Bahagian A / Section A

5.1 Sifat Fizik Air
Physical Characteristics of Water

1 Air merupakan keperluan asas bagi semua hidupan di Bumi. Antara berikut, yang manakah merupakan sifat fizik air tulen?
Water is a basic need of all living things on Earth. Which of the following is the physical property of pure water?

A Wujud sebagai cecair pada suhu 0 °C
Exists as liquid at 0 °C

B Mempunyai tegangan permukaan yang tinggi
Has a high surface tension

C Ketumpatan air ialah 0.1 g cm^{-3}
The density of water is 0.1 g cm^{-3}

D Air meliputi lebih 60% permukaan Bumi
Water covers over 60% of the Earth's surface

TP1 BT ms. 96

2 Rajah 1 menunjukkan ayak-ayak pada permukaan air.
Diagram 1 shows a water strider on the surface of water.

Rajah 1 / *Diagram 1*

Apakah fenomena yang membantu ayak-ayak tersebut terapung pada permukaan air?
What is the phenomenon that helps a water strider to float on the surface of the water?

A Nilai takat didih air yang tinggi
High boiling point of water

B Tindakan kapilari pada permukaan air
Capillary action on water surface

C Air mempunyai daya lekitan antara molekul di permukaan
Water has a cohesive force between the molecules of water at the surface

D Air kurang tumpat berbanding dengan ayak-ayak
Water is less dense compared to water strider

TP3 BT ms. 96

3 Antara berikut, yang manakah benar mengenai tindakan kapilari?
Which of the following is true about the action of capillaries?

A Membolehkan air dibawa dari akar ke daun tumbuhan
Allows water to be carried from the roots to the leaves of the plant

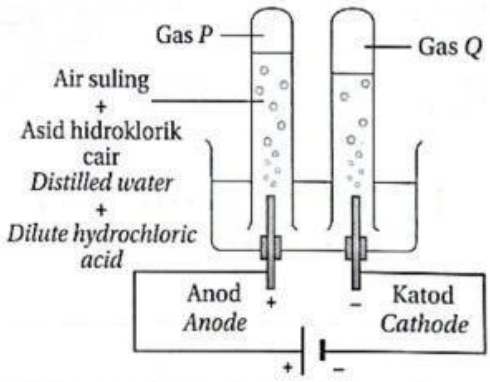
B Ayak-ayak dapat terapung di atas permukaan air
A water strider can float on the surface of the water

C Berlaku di dalam sel haiwan
Occurs in animal cells

D Melibatkan daya lekitan antara molekul air sahaja
Involves the adhesion force between water molecules only

TP2 BT ms. 96

4 Rajah 2 menunjukkan proses elektrolisis air.
Diagram 2 shows the process of electrolysis of water.



Rajah 2 / *Diagram 2*

Apakah ciri bagi gas *P*?
What is the characteristic of gas P?

A Mengeruhkan air kapur
Makes lime water cloudy

B Menyalakan kayu uji berbara
Burns a glowing wooden splinter

C Diperlukan untuk fotosintesis
Needed for photosynthesis

D Mengeluarkan bunyi 'pop' apabila diuji dengan kayu uji menyala
Produces a 'pop' sound when tested with a burning wooden splinter

TP4 BT ms. 98 KBAT *Menganalisis*

5 Pernyataan di bawah menunjukkan ciri-ciri suatu proses.
The statement below shows the characteristics of a process.

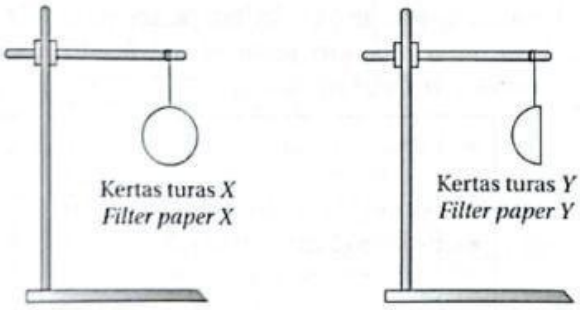
- Menukarkan air menjadi wap
  Converts water into steam
- Berlaku di permukaan air
  Occurs on the surface of water
- Berlaku pada sebarang suhu
  Occurs at any temperature
- Molekul air di permukaan mempunyai tenaga kinetik yang lebih tinggi
  The molecules of water at the surface have higher kinetic energy

Apakah proses tersebut?
What is the process?

A Kondensasi
Condensation
B Peleburan
Melting
C Pendidihan
Boiling
D Penyejatan
Evaporation

TP2 BT ms. 97

6 Rajah 3 menunjukkan satu eksperimen untuk mengkaji faktor yang mempengaruhi kadar penyejatan.
Diagram 3 shows an experiment to study the factor that affects the rate of evaporation.



Rajah 3 / *Diagram 3*

Apakah faktor yang diuji dalam eksperimen ini?
What is the factor tested in this experiment?

A Pergerakan udara
Movement of air
B Suhu persekitaran
Surrounding temperature
C Kelembapan udara
Humidity
D Luas permukaan yang terdedah
Exposed surface area

TP3 BT ms. 101

5.2 Larutan dan Kadar Keterlarutan
Solution and Rate of Solubility

7 Rajah 4 menunjukkan gula, air dan air gula.
Diagram 4 shows sugar, water and syrup.

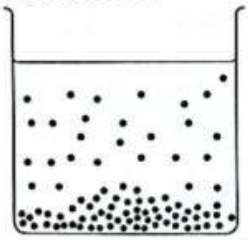
Rajah 4 / *Diagram 4*

Antara berikut, yang manakah benar mengenai Rajah 4?
Which of the following is true about Diagram 4?

	Gula *Sugar*	Air *Water*	Air gula *Syrup*
A	Pelarut *Solvent*	Zat terlarut *Solute*	Larutan *Solution*
B	Zat terlarut *Solute*	Larutan *Solution*	Pelarut *Solvent*
C	Larutan *Solution*	Zat terlarut *Solute*	Pelarut *Solvent*
D	Zat terlarut *Solute*	Pelarut *Solvent*	Larutan *Solution*

TP3 BT ms. 106

8 Rajah 5 menunjukkan satu larutan *X*.
Diagram 5 shows solution X.



Rajah 5 / *Diagram 5*

Pernyataan yang manakah mengenai larutan *X* adalah benar?
Which statement is true about solution X?

A Kuantiti zat terlarut yang sedikit di dalam pelarut
Less amount of solute in the solvent
B Tidak boleh melarutkan zat terlarut lagi dan menghasilkan mendakan
Cannot dissolve any more solute and form precipitate
C Boleh melarutkan sedikit sahaja lagi zat terlarut
Can dissolve a little more solute
D Kuantiti zat terlarut yang banyak di dalam pelarut
More amount of solute in the solvent

TP3 BT ms. 107 - 111

9 Rajah 6 menunjukkan *R* yang biasa digunakan oleh tukang gunting rambut.
Diagram 6 shows R, which is commonly used by barbers.

Rajah 6 / *Diagram 6*

Apakah *R*?
What is R?

A Larutan
Solution
B Ampaian
Suspension
C Pelarut
Solvent
D Koloid
Colloid

TP2 BT ms. 111

5.3 Pembersihan dan Pembekalan Air
Water Purification and Water Supply

10 Antara berikut, kaedah pembersihan air yang manakah dapat membunuh mikroorganisma?
Which of the following water purification methods can kill microorganisms?

I Pendidihan
Boiling
II Pengklorinan
Chlorination
III Penurasan
Filtration
IV Pengoksidaan
Oxidation

A I dan II
I and II
B II dan III
II and III
C III dan IV
III and IV
D I dan IV
I and IV

TP2 BT ms. 114

11 Semasa proses pengklorinan dan pemfluoridaan dalam sistem pembekalan air, natrium fluorida dimasukkan ke dalam air. Apakah kesan kepada pengguna jika natrium fluorida tidak dimasukkan dalam air semasa proses ini?
During the process of chlorination and fluoridation in a water supply system, sodium fluoride is introduced into the water. What is the effect on the consumer if sodium fluoride is not included in the water during this process?

A Menyebabkan keracunan makanan
Causes food poisoning
B Menyebabkan tahap kealkalian air menjadi terlalu tinggi
Causes the alkalinity of the water to be too high
C Boleh mengakibatkan masalah pereputan gigi
Can lead to tooth decay problems
D Mikroorganisma dalam air tidak dapat disingkirkan
Microorganisms in water cannot be eliminated

TP3 BT ms. 117

12 Apakah tujuan memasukkan kapur mati atau kalsium hidroksida semasa proses penggumpalan dalam prosedur pembersihan air?
What is the purpose of adding slake lime or calcium hydroxide during the coagulation process in water purification process?

A Menyingkirkan bendasing
To remove large suspended particles
B Mengurangkan keasidan air
To reduce acidity of water
C Menyingkirkan bau yang kurang menyenangkan
To eliminate unpleasant odour
D Membunuh mikroorganisma di dalam air
To kill microorganisms in water

TP3 BT ms. 117

13 Berikut merupakan beberapa peruntukan undang-undang berkaitan pencemaran air.
The following are some of the legal provisions related to water pollution.

- PPKAS (Buangan Terjadual) 2005
  Environmental Quality (Schedule Wastes) Regulations 2005
- PPKAS (Kumbahan) 2009
  Environmental Quality (Sewage) Regulations 2009

Antara berikut, bahan pencemar air yang manakah berkait dengan pembentukan undang-undang di atas?
Which of the following water pollutants is related to the formation of the above law?

A Bahan kimia dalam pertanian
Chemicals in agriculture
B Bahan buangan domestik
Domestic waste
C Bahan buangan industri
Industrial waste
D Tumpahan minyak
Oil spillage

TP1 BT ms. 118