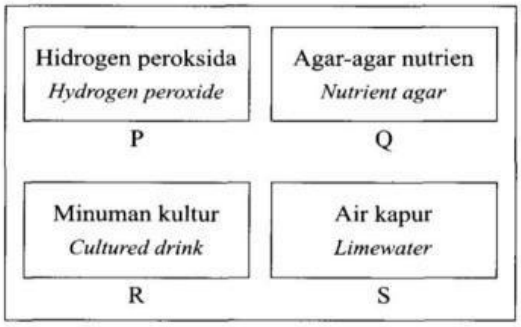
1 Rajah 1 menunjukkan bahan sisa bagi suatu eksperimen.
Diagram 1 shows the waste substances of an experiment.



Rajah 1
Diagram 1

Antara padanan berikut, yang manakah betul?
Which of the following pairs are correct?

	Bahan yang boleh dibuang ke dalam singki ***Substances that can be disposed of into the sink***	**Bahan yang tidak boleh dibuang ke dalam singki** ***Substances that cannot be disposed of into the sink***
A	R, S	P, Q
B	P, R	Q, S
C	Q, S	P, R
D	Q, R	P, S

2 Rajah 2 menunjukkan sejenis alat pemadam kebakaran.
Diagram 2 shows a type of fire extinguisher.

Rajah 2
Diagram 2

Antara yang berikut, bahan yang manakah sesuai dipadamkan oleh pemadam api tersebut?
Which of the following substances is suitable to be extinguished by the fire extinguisher?

A Cat
Paint
B Kain
Cloth
C Minyak masak
Cooking oil
D Peralatan elektrik
Electrical appliances

3 Semasa melakukan teknik *Heimlich Manoeuvre*, bahagian di antara pusat dengan bawah rusuk perlu ditekan dan disentak ke atas dengan kuat dan cepat.
Mengapakah tindakan itu dilakukan?
While performing Heimlich Manoeuvre, the area between the navel and below the ribs need to be pressed and jerked upwards with quick force.
Why is that action taken?

A Meningkatkan daya pernafasan pada salur pernafasan
To increase breathing force in the respiratory tract
B Meningkatkan diameter salur pernafasan
To increase the diameter of the respiratory tract
C Meningkatkan tekanan di dalam peparu
To increase pressure in the lungs
D Meningkatkan isi padu udara di dalam peparu
To increase air volume in the lungs

4 Ali dan ayahnya sedang menonton televisyen di rumah. Tiba-tiba, ayahnya terkena serangan jantung lalu pengsan dan tidak dapat bernafas.

Ali telah melakukan Resusitasi Kardiopulmonari (CPR) kepada ayahnya sehingga ayahnya boleh bernafas semula tetapi dia masih belum sedar.

Apakah yang perlu dilakukan oleh Ali?

Ali and his father are watching television at home. Suddenly, his father had a heart attack, fainted and could not breathe.

Ali has performed Cardiopulmonary Resuscitation (CPR) *on his father until he can breathe again but he is still unconscious.*

What does Ali need to do?

A Lakukan tekanan dada sehingga ayahnya sedar
Perform chest compression until his father is conscious
B Ubah kedudukan badan ayahnya kepada keadaan mengiring
Change his father's body position on his side
C Dongakkan kepala ayahnya ke belakang dan angkat dagunya
Tilt his father's head back and lift his chin
D Bangun dan condongkan badan ayahnya sedikit ke depan
Rise and lean his father's body slightly to the front

5 Rajah 3 menunjukkan bacaan tekanan darah bagi seorang pesakit.
Diagram 3 shows a blood pressure reading of a patient.

150 / 95 mmHg

Rajah 3
Diagram 3

Apakah yang akan berlaku pada pesakit itu jika bacaan tersebut kekal berterusan?
What will happen to the patient if the reading continues constantly?

A Hipertensi
Hypertension
B Keracunan darah
Blood poisoning
C Kegagalan dalam sistem pernafasan
Failure in respiratory system
D Kekurangan oksigen dalam darah
Lack of oxygen in blood

6 Ariana mempunyai ketinggian 1.54 m dan berjisim 55 kg.
Ariana has a height of 1.54 m *and mass of* 55 kg.

Apakah kategori Indeks Jisim Badan (BMI) Ariana?
What is the category of Ariana's Body Mass Index?

$$\left[\text{BMI} = \frac{\text{Jisim badan (kg)}}{(\text{Ketinggian})^2\ (\text{m}^2)}\right]$$

$$\left[\text{BMI} = \frac{\textit{Body mass}\ (\text{kg})}{(\textit{Height})^2\ (\text{m}^2)}\right]$$

	BMI	**Kategori** *Category*
A	< 18.5	Kurang jisim badan *Underweight*
B	18.5 – 24.9	Jisim badan unggul *Desirable weight*
C	25.0 – 29.9	Berlebihan jisim badan *Overweight*
D	≥ 30.0	Obes *Obese*

7 Maklumat berikut menunjukkan kesan-kesan aktiviti manusia.
The following information shows the effects of human activities.

- Kemusnahan habitat
  Habitat destruction
- Hakisan tanah
  Soil erosion
- Banjir kilat
  Flash flood

Antara yang berikut, yang manakah punca kejadian di atas?
Which of the following is the cause of the situations above?

A Perlombongan
Mining
B Penyahhutanan
Deforestation
C Pembuangan sisa
Waste disposal
D Pembakaran terbuka
Open burning

8 Apakah kromosom bagi anak apabila satu ovum disenyawakan dengan sperma yang membawa kromosom 22 + X?
What is the chromosome of a child when an ovum is fertilised by sperm which carries 22 + X *chromosome?*

A 22 + X
B 22 + Y
C 44 + XX
D 44 + XY

9 Antara yang berikut, yang manakah disebabkan oleh mutasi kromosom?
Which of the following is caused by chromosome mutation?

A Albinisme
Albinism
B Hemofilia
Haemophilia
C Anemia sel sabit
Sickle cell anaemia
D Sindrom Turner
Turner syndrome

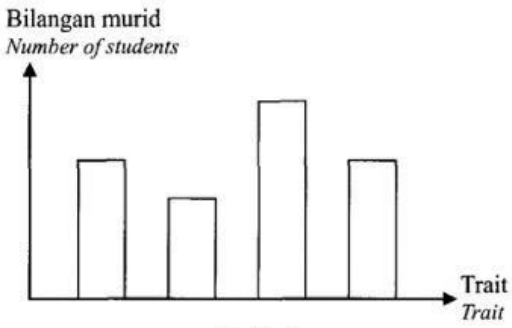
10 Maklumat berikut menunjukkan Amir yang mempunyai lesung pipit, berkahwin dengan Amira yang tidak mempunyai lesung pipit.
The following information shows that Amir who has dimples married to Amira who does not have dimples.

Induk : Dd × dd *Parent* : Dd × dd

Apakah nisbah bilangan anak yang mempunyai lesung pipit kepada bilangan anak yang tidak mempunyai lesung pipit?
What is the ratio of the number of children having dimples to the number of children who do not have dimples?

A 1:1
B 2:1
C 3:1
D 1:3

11 Rajah 4 menunjukkan satu carta palang yang mewakili sejenis variasi.
Diagram 4 shows a bar chart representing a type of variation.



Rajah 4
Diagram 4

Trait manakah yang diwakili oleh Rajah 4?
Which trait is represented by Diagram 4?

A Ketinggian
Height
B Berat badan
Body weight
C Jenis cap jari
Type of fingerprint
D Saiz tapak kaki
Size of sole of the feet

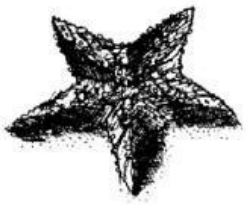
12 Rajah 5 menunjukkan suatu keratan rentas sendi.
Diagram 5 shows a cross-section of a joint.

Rajah 5
Diagram 5

Apakah fungsi bahagian yang berlabel **X**?
What is the function of the part labelled **X**?

A Mengurangkan geseran
Reduces friction
B Bertindak sebagai pelincir
Acts as a lubricant
C Membekalkan nutrien
Provides nutrients
D Memindahkan daya pengecutan otot
Transfers muscle contraction force

13 Rajah 6 menunjukkan sejenis haiwan.
Diagram 6 shows a type of animal.



Rajah 6
Diagram 6

Antara pernyataan berikut, yang manakah betul tentang haiwan tersebut?
Which of the following statements is correct about the animal?

A Mempunyai rangka dalam
Has an internal skeleton
B Mempunyai rangka hidrostatik
Has hydrostatic skeleton
C Lengkung pertumbuhannya adalah berperingkat
Its growth curve is in stages
D Badannya terdiri daripada lapisan kitin
The body is made up of chitin layer

14 Kelenjar endokrin yang manakah mengawal aras gula dalam darah?
Which endocrine gland controls the sugar level in blood?

A Pankreas
Pancreas

B Adrenal
Adrenal

C Tiroid
Thyroid

D Ovari
Ovary

15 Apakah kesan pengambilan alkohol secara berlebihan terhadap koordinasi badan?
What is the effect of excessive consumption of alcohol on body coordination?

A Mempercepatkan penuaan
Rapid aging

B Mengalami kerosakan otak
Experiencing brain damage

C Menyebabkan penyakit jantung
Causes heart disease

D Menyebabkan penghantaran impuls menjadi lambat
Causes impulse transmission to be slow

16 Jirim terdiri daripada zarah-zarah yang halus dan diskrit.
Apakah tiga jenis zarah yang membina jirim?
Matter consists of tiny and discrete particles.
What are the three types of particles that form a matter?

A Atom, molekul dan ion
Atom, molecule and ion

B Molekul, proton dan neutron
Molecule, proton and neutron

C Proton, neutron dan elektron
Proton, neutron and electron

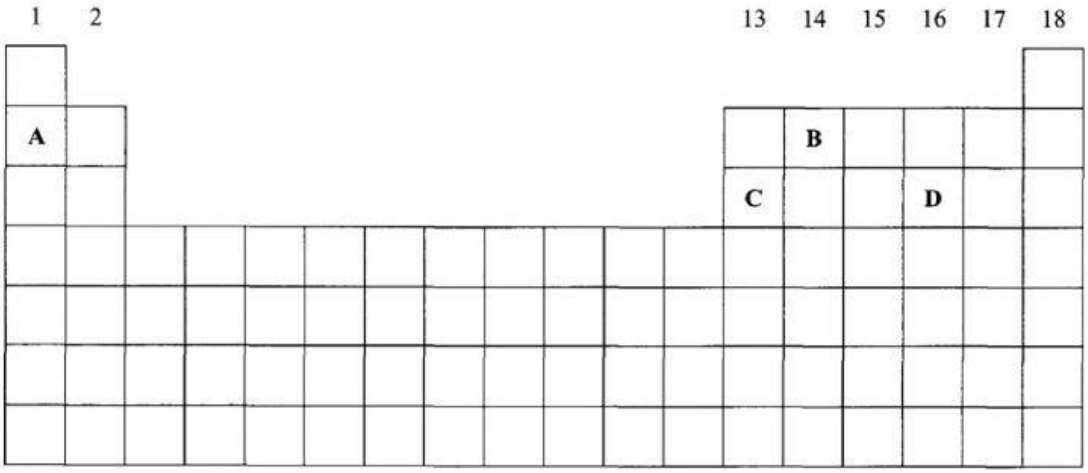
D Elektron, ion dan atom
Electron, ion and atom

17 Rajah 7 menunjukkan satu unsur dalam Jadual Berkala Unsur Moden.
Diagram 7 shows an element in the Modern Periodic Table of Elements.

$$^{16}_{32}\mathrm{X}$$

Rajah 7
Diagram 7

Kedudukan yang manakah dalam Jadual Berkala Unsur Moden adalah betul bagi unsur yang ditunjukkan dalam Rajah 7?
Which is the correct location in the Modern Periodic Table of Elements for the element shown in Diagram 7?



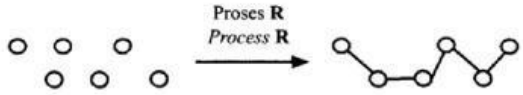
18 Antara isotop yang berikut, yang manakah digunakan untuk mengkaji kadar penyerapan baja dalam tumbuhan?
Which of the following isotopes is used to study the rate of absorption of fertiliser in plants?

A Iodin-131
Iodine-131
B Natrium-24
Sodium-24
C Fosforus-32
Phosphorus-32
D Karbon-14
Carbon-14

19 Antara yang berikut, yang manakah adalah ciri piuter yang menjadikannya sesuai untuk dibuat bahan hiasan?
Which of the following is a characteristic of pewter that makes it suitable to be made as decorative items?

A Kuat
Strong
B Ringan
Light
C Berkilat
Shiny
D Keras
Hard

20 Rajah 8 menunjukkan suatu proses untuk menghasilkan bahan polimer.
Diagram 8 shows a process to produce polymer substance.



Rajah 8
Diagram 8

Apakah proses **R**?
What is process **R**?

A Pengoksidaan
Oxidation
B Peneutralan
Neutralisation
C Pempolimeran
Polymerisation
D Penyahpolimeran
Depolymerisation

21 Tayar kereta yang diperbuat daripada getah asli didapati lebih lembut dan mudah melekit pada cuaca panas. Masalah ini dapat diatasi dengan memanaskan getah asli bersama bahan P.
Car tyre made from natural rubber becomes soft and sticky during hot weather. This problem can be solved by heating natural rubber with substance P.

Apakah P?
What is P*?*

A Karbon
Carbon
B Naftalena
Naphthalene
C Sulfur
Sulphur
D Alkohol
Alcohol

22 Apakah maklumat yang boleh diperoleh daripada luas di bawah graf halaju-masa?
What is the information that can be obtained from the area under velocity-time graph?

A Pecutan
Acceleration
B Halaju
Velocity
C Laju
Speed
D Sesaran
Displacement

23 Sebiji durian jatuh dari pokoknya. Buah durian itu mengambil masa 2 saat untuk sampai ke tanah. Berapakah halaju akhir buah tersebut sekiranya pecutan graviti ialah 9.8 m s^{-2}?
A durian falls from its tree. It takes 2 seconds to reach the ground.
What is the final velocity of the fruit if the gravitational acceleration is 9.8 m s^{-2}?

$$\left[\text{Pecutan graviti} = \frac{\text{Halaju akhir} - \text{Halaju awal}}{\text{Masa}}\right]$$

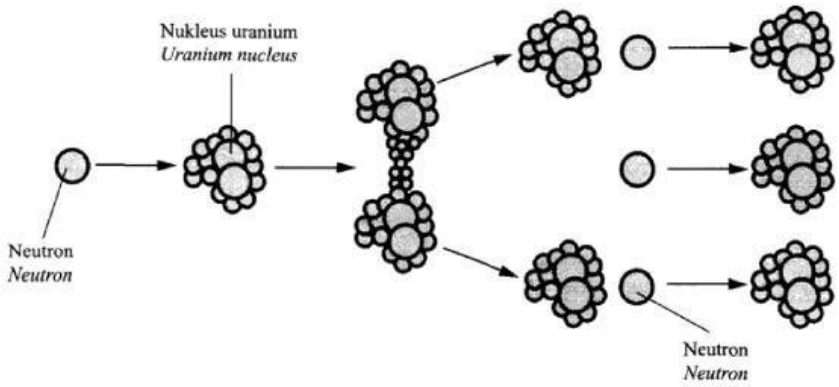
$$\left[\begin{matrix}\textit{Gravitational}\\ \textit{acceleration}\end{matrix} = \frac{\textit{Final velocity} - \textit{Initial velocity}}{\textit{Time}}\right]$$

A 4.9 m s^{-1}
B 9.8 m s^{-1}
C 11.8 m s^{-1}
D 19.6 m s^{-1}

24 Antara yang berikut, yang manakah menunjukkan kesan inersia dalam kehidupan harian?
Which of the following shows the inertia effect in daily life?

A Memutarkan payung basah untuk mengeringkannya
Spinning wet umbrella to dry it
B Kapal terbang mempunyai sayap berbentuk aerofoil
Aeroplane has aerofoil shaped wings
C Bumbung rumah terangkat semasa ribut
The house roof is lifted during a storm
D Pergerakan kapal layar di lautan
The movement of a sailing ship in the ocean

25 Rajah 9 menunjukkan suatu proses yang berlaku dalam reaktor nuklear.
Diagram 9 shows a process that happens in nuclear reactor.



Rajah 9
Diagram 9

Apakah proses tersebut?
What is the process?

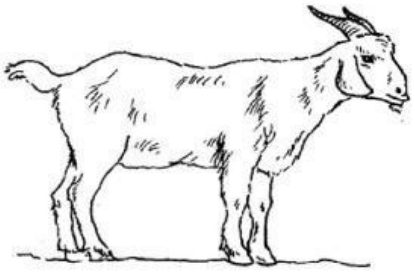
A Pelakuran nukleus
Nuclear fusion

B Pembelahan nukleus
Nuclear fission

C Pereputan radioaktif
Radioactive decay

D Pembedilan nukleus
Nuclear bombardment

26 Rajah 10 menunjukkan sejenis haiwan.
Diagram 10 shows a type of animal.



Rajah 10
Diagram 10

Apakah mikroorganisma yang membantu dalam sistem penghadamannya?
What is the microorganism that helps in its digestive system?

A Bakteria
Bacteria

B Kulat
Fungi

C Alga
Algae

D Virus
Virus

27 Jadual 1 menunjukkan keputusan suatu eksperimen untuk menentukan nilai kalori bagi suatu sampel makanan.
Table 1 shows the results of an experiment to determine the calorific value of a food sample.

Jisim sampel makanan (g) *Mass of food sample* (g)	0.3 g
Jisim air (g) *Mass of water* (g)	20 g
Suhu awal air (°C) *Initial temperature of water* (°C)	29 °C
Suhu akhir air (°C) *Final temperature of water* (°C)	57 °C

Jadual 1
Table 1

Berapakah nilai kalori bagi sampel makanan tersebut?

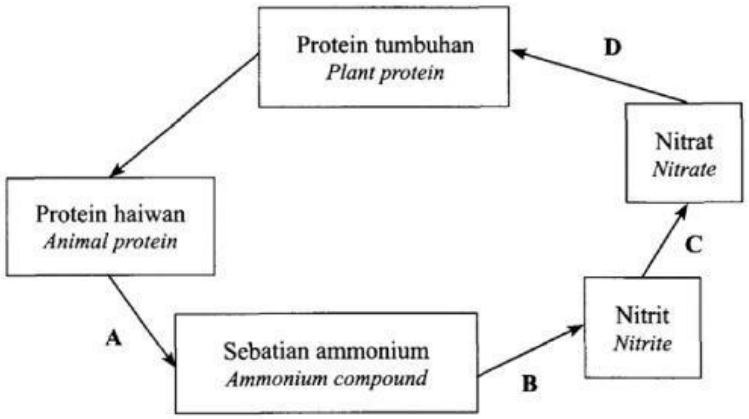
$$\left[\text{Nilai kalori} = \frac{4.2\ \text{Jg}^{-1}\,^{\circ}\text{C}^{-1} \times \text{Jisim air (g)} \times \text{Perubahan suhu air (°C)}}{\text{Jisim sample makanan (g)} \times 1000}\right]$$

What is the calorific value for the food sample?

$$\left[\textit{Calorific value} = \frac{4.2\ \text{Jg}^{-1}\,^{\circ}\text{C}^{-1} \times \textit{Mass of water (g)} \times \textit{Change in water temperature (°C)}}{\textit{Mass of food sample (g)} \times 1000}\right]$$

A $7.84\ \text{kJg}^{-1}$
B $8.12\ \text{kJg}^{-1}$
C $15.86\ \text{kJg}^{-1}$
D $15.96\ \text{kJg}^{-1}$

28 Rajah 11 menunjukkan sebahagian daripada kitar nitrogen.
Diagram 11 shows a part of nitrogen cycle.



Rajah 11
Diagram 11

Antara bahagian **A**, **B**, **C** dan **D**, yang manakah menunjukkan proses penguraian berlaku?
Which part **A**, **B**, **C** *or* **D** *shows the decomposition process occurs?*

29 Unsur manakah yang merupakan makronutrien?
Which element is a macronutrient?

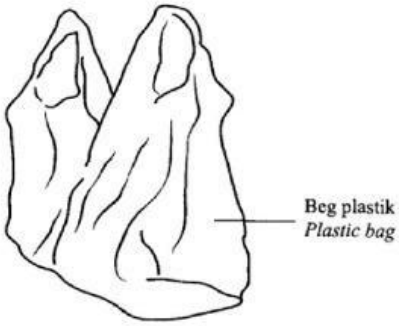
A Zink
Zinc

B Boron
Boron

C Nitrogen
Nitrogen

D Mangan
Manganese

30 Rajah 12 menunjukkan suatu objek.
Diagram 12 shows an object.



Rajah 12
Diagram 12

Mengapakah objek tersebut perlu dikitar semula?
Why does this object need to be recycled?

A Bersifat mesra alam
Environmental friendly

B Tidak terbiodegradasi
Non-biodegradable

C Tidak termusnah oleh haba
Does not destroy by heat

D Bertindak balas dengan bahan kimia
React with chemical substance

31 Seorang petani mempunyai sebidang kebun di tepi sungai. Setiap petang dia menyembur tanamannya dengan sejenis racun serangga bagi memastikan tanamannya hidup dengan subur.
Berdasarkan situasi di atas, apakah jenis pencemaran yang mungkin berlaku jika racun serangga itu tidak digunakan dengan betul?
A farmer owns a farm near a river. Every evening, he sprays his crops with a type of pesticide to ensure his crops grow healthily.
Based on the situation above, what is the possible type of pollution might occur if the pesticide is not used correctly?

A Pencemaran terma
Thermal pollution

B Pencemaran udara
Air pollution

C Pencemaran air
Water pollution

D Pencemaran bau
Smell pollution

32 Jadual 2 menunjukkan keputusan bagi suatu tindak balas antara logam dengan air.
Table 2 shows the results of a reaction between metal and water.

Masa (s) *Time* (s)	0	15	30	45	60	75	90	105	120
Isi padu gas (cm^3) *Volume of gas* (cm^3)	0	12	20	24	27	29	30	30	30

Jadual 2
Table 2

Berdasarkan Jadual 2, berapakah kadar tindak balas purata keseluruhan?
Based on Table 2, what is the average rate of reaction for the whole reaction?

$$\left[\text{Kadar tindak balas purata keseluruhan} = \frac{\text{Jumlah isi padu gas}}{\text{Masa yang diambil}}\right]$$

$$\left[\textit{Average rate of reaction for the whole reaction} = \frac{\textit{Total volume of gas}}{\textit{Time taken}}\right]$$

A $0.25\ cm^3s^{-1}$

B $0.33\ cm^3s^{-1}$

C $0.80\ cm^3s^{-1}$

D $1.68\ cm^3s^{-1}$

33 Antara yang berikut, yang manakah merupakan sebatian karbon organik?
Which of the following is an organic carbon compound?

A Ester
Ester

B Sianida
Cyanide

C Kalsium karbonat
Calcium carbonate

D Karbon dioksida
Carbon dioxide

34 Rajah 13 menunjukkan persamaan perkataan bagi suatu tindak balas kimia.
Diagram 13 shows a word equation of a chemical reaction.

Glukosa *Glucose* + Yis *Yeast* → X + Karbon dioksida *Carbon dioxide*

Rajah 13
Diagram 13

Apakah ciri-ciri bagi X?
What is the characteristic of X?

A Menyalakan kayu uji berbara
Lights up a glowing wooden splinter

B Mempunyai takat didih yang tinggi
Has a high boiling point

C Menyebabkan air kapur menjadi keruh
Causes limewater to turn cloudy

D Bertindak balas dengan asid organik untuk menghasilkan ester
Reacts with organic acid to produce ester

35 Larutan zink klorida cair, $ZnCl_2$ dielektrolisis dengan menggunakan elektrod karbon.
Ion manakah tertarik ke anod dan katod?
Diluted zinc chloride, $ZnCl_2$ solution is electrolysed using carbon electrodes.
Which ions are attracted to the anode and the cathode?

	Anod *Anode*	**Katod** *Cathode*
A	Cl^-	Zn^{2+}
B	Zn^{2+}	Cl^-
C	Zn^{2+} , H^+	Cl^- , OH^-
D	Cl^- , OH^-	Zn^{2+} , H^+

36 Rajah 14 menunjukkan maklumat tentang elektrolisis larutan akueus.
Diagram 14 shows the information about electrolysis of an aqueous solution.

Faktor yang mempengaruhi elektrolisis bagi larutan akueus
Factor that affects the electrolysis of an aqueous solution

Kepekatan ion dalam elektrolit *Concentration of ions in the electrolyte* | **Y** | Jenis elektrod yang digunakan *Type of electrode used*

Rajah 14
Diagram 14

Apakah **Y**?
What is **Y**?

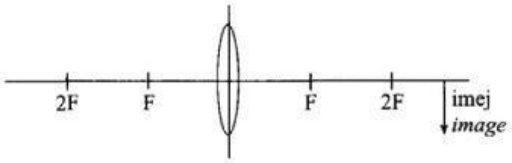
A Isi padu elektrolit
Volume of electrolyte

B Kedudukan logam dalam siri kereaktifan
Position of metal in the reactivity series

C Keelektropositifan logam
Electropositivity of metals

D Kedudukan ion dalam siri elektrokimia
Position of ion in the electrochemical series

37 Rajah 15 menunjukkan satu gambar rajah sinar yang tidak lengkap.
Diagram 15 shows an incomplete ray diagram.



Rajah 15
Diagram 15

Antara kedudukan objek yang berikut, yang manakah akan menghasilkan imej seperti di Rajah 15?
Which of the following positions of the object will produce the image as in Diagram 15?

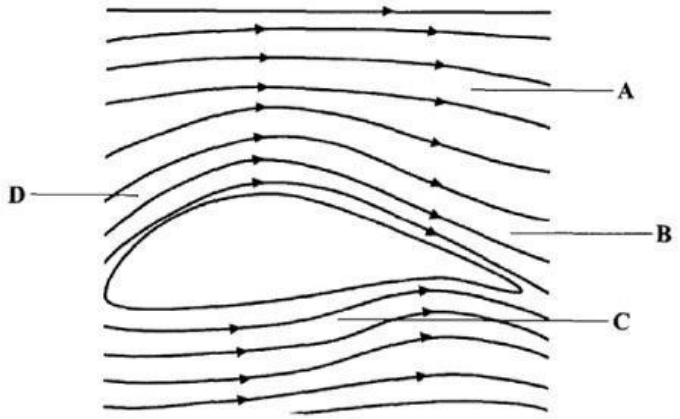
A Antara F dengan 2F
Between F and 2F

B Kurang daripada F
Less than F

C Pada F
At F

D Lebih daripada 2F
More than 2F

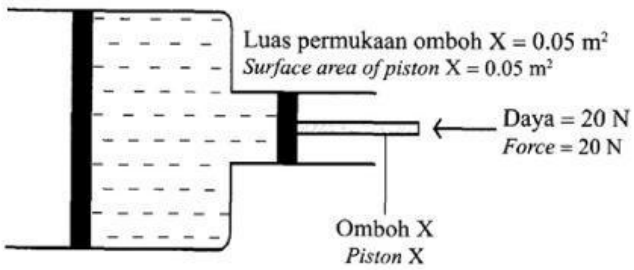
38 Rajah 16 menunjukkan keratan rentas sayap sebuah kapal terbang semasa berlepas.
Diagram 16 shows a cross-section of an aeroplane wing during take off.



Rajah 16
Diagram 16

Antara **A**, **B**, **C** dan **D**, yang manakah menunjukkan aliran udara yang lebih perlahan?
Which of **A**, **B**, **C** *or* **D** *shows a slower air flow?*

39 Rajah 17 menunjukkan satu sistem hidraulik.
Diagram 17 shows a hydraulic system.



Rajah 17
Diagram 17

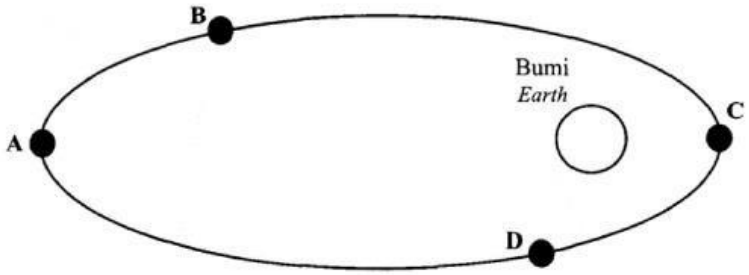
Berapakah tekanan yang dihasilkan pada omboh X?
What is the pressure produced by piston X?

$$\left[\text{Tekanan} = \frac{\text{Daya}}{\text{Luas permukaan}}\right]$$

$$\left[\textit{Pressure} = \frac{\textit{Force}}{\textit{Surface area}}\right]$$

A $0.0025\ \text{Nm}^{-2}$
B $1\ \text{Nm}^{-2}$
C $40\ \text{Nm}^{-2}$
D $400\ \text{Nm}^{-2}$

40 Rajah 18 menunjukkan kedudukan satelit dalam orbit elips.
Diagram 18 *shows the positions of satelites in an elliptical orbit.*



Rajah 18
Diagram 18

Antara **A**, **B**, **C** dan **D**, yang manakah kedudukan yang dikenali sebagai apogi?
Which of **A**, **B**, **C** *or* **D** *is the position known as apogee*?