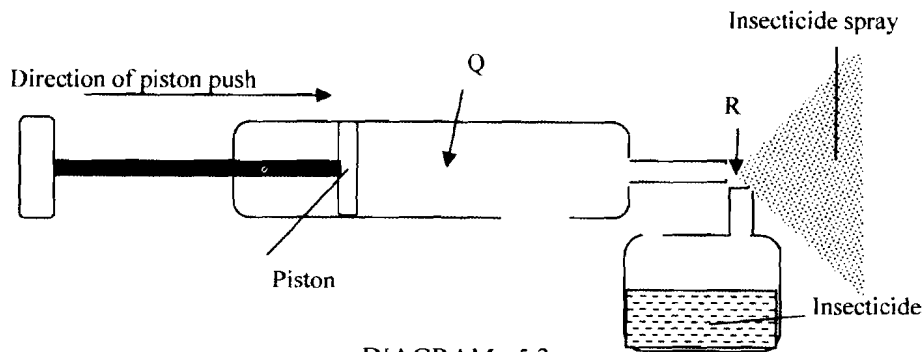
[1 mark]

(c) Name the principle involved in 5 (b)(iii).  
*Nama prinsip yang terlibat dalam 5 (b)(iii).*

.....

[1 mark]

(d) Diagram 5.3 shows an instrument use to spray an insecticide.  
*Rajah 5.3 menunjukkan suatu alat untuk menyembur pemusnah serangga.*



In Diagram 5.3,  
 Dalam Rajah 5.3,

- (i) Compare the speed of air at Q and at R.  
*Bandingkan kelajuan udara pada Q dan R.*

.....  
 [1 mark]

- (ii) Compare air the pressure at Q and R.  
*Bandingkan tekanan udara pada Q dan R..*

.....  
 [1 mark]

- 6 Diagram 6.1 shows the piston for bicycle pump is pushed in slowly until the volume of the cylinder decrease as shown in Diagram 6.2. The air in the pump remains at constant temperature.

*Rajah 6.1 menunjukkan piston pamabsikal ditolak dengan perlahan sehingga isipadu selinder itu mengurang seperti yang ditunjukkan dalam Rajah 6.2. Suhu udara dalam pam itu tidak berubah.*

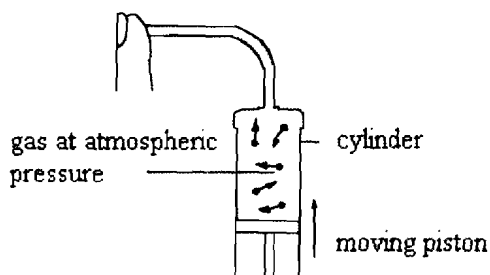


DIAGRAM 6.1

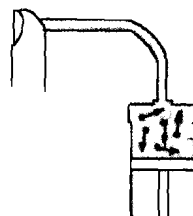


DIAGRAM 6.2

- (a) Using Diagram 6.1 and Diagram 6.2 state **two observations** about the volume of the gas and the collision of the gas molecules.

*Menggunakan Rajah 6.1 dan 6.2, nyatakan dua pemerhatian tentang isipadu gas dan perlanggaran molekul-molekul gas*

.....  
 .....

[2 marks]

- (b) Compare the pressure of gas in Diagram 6.1 and 6.2.

*Bandingkan tekanan gas dalam Rajah 6.1 dan 6.2*

.....

[1 mark]

- (c) State the relationship between the gas pressure and the volume of the gas

*Nyatakan perhubungan antara tekanan gas dan isipadu gas itu*

.....

[1 mark]

- (d) Based on your answer in (c), name the gas law involved

*Berdasarkan jawapan anda dalam (c), namakan hukum gas yang terlibat.*

.....

[1 mark]

- (e) A balloon contains  $6 \text{ m}^3$  of helium at pressure of  $100 \text{ kPa}$ . As the balloon rises through the atmosphere, the pressure falls and the balloon expands. Assuming that the temperature does not change, what is the volume of the balloon when the pressure has fallen to  $40 \text{ kPa}$ .

*Satu belon diisi dengan  $6 \text{ m}^3$  gas helium pada tekanan  $100 \text{ kPa}$ . Semasa belon itu naik ke atas dirauangan udara, tekanan udara berkurang dan menyebabkan belon itu mengembang. Jika suhu tidak berubah, berapakah isipadu belon itu bila tekanann turun kepada  $400 \text{ kPa}$*

[2 marks]

- 7 Diagram 7.1 shows a manometer used to measures *pressure of gas* in the closed container.

*Rajah 7.1 menunjukkan satu manometer yang digunakan untuk mengukur tekanan gas dalam satu bekas tertutup*

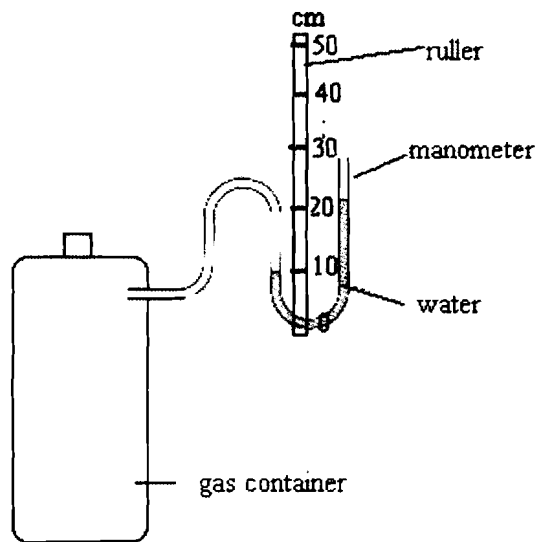


DIAGRAM 7.1

- (a) What is meant by *pressure of gas*?  
*Apakah yang dimaksudkan tekanan gas?*

.....

[1 mark]

- (b) What is the function of the ruler?  
*Apakah kegunaan pembaris itu ?*

.....  
[1 mark]

- (c) Explain how the gas pressure in the container measured?  
*Terangkan bagaimana tekanan gas dalam bekas itu diukur ?*

.....  
[2 marks]

- (d) Based on the Diagram 7.1 ,  
*Berdasarkan Rajah 7.1,*

- (i) determine the gas pressure in the container  
*Tentukan tekanan gas dalam bekas itu*  
[atmospheric pressure is 10 m water]

[2 marks]

- (ii) What is the pressure of the gas in Pa  
*Berapakah tekanan gas itu dalam Pa*  
[atmospheric pressure  $1 \times 10^5$  Pa and density of water  $1 \times 10^3$  kgcm<sup>-3</sup>]

[2 marks]

- (e) State two changes that would allow the manometer to measured the higher pressure of gas.

*Nyatakan dua perubahan yang dilakukan untuk membolehkan manometer itu mengukur tekanan gas yang lebih tinggi*

.....  
[2 marks]

- 8 Diagram 8.1 shows a hanging mirror with a weight of 20.0 N hanging freely by a string PQR of a length of 50 cm.

Rajah 8.1 menunjukkan sebuah gambar dengan beban 20.0 N tergantung bebas pada tali PQR sepanjang 50 cm.

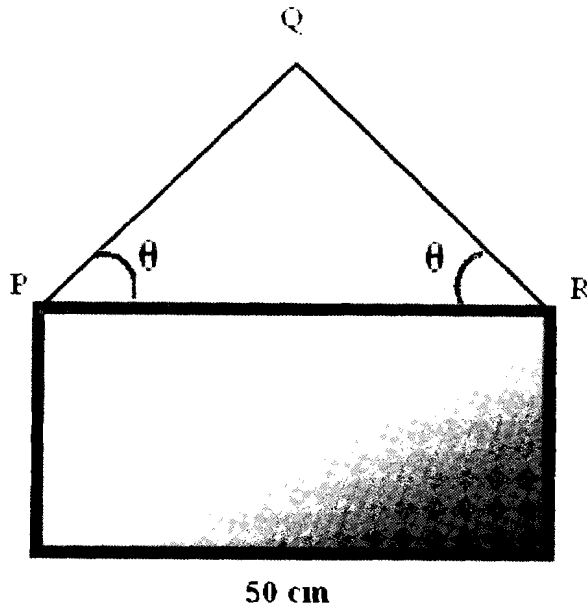


DIAGRAM 8.1

- (a) (i) What is meant by resultant force?  
*Apakah maksud daya paduan?*

.....

[1 mark]

- (ii) State a condition where forces are in equilibrium.  
*Nyatakan keadaan di mana daya-daya adalah dalam keseimbangan.*

.....

[1 mark]

- (b) (i) Based on Diagram 8.1, find the value of angle  $\theta$ .  
*Berdasarkan Rajah 8.1, cari nilai sudut  $\theta$ .*

- (ii) The picture in diagram 8.1 is in equilibrium. What is the tension of the string?  
*Gambar pada Rajah 8.1 adalah dalam keseimbangan. Berapakah ketegangan pada benang?*

[3 marks]

- (c) Diagram 8.2, 8.3 and 8.4 shows three ways of hanging the mirror.  
*Rajah 8.2, 8.3 dan 8.4 menunjukkan tiga cara menggantung cermin.*

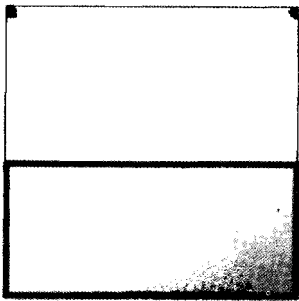


DIAGRAM 8.2

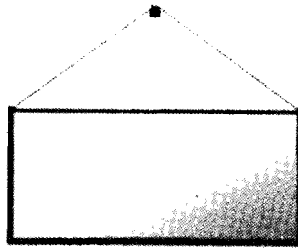


DIAGRAM 8.3

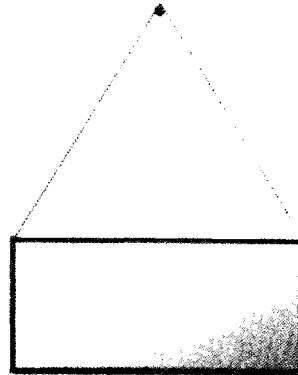


DIAGRAM 8.4

- (i) In which diagram, the tension of the string is maximum? Explain why.  
*Dalam Rajah yang manakah ketegangan benang adalah maksimum? Terangkan mengapa?*

.....  
 .....

[2 marks]

- (ii) In which diagram, the tension of the string is minimum? Explain  
*Dalam Rajah yang manakah ketegangan benang adalah minimum? Terangkan ?*

.....  
 .....

[2 marks]

- (iii) Which of the diagram do you think is suitable to hang a heavy picture? Explain.  
*Yang manakah cara yang paling sesuai untuk menggantung gambar yang berat. Terangkan*

[2 marks]

**Section B***Answer any one question.*

- 9 Diagram 9.1 and Diagram 9.2 shows a comparison of two springs, M and N. Both the springs are elasticity made from the same wire and material. They are attached to load of equal weight.

*Rajah 9.1 dan Rajah 9.2 menunjukkan perbandingan dua spring M dan N. Kedua-duanya mempunyai keelastikan dan dibuat daripada wayar dan bahan yang sama. Kedua-dua spring kemudiannya diletakkan beban yang sama berat.*

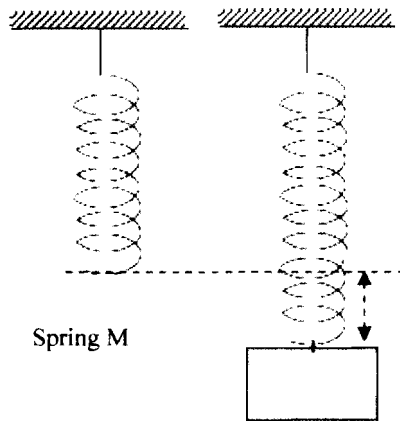


DIAGRAM 9.1

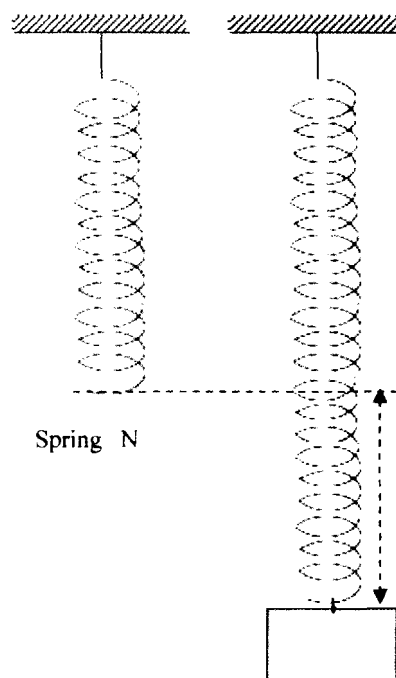


DIAGRAM 9.2

- (a) What is meant by elasticity of a material ?  
*Apakah yang dimaksudkan dengan keelastikan suatu bahan.* [ 1 mark]
- (b) Based on Diagram 9.1 and Diagram 9.2  
*Berdasarkan Rajah 9.1 dan Rajah 9.2*
- (i) Compare the forces applied on the springs and the extension of the springs.  
*Bandingkan daya yang digunakan ke atas spring dan pemanjangan spring.* [ 3 marks]
- (ii) Compare the spring constant M and N , hence relate the spring constant and the natural length of the spring.  
*Bandingkan pemalar spring M dan N, seterusnya hubungkan pemalar dengan panjang asal spring.*

[ 2 marks]



- (c) A spring produces an extension of 4 cm when a stretching force of 1.2 N is applied to it.  
What is the spring constant of the spring?  
*Satu spring menghasilkan pemanjangan sebanyak 4 cm apabila satu daya regangan 1.2 N dikenakan. Berapakah pemalar spring bagi spring tersebut?*
- (d) Explain how the forces between the molecules caused the elasticity.  
*Terangkan bagaimana daya-daya antara molekul-molekul menyebabkan keelastikan.*
- [ 4 marks]
- (e) Diagram 9.3 shows a spring of suspension system of an ordinary motorcycle.  
*Rajah 9.3 menunjukkan spring pada sistem suspensi motorsikal biasa.*

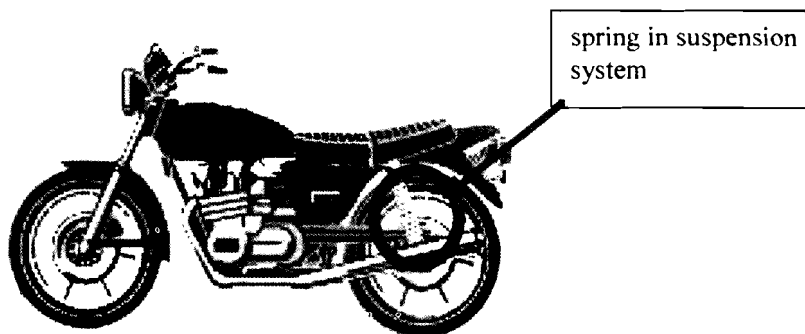
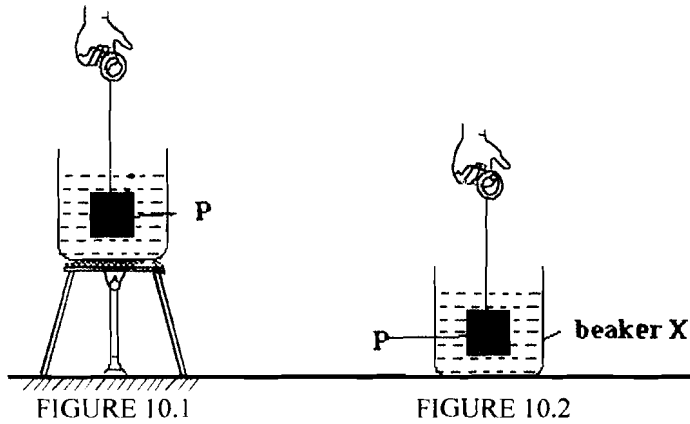
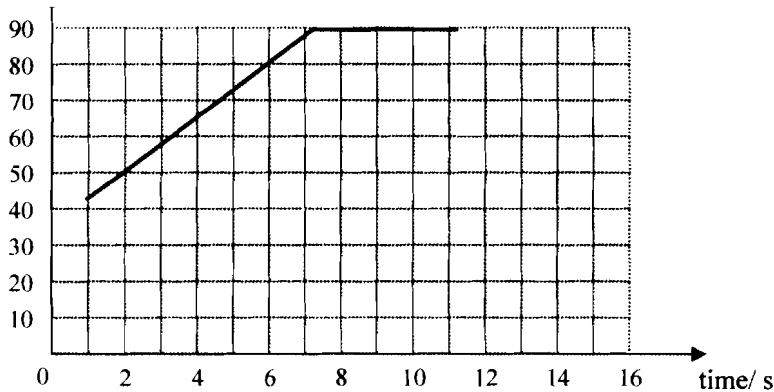


DIAGRAM 9.3

- (i) What are the functions of the spring in the suspension system?  
*Apakah fungsi-fungsi spring di dalam sistem suspensi.*
- [2 marks]
- (ii) Explain the modification that needs to be done on the spring to enable it to be a racing motorcycle.  
You should explain your suggestions, to include the following aspects :  
- the characteristics of the spring material  
- the designs of the spring  
*Terangkan pengubahsuaian yang perlu dilakukan ke atas spring untuk membolehkan ia digunakan untuk motorsikal lumba.  
Anda perlu menerangkan cadangan anda, merangkumi aspek-aspek berikut:*  
- ciri-ciri bahan untuk membina spring  
- rekabentuk spring
- [ 6 marks]
- 10 Figure 10.1 shows block P immersed in boiling water for long time. Then the block immersed in the water in the beaker X as shown in Figure 10.2.  
Graph 10.3 shows the changing of the temperature of water in beaker X.
- Rajah 10.1 menunjukkan blok P direndamkan di dalam air yang sedang mendidih untuk jangka masa yang lama. Kemudian blok itu direndamkan di dalam air dalam bikar X seperti yang ditunjukkan dalam Rajah 10.2.  
Graf 10.3 menunjukkan perubahan suhu air dalam bikar X itu*

Temperature/ $^{\circ}\text{C}$ 

GRAPH 10.3

- (a) What is meant by temperature?

*Apakah yang dimaksudkan dengan suhu?*

[1 mark]

- (b) Using graph 10.3,

*Menggunakan Graf 10.3*

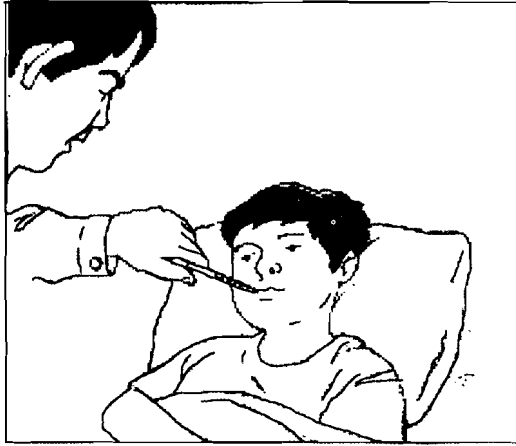
- (i) explain the changing water temperature in beaker X.  
*Terangkan perubahan suhu air dalam bikar X itu*
- (ii) State the Relationship between the change of the temperature and heat transfer for the last 4 minutes to deduce the relevant physics concept and the of name of the concept..

*Nyatakan hubungan antara perubahan suhu dengan pemindahan haba bagi 4 minit terakhir untuk mendapatkan satu konsep fizik dan namakan konsep tersebut*

[5 marks]

- (c) Figure 10.4 shows a doctor taking the temperature of a hospital patient

*Rajah 10.4 menunjukkan seorang doktor sedang mengambil suhu seorang pesakit di hospital*



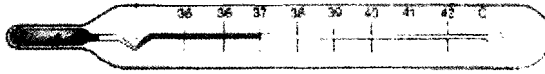
**FIGURE 10.4**

Explain why the doctor left a thermometer under the patient's tongue for few minutes before reading the thermometer.

*Terangkan mengapa doctor itu meletakkan termometer di bawah lidah pesakit dalam masa beberapa minit sebelum mengambil bacaan*

[4 marks]

- (d) Figure 10.5 is a thermometer used by doctor at a hospital.  
*Figure 10.5 is a thermometer used by doctor at a hospital.*



**FIGURE 10.5**

Explain how you would design the thermometer that can measure the temperature of a patient of a hospital. In your explanation, emphasize the following aspects:

*Explain how you would design the thermometer that can measure the temperature of a patient of a hospital. In your explanation, emphasize the following aspects:*

- (i) the liquid used for the thermometer  
*Cecair yang digunakan dalam termometer itu.*
- (ii) the sensitivity of the thermometer  
*Kepekaan termometer itu.*
- (iii) the calibration of the thermometer  
*Kaedah penentukuran*

[10 marks]

**Section C**  
[ 20 marks ]

*Answer any one question.*

- 11 Diagram 11.1 shows a gas balloon, moored with a load at the Book Festival. The mass of the balloon is 5 kg. The balloon and the load float at a certain height and the buoyant force acting on the balloon is 250 N

*Rajah 11.1 menunjukkan satu belon gas ,yang diikat dengan satu beban di satu pesta buku. Jisim belon itu ialah 5 kg. Belon dan beban itu terapung pada ketinggian tertentu dan tujah ke atas yang bertindak pada belon itu ialah 250 N*

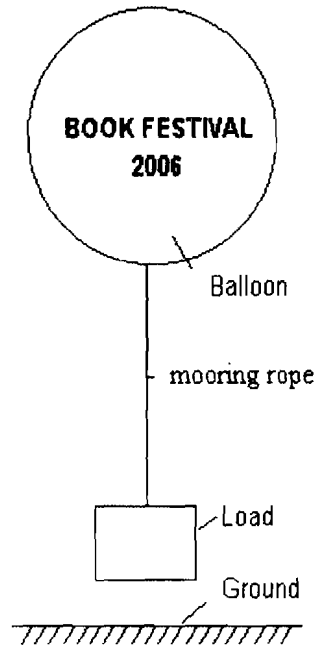


DIAGRAM 11.1

- (a) (i) What is the meaning of buoyant force?  
*Apakah yang dimaksudkan tujah ke atas?* [1 mark]
- (ii) Explain why the balloon and the load float?  
*Terangkan mengapa belon dan beban itu terapung?* [4 marks]
- (b) Table 11.2 shows the characteristics of four sets, A, B, C and D of balloons, ropes and loads.  
*Jadual 11.2 menunjukkan ciri-ciri bagi empat set A, B, C dan D bagi belon, tali dan beban.*

Set	Type of gas filled and density	Mass of loads/kg	Maximum Tension allowed / N
A	Helium ( $0.17 \text{ kg m}^{-3}$ )	5	300
B	Hydrogen ( $0.09 \text{ kg/m}^3$ )	20	250
C	Helium ( $0.17 \text{ kg m}^{-3}$ )	20	300
D	Nitrogen ( $1.25 \text{ kg/m}^3$ )	5	100

As a supervisor, you are assigned to investigate the characteristics of set balloons, ropes and loads that could be used for the purpose.

*Sebagai seorang penyelia anda ditugaskan untuk mengkaji ciri-ciri set belon, tali dan beban yang boleh digunakan bagi tujuan tersebut.*

Base on the table 11.2;  
Berdasarkan jadual 11.2

- (i) Explain the suitable characteristics of the balloons, ropes and loads so that it can be used  
*Terangkan kesesuaian ciri bagi belon, tali dan beban yang boleh digunakan*
- (ii) Decide which set is most suitable to be used at the festival.  
*Nyatakan set yang paling sesuai digunakan dipentas tersebut dan nyatakan sebabnya*
- (iii) Explain why the others set is not suitable  
*Terangkan mengapa set yang lain tidak sesuai.*

[10 marks]

- (c) If the mooring rope cut off, the balloons will rise up.  
*Jika tali pengikat itu putus, belon itu akan naik ke atas. Kirakan*

- (i) Calculate the resultant force of the balloon  
*Kirakan daya paduan bagi belon itu*
- (ii) Calculate the initial acceleration of the balloon  
*Kirakan Pecutan awal belon itu]*
- (iii) what is your assumption in your calculation in c(ii)  
*Apakah andaian and dalam pengiraan di (c)(ii)*

[5 marks]

- 12 As a quality control officer at a gas supplier factory, you are assigned to investigate the characteristics of manometer that could be used to measure the pressure of oxygen in the gas tank..

*Sebagai seorang pegawai kawalan mutu di sebuah kilang pengeluaran gas oksigen, anda ditugaskan untuk menyiasat ciri-ciri manometer yang boleh digunakan untuk mengukur tekanan gas oksigen dalam balang bekas tertutup.*

- (a) What is meant by pressure?  
*Apakah yang dimaksudkan tekanan ?*
- [1 mark]
- (b) Suggest briefly arrangement the manometer and gas tank to measure the pressure the gas. Draw a diagram to show how the manometer measures the pressure of the gas?

*Cadangkan secara ringkas satu susunan radas untuk menunjukkan bagaimana manometer digunakan untuk mengukur tekanan gas dalam satu bekas tertutup. Lukiskan rajah untuk menunjukkan bagaimana bacaan pada manometer diambil untuk mengukur tekanan gas dalam balang itu.*

[4 marks]

- (c) The table 12.1 shows the characteristics of four manometers.  
*Jadual 12.1 menunjukkan ciri-ciri empat manometer P, Q, R dan S.*

Manometer	Liquid used	Diameter of manometer	Glass-bore stem	Length/m
P	Mercury	Big	thick	0.5
Q	Mercury	Small	thick	0.8
R	Alcohol	small	thick	2.5
S	alcohol	big	thin	0.6

TABLE 12.1

Base on the table 12.1;

*Berdasarkan Jadual 12.1 ;*

- (i) Explain the suitable characteristics of the manometer so that it can be used to measure pressure oxygen in the gas tank.  
*Terangkan kesesuaian ciri manometer yang boleh digunakan untuk mengukur tekanan gas memasak dalam bekas tertutup.*
- (ii) Decide which manometer is most suitable to be used at the factory.]  
*Tentukan manometer yang paling sesuai digunakan di kilang tersebut.*
- [10 marks]
- (d) 5V of a gas at 30° C have pressure of 76 cm Hg. This gas is heated to 100 °C .  
*5V gas pada suhu 30° C mempunyai tekanan 76 cm Hg. Kemudian gas ini dipanaskan sehingga 100°C.*
- (i) What will be the new pressure of gas  
*Nyatakan tekanan gas yang baru*
- (ii) State the answer in(d)(i) in Pa  
*Nyatakan jawapan dalam (d)(i) dalam Pa.*

[5 marks]

**KERTAS SOALAN TAMAT**