Jawapan

Bab 2

BAB 2

Tekanan
Pressure

2.1 Tekanan Cecair
Pressure in Liquids

1. (a) besar, dalam / *greater, deeper*
(b) sama, sama / *same, same*

2. (a) beratnya / *weight*
(b) Ah, ρAh, ρAhg
(c) $\frac{\rho Ahg}{A} = h\rho g$

P = Tekanan cecair
Pressure of a liquid
h = Kedalaman
The depth
ρ = Ketumpatan cecair
Density of the liquid
g = Pecutan graviti
Gravitational acceleration

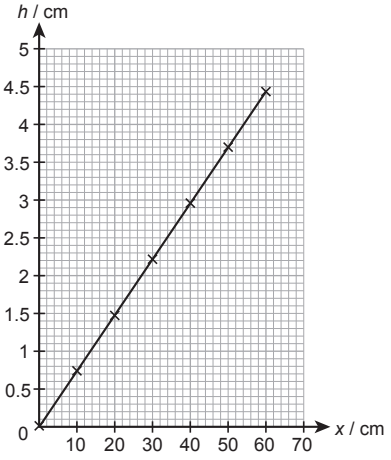
3. (a) Air memancut keluar dengan paling jauh dari lubang Z manakala jarak terpendek direkodkan untuk air yang memancut keluar dari lubang X.
The water gushing out of the hole farthest from Z and recorded the shortest distance to the water gushing out of the hole X.
(b) rendah, jauh / *lower, greater*

4. **Inferens / *Inference*:**
kedalaman, *depth*
Hipotesis / *Hypothesis*:
meningkat / *increase*
Pemboleh ubah / *Variables*:
(a) Kedalaman cecair / *Depth of liquid*
(b) Tekanan dalam cecair / *Pressure in liquid*
(c) Jenis cecair / *Type of liquid*

Keputusan / *Results*:

x / cm	h / cm
10	0.74
20	1.47
30	2.21
40	2.94
50	3.68
60	4.41

Analisa Data / *Analysis of Data*:



Kesimpulan / *Conclusion*:
bertambah / *increases*

5. (a) berbeza / *different*
(b) cepat, perlahan / faster, slower
(c) Ketumpatan air adalah lebih tinggi daripada minyak. Oleh itu, semakin tinggi ketumpatan cecair, semakin tinggi tekanan dalam cecair pada titik yang sama dan kedalaman yang sama.
The density of water is higher than that of oil. Therefore, the higher the density of the liquid, the higher the pressure in the liquid at the same point and the same depth.

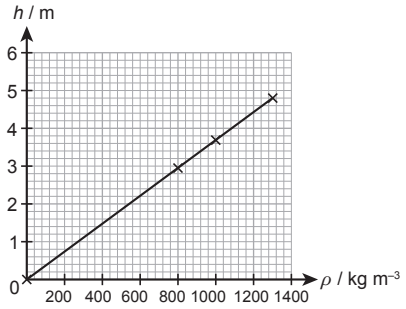
6. **Hipotesis / *Hypothsis*:**
tinggi / *higher*

Pemboleh ubah / *Variables*:
(a) Ketumpatan cecair / *Density of liquid*
(b) Tekanan cecair / *Pressure in liquid*
(c) Kedalaman cecair / *Depth of liquid*

Keputusan / *Results*:

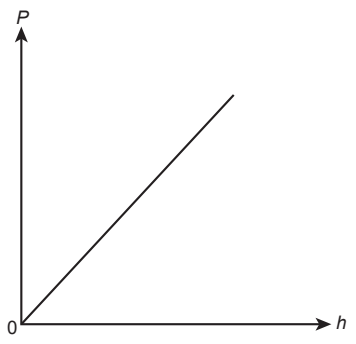
ρ / kg m^{-3}	h / cm
800	2.94
1 000	3.68
1 300	4.78

Analisa data / *Analysis of data*:



Kesimpulan / *Conclusion*:
meningkat / *increases*

7. (a) Kedalaman cecair
Depth of liquid
= 25 – 5 = 20 cm = 0.2 m
Tekanan / *Pressure* , $P = h\rho g$
= 0.2 × (1 300) × 10 = 2 600 Pa
(b) Tekanan / *Pressure*, $P = h\rho g$
= 15 × (1 040) × 10 = 156 000 Pa
(c)



(d) A = Minyak / *Oil*
B = Air / *Water*
$h_A \rho_A g = h_B \rho_B g$
$h_A \rho_A = h_B \rho_B$
$8(\rho_B) = (6)(1)$
$\rho_A = 0.75$ g cm^{-3}

8. (a) tinggi, tinggi / *high, high*
(b) lebih tinggi, tekanan / *higher, pressure*
(c) hidroelektrik, bekalan air, lebih nipis, lebih tebal, tinggi
hydroelectric, water supply, thinner, thicker, high

9. (a) Kedalaman air / *Depth of water*
(b) $P = h\rho g$
$P = 2(1000)(10) = 20\,000$ Pa
(c) Kedalaman Y lebih tinggi daripada kedalaman X. Tekanan air di Y lebih tinggi daripada tekanan air di X.
The depth at Y is higher than the depth at X. The water pressure at Y is higher than the water pressure at X.

2.2 Tekanan Atmosfera
Atmospheric Pressure

1. Tekanan yang disebabkan oleh berat lapisan udara di atmosfera yang bertindak ke atas permukaan Bumi.
The pressure caused by the weight of the layer of air in the atmosphere acts on the Earth's surface.

2.

• kemek / *dented* • tinggi, semua arah / *high, all directions*	• kekal / *remains* • menolak / *pushes*

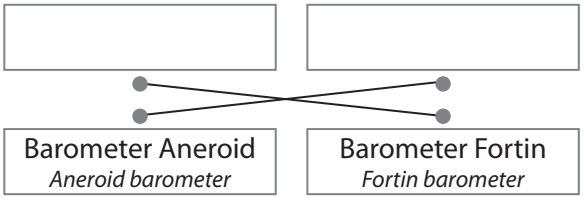
3. (a) Nilai tekanan atmosfera boleh ditentukan menggunakan barometer merkuri. Sebuah barometer merkuri terdiri daripada sebatang tiub kaca kira-kira 1 meter panjang yang mengandungi merkuri.
The value of atmospheric pressure can be measured by using a mercury barometer. A mercury barometer consists of a 1 metre long glass tube containing mercury.
(b) Pada aras laut, tekanan atmosfera boleh menyokong sebuah turus merkuri sehingga ketinggian 76 cm. Pada altitud yang lebih tinggi, ketinggian turus merkuri adalah lebih rendah daripada 76 cm.
At sea level, atmospheric pressure can support a mercury column to a height of 76 cm. At higher altitudes, the height of mercury column is lower than 76 cm.
(c) $P_{atm} = h\rho g$
h = ketinggian turus merkuri

the height of mercury column

ρ = ketumpatan merkuri
the density of mercury

g = pecutan graviti
the acceleration due to gravity

4.



5. (a) Betul / *True*
(b) Betul / *True*
(c) Salah / *False*

6. (a) (i) $P = 106 - 30$
$= 76$ cm Hg
(ii) $P = h\rho g$
$= 0.76 \times 1.36 \times 10^4 \times 10$
$= 103360$ Pa
(iii) $P_A = 76$ cm Hg
(iv) $P_B = 106$ cm Hg
$P_B = h\rho g$
$= 1.06 \times 1.36 \times 10^4 \times 10$
$= 144{,}160$ Pa

(b) (i) $P_{atm} + 4 = 78$
$P_{atm} = 78 - 4 = 74$ cm Hg
$P_{atm} = h\rho g$
$= 0.74 \times 1.36 \times 10^4 \times 10$
$= 100\,640$ Pa
(ii) $P_{atm} = 76$ cm Hg
$P_{atm} = h\rho g$
$= 0.76 \times 1.36 \times 10^4 \times 10$
$= 103360$ Pa
(iii) $73 + 4 = P_{atm}$
$P_{atm} = 77$ cm Hg
$P_{atm} = h\rho g$
$= 0.77 \times 1.36 \times 10^4 \times 10$
$= 104720$ Pa

7. (a) bertambah, rendah, rendah
increases, lower, lower
(b) tinggi, berat / *high, heavy*
(c) • lebih cepat / *faster*
• kekurangan / *Decreased*
• jelas / *clearly*
• makan, dehidrasi / *appetite, dehydrated*
• meningkat / *increases*

8. • Peningkatan / *Increased*
• melarut / *dissolves*
• tinggi / *High*
• nitrogen, sakit dada, kematian
nitrogen, chest pain, death

2.3 Tekanan Gas
Gas Pressure

1. daya yang dikenakan pada dinding suatu bekas oleh zarah gas per unit luas dinding itu.
force exerted on the wall of a container by gas particles per unit area of the wall.

2. (a) ✓ (b) ✗ (c) ✓ (d) ✓ (e) ✓

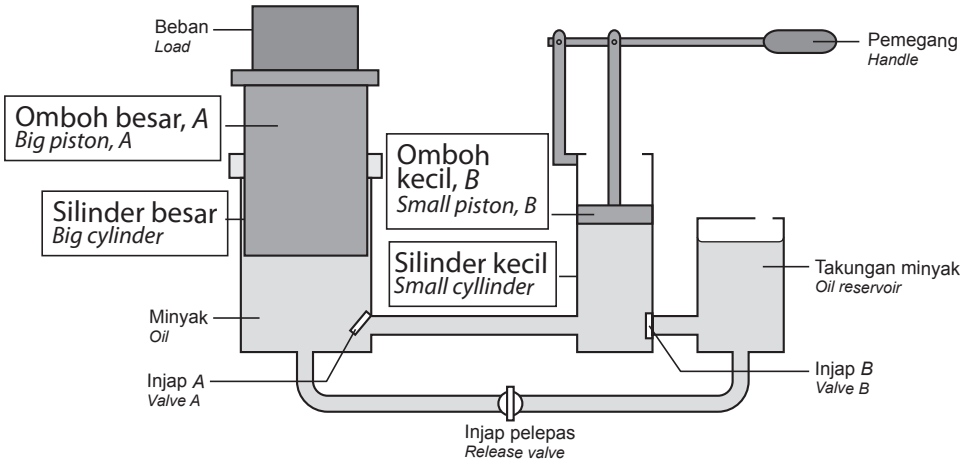
3. (a) $P_{gas} = P_{atm} + h\rho g$
$= 103360 + 0.14(13600)10$
$= 103360 + 19\,040$
$= 122\,400$ Pa
(b) (i) $P_{Hg} = 39 - 15 = 24$ cm Hg
$P_{gas} = P_{atm} + P_{Hg}$
$= 76 + 24$
$= 100$ cm Hg
(ii) $P_{gas} = h\rho g = 1(13600)(10)$
$= 136\,000$ Pa

2.4 Prinsip Pascal
Pascal's Principle

1. (a) semua arah
all directions
(b) dipindahkan secara seragam ke semua arah dalam bendalir itu
the pressure applied on an enclosed fluid is transmitted uniformly in all directions in the fluid

2. (a) pengganda daya
force multiplier
(b) kecil, besar
small, large
(c) sama
equal
(d) $\frac{F_2}{A_2}$ (e) $F_2 = F_1 \times \frac{A_2}{A_1}$
$F_2 = 100 \times 10 = 1000$ N

3.



4.

(a) Ketika pemegang dinaikkan, omboh kecil, *A* dinaikkan, injap *A* masih tertutup tetapi injap B dibuka.
When the handle is raised, the small piston, A is raised, valve A is still closed *but valve B is* open.

(b) Tekanan atmosfera menolak minyak dari takungan minyak untuk mengalir dari takungan minyak ke silinder kecil.
Atmospheric pressure pushes oil from the oil reservoir *to flow from the oil reservoir into a small cylinder.*

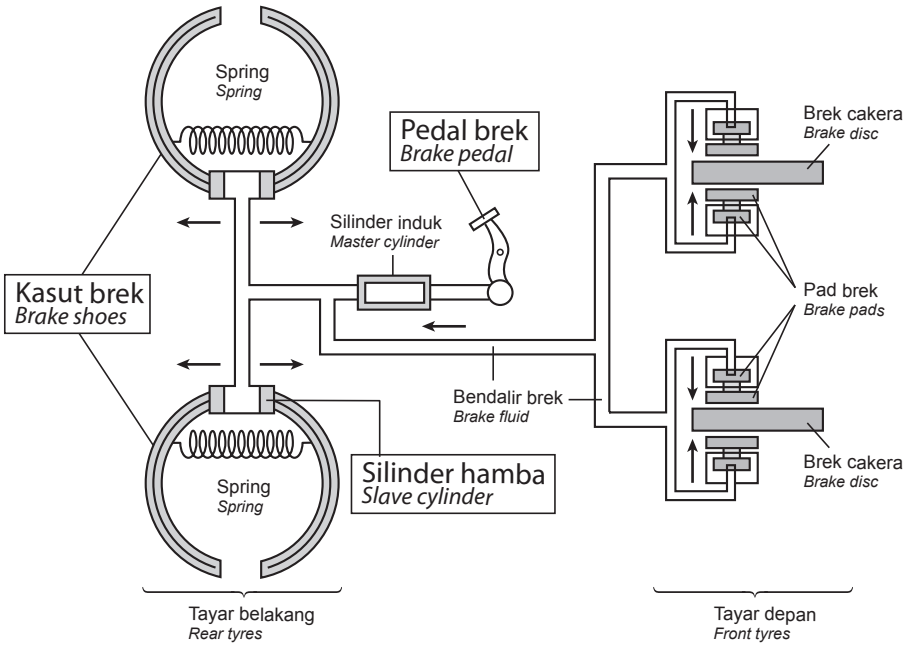
(c) Ketika pemegang ditolak ke bawah, omboh kecil *B* digerakkan ke bawah, injap *A* terbuka tetapi injap B adalah tertutup sekarang.
When the handle is pushed down, the piston small B is moved down, valve A is open *but valve B is* closed *now.*

(d) Tekanan yang dikenakan akan disebarkan secara seragam dari omboh kecil *B* ke omboh besar *A* melalui minyak.
The applied pressure will be uniformly *distributed from small piston B to large piston A through the oil.*

(e) Daya yang besar kemudian bertindak pada omboh besar *A* yang menaikkan beban berat.
A large *force then acts on a large piston A which raises a heavy load.*

(f) Dengan mengulangi langkah-langkah ini, beban yang berat dapat diangkat ke kedudukan yang lebih tinggi. Selepas habis kerja pembaikan kereta, injap pelepas dibuka untuk menurunkan objek ke kedudukan asal.
By repeating these steps, a heavy load can be lifted to a higher position. After completion of the car repair work, the release valve *is opened to lower the object to its original position.*

5.



6.

(a) Apabila pedal brek ditekan, tekanan dikenakan pada omboh di dalam silinder induk.
When the brake pedal is pressed, pressure is applied to the piston inside the master cylinder.

(b) Tekanan ini kemudian dihantar sama rata melalui bendalir brek ke silinder hamba untuk roda depan dan roda belakang.
This pressure is then transmitted evenly through the brake fluid to the slave cylinders for the front and rear wheels.

(c) Silinder hamba kemudian ditolak ke depan, menyebabkannya menolak pad brek dan kasut brek ke brek cakera dan brek gelendong masing-masing.
The slave cylinder is then pushed forward, causing it to push the brake pads and brake shoes onto the disc brakes and spindle brakes, respectively.

(d) Pergerakan kereta ini lambat kerana geseran antara pad brek (atau kasut brek) dengan brek cakera (atau brek gelendong).
The movement of this car then slowed down due to friction between the pads brakes (or brake shoes) with brakes disc (or spindle brake).

(e) Apabila pedal brek dilepaskan, omboh dalam silinder induk ditolak kembali ke kedudukan asalnya oleh spring.
When the brake pedal is released, the piston in the master cylinder is pushed back to its original position by the spring.

(f) Pad geseran di roda depan dan roda belakang kembali ke kedudukan asalnya oleh tindakan spring.
Sliding pads on the front wheels and back wheels are returned to their original position by spring action

7. (a) (i) $P = \frac{F_1}{A_2} = \frac{50}{0.05} = 1\,000$ Pa

(ii) $P_A = P_B$

$P_A = \frac{F_B}{A_B}$

$1000 = \frac{F_B}{1.5}$

$F_B = 1500$ N

(iii) Pergerakan isi padu pada omboh *A* = Pergerakan isi padu pada omboh *B*
Volume movement on piston A = Volume movement on piston B
$V_A = V_B$
$(0.05)(1) = (1.5)\,h$
$h = 0.033$ m $= 3.3$ cm

(iv) $P_1 = P_2$

$\frac{F_1}{A_1} = \frac{F_2}{A_2}$

$\frac{F_1}{0.05} = \frac{2\,500}{1.5}$

$F_A = 83.3$ N

(b) (i) Tekanan A = Tekanan B (Prinsip Pascal)

$P = \frac{F}{A}$

$30\ cm^2 = 30 \times 10^{-4}\ m^2 = 3 \times 10^{-3} = 0.003\ m^2$

$P = \frac{F}{A} = \frac{150}{0.003} = 50\,000$ Pa

(ii) $P_1 = P_2$

$50000 = \frac{F_2}{A_2}$

$F_2 = 50000 \times 1.2 = 60\,000$ N

(iii) Daya pada omboh *B* akan berkurang.
The force on piston B will decrease.

2.5 Prinsip Archimedes
Archimedes' Principle

1. (a) daya apungan yang bertindak pada kapal tersebut
buoyant force acting on the ship

(b) daya yang bertindak ke atas apabila terdapat perbezaan tekanan antara permukaan atas dengan permukaaan bawah suatu objek yang terendam di dalam suatu cecair.
the force acting upwards on an object immersed in a liquid when there is pressure difference between the lower surface and upper surface of the object.

(c) daya apungan yang sama dengan berat bendalir yang disesarkan.
buoyant force equal to the weight of fluid displaced.

(d)

Daya apungan = Berat sebenar – Berat ketara
Buoyant force = *Actual weight — Apparent weight*
= 7 N – 4 N
= 3 N

2. Pemboleh ubah / *Variables*:

(a) Berat air yang disesarkan
Weight of water displaced

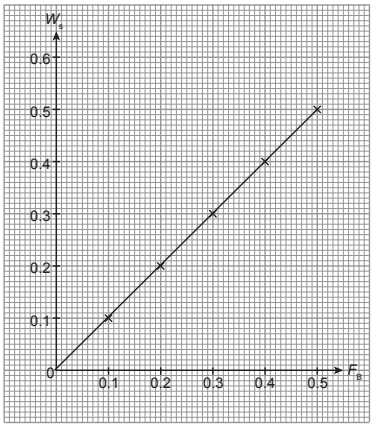
(b) Daya apungan / *Buoyant force*

(c) Ketumpatan air / *Density of water*

Keputusan / *Results*:

Berat di udara / N (W_A) ***Weight in the air / N (W_A)***	**Berat dalam air / N (W_B)** ***Weight in water / N (W_B)***	**Berat air disesarkan / N (W_S)** ***Weight of water displaced /N (W_S)***	**Daya apungan / N** ***Buoyant force / N ($F_B = W_A - W_B$)***
1	0.9	0.1	0.1
2	1.8	0.2	0.2
3	2.7	0.3	0.3
4	3.6	0.4	0.4
5	4.5	0.5	0.5

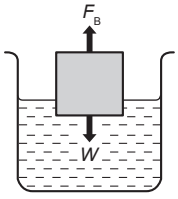
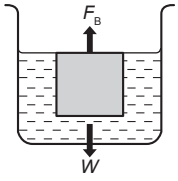
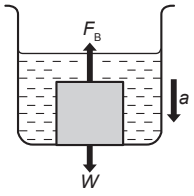
Analisis data / *Data analysis*:



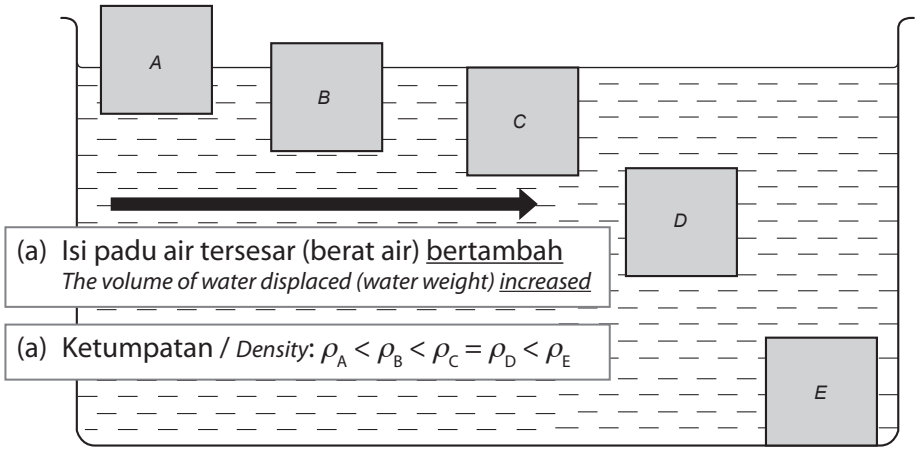
Kesimpulan / *Conclusion*:

sama / *equal*

3.

Objek terendam separa dalam cecair ***The object is partially immersed in a liquid***	**Objek terendam sepenuh dalam cecair** ***The object is completely immersed in the liquid***	**Objek tenggelam ke dalam cecair** ***The object sinks into the liquid***
		
Berat objek = Daya apungan *Object weight = Buoyant force*	Berat objek = Daya apungan *Object weight = Buoyant force*	Berat objek > Daya apungan *Object weight > Buoyant force*
Isi padu objek > Isi padu air tersesar *Volume of the object > Volume of water displaced*	Isi padu objek = Isi padu air tersesar *Volume of the object = Volume of water displaced*	Isi padu objek = Isi padu air tersesar *Volume of the object = Volume of water displaced*
Ketumpatan cecair > Ketumpatan objek *Liquid density > Object density*	Ketumpatan cecair = Ketumpatan objek *Liquid density = Object density*	Ketumpatan cecair < Ketumpatan objek *Liquid density < Object density*

4. (a)



5. (a) (i) tangki balast / *ballast tank*
(ii) memasukinya, meningkat, lebih besar / *enter it, increased, increase*
(iii) keluar / *out*
(iv) menurun, menurun
decrease, decrease
(b) (i) rendah / *lower*
(ii) lebih besar / *greater*
(c) (i) sama / *equal*
(ii) berongga, kurang, daya apungan
hollow, less, buoyant force
(iii) kedalaman, had selamat
depths, safe limits
(d) (i) ketumpatan / *density of liquids, density of liquids*
(ii) pegun / *stationary*
(iii) naik ke atas, tenggelam lebih ke bawah / *upwards, sink further down*

6. (a) (i) Berat air disesarkan = Daya apungan
Weight of water displaced = Buoyant force
= 5-3.5 = 1.5 N
(ii) Daya apungan / *Buoyant force* = ρVg
1.5 = 1000(V)10
$V = 0.00015\ m^3 = 150\ cm^3$
(b) (i) Jumlah berat belon = Berat belon + berat helium
Total weight of balloon = Weight of balloon + weight of helium
Berat helium / *Helium weight*
= ρVg = 0.5(8)(10) = 40 N
Jumlah berat belon
Total weight of balloon
= 40 + 50 = 90 N
(ii) Berat udara / *Air weight*
= ρVg = 1.5(8)(10) =120 N
(iii) Belon itu akan naik ke atas kerana daya apungan adalah lebih besar daripada jumlah berat belon itu.
The balloon will rise upwards because the buoyant force is greater than the total weight of the balloon.
(c) (i) $V = p \times l \times t$
$3000 = p \times 25 \times 15$
$p = 8$ cm
(ii) Daya apungan = Berat air disesarkan = ρVg
Buoyant force = Weight of water displaced = ρVg
$= 1000\ (2000 \times 10^{-6})\ 10$
= 20 N
(iii) Berat blok kayu = Berat air tersesar = 20 N
Weight of wooden block = Weight of water displaced
Jisim blok kayu / *Mass of wooden* block = 2 kg
$$\rho = \frac{m}{V} = \frac{2}{0.005} = 666.7\ kg\ m^{-3}$$
(iv) Isi padu bahagian blok kayu yang tidak terendam
The volume of the wood blocks that are not submerged
$= 0.05 \times 0.25 \times 0.08 = 0.01\ m_3$
Berat air disesarkan
Water weight displaced

$= \rho Vg = 1000 \times 0.01 \times 10 = 100$ N
Beban maksimum yang boleh diletakkan di atas blok kayu
The maximum load that can be placed on a wooden block
= 100 N

2.6 Prinsip Bernoulli
Bernoulli's principle

1. apabila laju suatu bendalir yang bergerak bertambah, tekanan di bendalir akan berkurang, dan sebaliknya.
when the velocity of a fluid increases, the pressure in the fluid decreases and vice versa.

2. mendekati satu sama lain, rendah
closer to each other, low

3. tinggi, sama, berkurang, bertambah, lebih tinggi
highest, same, decreases, increases, higher

4. (a) melengkung, rata, lebih laju, lebih rendah, bertekanan, rendah, tekanan lebih tinggi, daya angkat
curved, flat, bigger velocity, lower velocity, low-pressure, higher pressure, lift
(b) kelajuan yang tinggi, rendah, lebih tinggi, pembakaran lengkap
high speed, low, higher, complete combustion
(c) aerofoil terbalik, ke bawah
inverted aerofoil, downward

PRAKTIS SPM 2

KERTAS 1

Bahagian A

1. C **2.** C **3.** B **4.** C **5.** B
6. B **7.** D **8.** D 9. C

KERTAS 2

Bahagian A

1. (a) (i) $\text{Jisim}_{\text{Mass}} = \frac{8}{10}$
$= 0.8$ kg
(ii) Berat cecair X yang tersesar
Weight of liquid X displaced
$= \rho Vg$
$= 1200\,(200 \times 10^{-6})10$
$= 2.4$ N
(iii) Daya apungan = Berat cecair yang tersesar
Buoyant force = Weight of liquid displaced
$= 2.4$ N
(iv) Berat bola logam itu dalam cecair X
Weight of the metal ball in liquid X
$= 8$ N $- 2.4$ N
$= 5.6$ N
(v) $\rho = \frac{m}{V} = \frac{0.8}{200 \times 10^{-6}} = 4000$ kg m^{-3}
(b) (i) Bacaan neraca spring menjadi lebih tinggi. Isi padu minyak yang disesarkan masih sama iaitu 200 cm^3.
The reading of the spring balance is higher. The volume of oil that is displaced is still the same which is 200 cm^3.
(ii) Daya apungan adalah lebih kecil kerana ketumpatan minyak adalah lebih kecil. Maka berat ketara menjadi lebih besar. Isi padu minyak yang disesarkan masih 200 cm^3 kerana bola logam masih terendam sepenuhnya dalam minyak
The buoyant force is smaller because the density of the oil is smaller. The apparent weight becomes greater. The volume of oil displaced is still 200 cm^3 because the metal ball is still completely immersed in the oil.

Bahagian B

2. (a) Aerofoil
(b) (i)
- Bentuk keratan rentas sayap peluncur menyebabkan kelajuan aliran udara.
The shape of cross section of the wing causes the speed of airflow.
- Kelajuan aliran udara di atas sayap peluncur lebih tinggi daripada kelajuan aliran udara di bawah.
The speed of airflow above the wings is higher than the speed of airflow below

- Apabila kelajuan udara yang bergerak yang lebih tinggi, tekanan yang lebih rendah.
  When the speed of moving air is higher, the pressure is lower
- Oleh itu tekanan udara di bawah sayap adalah lebih tinggi berbanding dengan di atas sayap
  Hence air pressure below the wings is higher compare to above the wings

(ii) Prinsip Bernoulli / *Bernoulli's principle*

(c)
- Bentuk keratan rentas yang bahagian atas melengkung dan bahagian bawah rata untuk menghasilkan kelajuan aliran udara di atas sayap lebih tinggi daripada kelajuan aliran udara di bawah.
  A shape of cross section which is curved top and a flat bottom to produce the speed of airflow above the wings to be higher than the speed of airflow below
- Luas permukaan sayap yang lebih besar. Lebih besar daya angkat.
  Larger surface area of the wing. Produces bigger lift.
- Ketumpatan bahan sayap yang kecil. Menghasilkan daya paduan ke atas yang besar.
  The smaller density of the wing materials. Produce bigger upward resultant force.
- Jenis bahan yang boleh tahan lama dan ringan (Gentian kaca). Ia tahan lebih lama dan daya angkat yang lebih besar.
  The type of material that can be durable and lightweight (Fibre glass). It lasts longer and has greater lift.
- Pilihan yang paling sesuai adalah *P*. Kerana ia mempunyai bentuk keratan rentas yang bahagian atas melengkung dan bahagian bawah rata, kawasan sayap yang luas permukaan lebih besar, ketumpatan bahan sayap yang kecil, diperbuat daripada bahan ringan dan tahan lama.
  The most suitable option is P. Because it has a cross-sectional shape in which the top is curved and the bottom is flat, the wing area of the surface area is larger, the density of the wing material is small, it is made of lightweight and durable material.

(d) (i) $P = F/A$
$F = PA$
$F = 300 \times 2.5$
$F = 750$ N

(ii) Daya Paduan / *Resultant force*
$= 750 - 500$
$= 250$N

(iii) $F = ma$
$a = F/m$
$a = 250/50$
$= 5.0 \text{ m s}^{-2}$

Bahagian C

3. (a) Tekanan ditakrifkan sebagai daya normal per unit luas.
Pressure is defined as normal force per unit area.

(b) (i) Tekanan pada omboh *X* = tekanan pada omboh *Y*
Pressure on piston X = pressure on piston Y

(ii) Luas keratan rentas omboh *Y* adalah lebih besar daripada luas keratan rentas omboh *X*.
Cross sectional-area of piston Y is bigger than cross-sectional area of piston X.

(iii) Daya bertindak pada omboh *Y* adalah lebih besar daripada daya bertindak ke atas omboh *X*.
Force acted on piston Y is bigger than force acted on piston X.
Oleh itu, semakin besar luas keratan rentas *Y*, lebih besar daya yang bertindak
Thus, the bigger the cross-sectional area of Y, the greater the force acting.

(iv) Prinsip Pascal
Pascal's principle

(c)
- Garis Plimsoll ialah garis rujukan ditandakan pada badan kapal untuk memastikan bahawa kapal dan bot dimuatkan dalam had keselamatan.
  Plimsoll line is a reference line marked on the body of ships to ensure that ships and boats are loaded within the safety limits.

- Ketumpatan air berbeza mengikut lokasi disebabkan oleh suhu yang berbeza dan kemasinan air.
  The density of water varies with locations due to different temperature and salinity of water.
- Kapal terapung lebih mendalam dalam air tawar kerana ia adalah kurang tumpat daripada air laut masin.
  A ship floats deeper in fresh water as it is less dense than salty seawater.
- Kapal terapung lebih mendalam dalam air laut panas kerana air panas kurang tumpat daripada air laut sejuk.
  A ship floats deeper in warm seawater because warm water is less dense than cold seawater.

(d)

Reka bentuk ***Design***	**Reasons** ***Sebab***
Dinding tebal *Thick wall*	Boleh manahan peningkatan tekanan air dengan kedalaman yang tinggi *Can withstand increasing water pressure with high depth*
Bahan kekuatan tinggi *High strength material*	Untuk menahan tekanan air yang tinggi pada kedalaman yang tinggi *To withstand high water pressure at high depths*
Bahan ketumpatan tinggi *High density material*	Jisim bahan yang lebih besar membenarkan kapal selam tenggelam dengan mudah *Bigger mass allow the submarine to submerge easily*
Bentuk larus *Streamline shape*	Keupayaan untuk mengurangkan rintangan air *Ability to reduce water resistance*
Tangki balast lebih besar *Bigger ballast tank*	Dapat menambah atau mengurangkan berat badan supaya dapat terapung dan tenggelam dengan lebih berkesan *Can increase or decrease the weight to be able to float and sink more effectively*