

SPM EXAMINATION PAPER 2016

PAPER 1

Time: 1 hour and 15 minutes

Instructions: This question paper consists of 50 questions. Answer all questions.

Arahan: Kertas soalan ini mengandungi 50 soalan. Jawab semua soalan.

- 1 A patient is suffering from diabetes.

Which endocrine gland is malfunction?

Seorang pesakit menghidap penyakit kencing manis.

Apakah kelenjar endokrin yang gagal berfungsi?

A Thyroid

Tiroid

B Adrenal

Adrenal

C Pancreas

Pankreas

D Pituitary

Pituitari

- 2 Which of the following is the effect of excessive consumption of alcohol on health?

Antara yang berikut, yang manakah kesan pengambilan alkohol secara berlebihan terhadap kesihatan?

A Liver cirrhosis

Sirosis hati

B Hepatitis

Hepatitis

C Cataract

Katarak

D Arteriosclerosis

Arteriosklerosis

- 3 Diagram 1 shows a reflex arc.

Which part A, B, C or D is the motor neurone?

Rajah 1 menunjukkan suatu arka refleks.

Antara bahagian A, B, C dan D, yang manakah neuron motor?

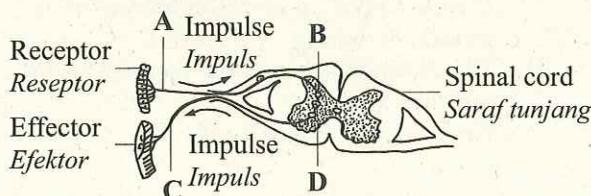
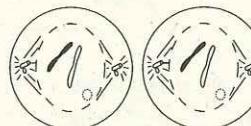


Diagram 1

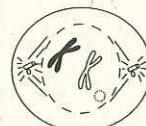
Rajah 1

- 4 Diagram 2 shows stages of mitosis process.

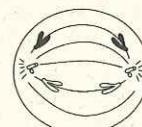
Rajah 2 menunjukkan peringkat-peringkat bagi proses mitosis.



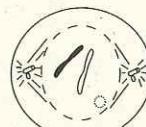
P



Q



R



S

Diagram 2

Rajah 2

Which sequence is correct?

Urutan manakah yang betul?

A P, Q, R, S

B Q, P, S, R

C R, S, P, Q

D S, Q, R, P

- 5 Which of the following agency involved in genetic research?

Antara yang berikut, agensi yang manakah terlibat dengan penyelidikan genetik?

A FAMA

LPPP

B FELDA

LKTP

C FELCRA

LPPTP

D MARDI

IPKPM

- 6 Diagram 3 shows an inheritance of traits in flower plants.

Rajah 3 menunjukkan suatu perwarisan sifat pada pokok bunga.

Parent Induk	Red flower plant Pokok bunga merah	\times	White flower plant Pokok bunga putih
First generation Generasi pertama	1	:	1
	Red flower plant Pokok bunga merah		White flower plant Pokok bunga putih

Key / Petunjuk:

M = Dominant red gene
Gen dominan merah
m = Recessive white gene
Gen resesif putih

Diagram 3

Rajah 3

What is the genotype of the parent plants?

Apakah genotip bagi pokok induk?

	Red flower plant Pokok bunga merah	White flower plant Pokok bunga putih
A	MM	mm
B	Mm	mm
C	Mm	Mm
D	MM	Mm

- 7 Which statement is correct about the structure of atom?

Penyataan manakah yang betul tentang struktur atom?

- A Have a nucleus
Mempunyai satu nukleus
- B Negatively charged neutron
Neutron bercas negatif
- C Nucleus consist of proton only
Nukleus terdiri daripada proton sahaja
- D The mass of electron is equal to the mass of neutron
Jisim elektron sama dengan jisim neutron

- 8 Diagram 4 shows the structure of atoms P, Q, R and S.

Rajah 4 menunjukkan struktur atom P, Q, R dan S.

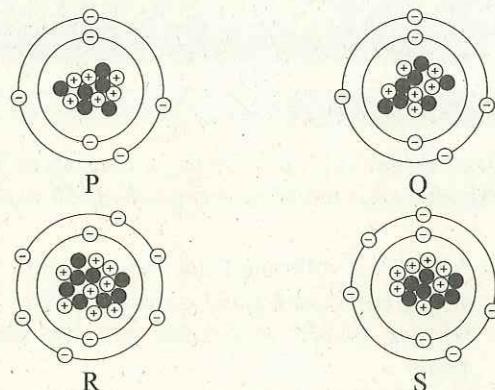


Diagram 4

Rajah 4

Which atoms are isotopes?

Atom manakah adalah isotop?

- | | |
|-----------|-----------|
| A P and Q | C Q and R |
| P dan Q | Q dan R |
| B P and S | D R and S |
| P dan S | R dan S |

- 9 When a perfume is sprayed, a nice smell is produced.

Which of the following statement is correct based on the kinetic theory of matter?

Apabila minyak wangi disembur, bau yang wangi dihasilkan.

Penyataan manakah yang betul berdasarkan teori kinetik jirim?

- A Particles of the perfume occupy space in the air
Zarah-zarah minyak wangi memenuhi ruang dalam udara
- B Condensation process occurs when perfume is sprayed
Proses kondensasi berlaku apabila minyak wangi disembur
- C The kinetic energy of the perfume particles decreases
Tenaga kinetik zarah-zarah minyak wangi semakin berkurang
- D The distance between the particles of the perfume decreases
Jarak antara zarah-zarah minyak wangi berkurang

- 10** An engineer designed the basic structure of a building that can support heavy loads as shown in Diagram 5.

Seorang jurutera mereka bentuk struktur asas sebuah bangunan yang boleh menampung beban yang berat seperti yang ditunjukkan dalam Rajah 5.

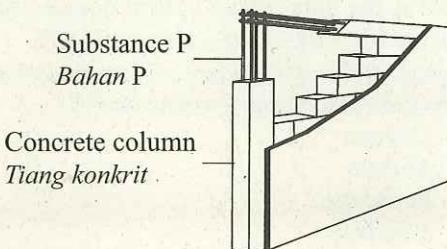


Diagram 5
Rajah 5

What is the suitable substance P to be used on its characteristic?

Apakah bahan P yang sesuai digunakan berdasarkan ciri-cirinya?

	Substance P <i>Bahan P</i>	Characteristic <i>Ciri</i>
A	Zinc <i>Zink</i>	Shiny <i>Berkilat</i>
B	Iron <i>Besi</i>	Strong <i>Kuat</i>
C	Aluminium <i>Aluminium</i>	Light <i>Ringan</i>
D	Copper <i>Kuprum</i>	Electrical conductor <i>Konduktor elektrik</i>

- 11** Diagram 6 shows a reaction that released gas Q. Rajah 6 menunjukkan satu tindak balas yang membebaskan gas Q.

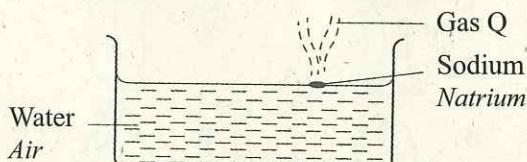


Diagram 6
Rajah 6

What is gas Q?

Apakah gas Q?

A Ammonia

Ammonia

B Oxygen

Oksigen

C Hydrogen

Hidrogen

D Carbon dioxide

Karbon dioksida

- 12** Which statement described about a physical change?

Penyataan manakah menerangkan tentang perubahan fizik?

A Reversible

Boleh berbalik

B Produce new substance

Menghasilkan bahan baharu

C Involved high heat energy

Melibatkan tenaga haba yang tinggi

D Change in the chemical properties of a substance

Perubahan pada sifat kimia sesuatu bahan

- 13** Which of the following is the characteristic of nickel-cadmium battery?

Antara yang berikut, yang manakah adalah ciri bagi bateri nikel-kadmium?

A Rechargeble

Boleh dicas semula

B Zinc is the negative terminal

Zink sebagai terminal negatif

C It is being used as car battery

Digunakan sebagai bateri kereta

D Sulphuric acid is used as electrolyte

Asid sulfurik digunakan sebagai elektrolit

- 14** Workers who are handling radioactive substance are exposed to radioactive rays.

Which of the following safety precaution should be taken by the workers?

Pekerja yang mengendalikan bahan radioaktif terdedah kepada sinar radioaktif.

Antara yang berikut, yang manakah langkah keselamatan yang perlu diambil oleh pekerja tersebut?

A Wear spectacles

Memakai cermin mata

B Sterile the apparatus after use

Mensteril peralatan selepas digunakan

C Wash hands and feet with antiseptic

Mencuci tangan dan kaki dengan antiseptik

D Wear protective attire coated with lead

Memakai pakaian pelindung yang dilapisi dengan plumbum

15 Diagram 7 shows the process of generating electricity from nuclear energy.

Rajah 7 menunjukkan proses penjanaan elektrik daripada tenaga nuklear.

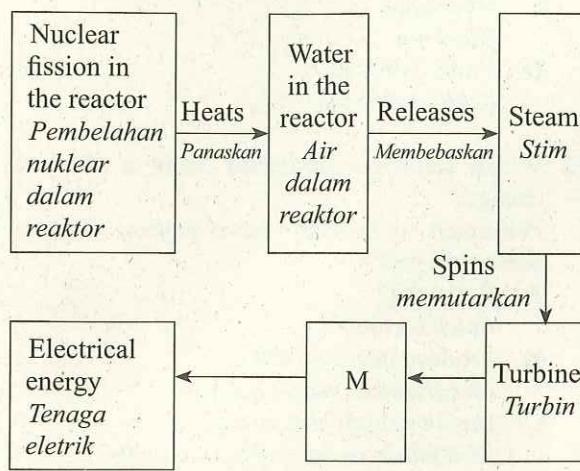


Diagram 7

Rajah 7

What is M?

Apakah M?

- A Battery
Bateri
- B Transformer
Transformer
- C Electric motor
Motor elektrik
- D Electric generator
Penjana elektrik

16 Which substance is used in archaeology?

Bahan manakah yang digunakan dalam arkeologi?

- A Carbon-14
Karbon-14
- C Iodine-131
Iodin-131
- B Cobalt-60
Kobalt-60
- D Uranium-235
Uranium-235

17 Diagram 8 shows the ray diagram for the formation of rainbow.

Rajah 8 menunjukkan rajah sinar bagi pembentukan pelangi.

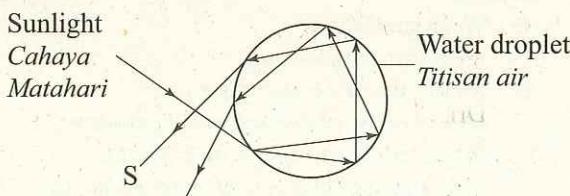


Diagram 8
Rajah 8

What is the colour of S?

Apakah warna S?

- A Orange
Jingga
- B Violet
Ungu
- C Blue
Biru
- D Red
Merah

18 What is the appropriate optical device used to observe the lunar eclipse phenomenon?

Apakah alatan optik yang sesuai digunakan untuk memerhati fenomenon gerhana bulan?

- A Camera
Kamera
- B Periscope
Periskop
- C Telescope
Teleskop
- D Microscope
Mikroskop

19 Diagram 9 shows an experiment on light dispersion using a glass object, X.

Rajah 9 menunjukkan satu eksperimen penyebaran cahaya menggunakan objek kaca, X.

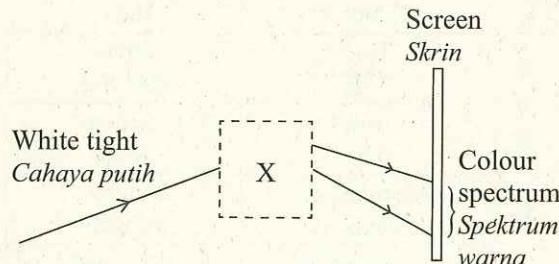


Diagram 9
Rajah 9

What is X?

Apakah X?

- A
 - B
 - C
 - D
-

- 20** What is the importance of colour to plants?
Apakah kepentingan warna kepada tumbuhan?
- A Camouflage
Penyamaran
 B Pollination
Pendebungan
 C Flower production
Penghasilan bunga
 D Seed production
Penghasilan biji benih

- 21** Which substance is an alloy?
Bahan manakah merupakan suatu aloi?
- | | |
|--------------------------|--------------------------------|
| A Iron
<i>Besi</i> | C Copper
<i>Kuprum</i> |
| B Steel
<i>Keluli</i> | D Aluminium
<i>Aluminum</i> |
- 22** Which process produce ammonia in industry?
Proses manakah yang menghasilkan ammonia dalam industri?
- A Haber process
Proses Haber
 B Purification process
Proses penulenan
 C Fermentation process
Proses penapaian
 D Decomposition process
Proses penguraian

- 23** Which disease is caused by virus?
Penyakit manakah yang disebabkan oleh virus?
- A Tinea
Panau
 B Dengue
Denggi
 C Cholera
Taun
 D Gonorrhea
Gonorea

- 24** Choose the correct pair of waste substance and its management method.
Pilih pasangan yang betul antara bahan buangan dan cara pengurusannya.

	Waste substance <i>Bahan buangan</i>	Management method <i>Cara pengurusan</i>
A	Toxic waste <i>Sisa toksik</i>	Recycle <i>Kitar semula</i>
B	Sewage <i>Air kumbahan</i>	Flowed into river <i>Dialarkan ke sungai</i>
C	Garbage <i>Sampah sarap</i>	Burnt <i>Dibakar</i>
D	Old rubber tree <i>Pokok getah tua</i>	Make into furniture <i>Dijadikan perabot</i>

- 25** Diagram 10 shows the effect of solution X on the growth of bacteria.
Rajah 10 menunjukkan kesan larutan X ke atas pertumbuhan bakteria.

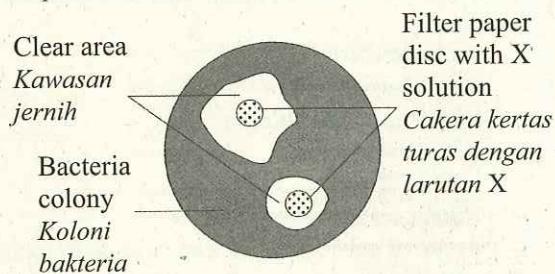


Diagram 10
Rajah 10

What is substance X?

Apakah bahan X?

- | | |
|----------------------------|-----------------------------------|
| A Drugs
<i>Dadah</i> | C Antiserum
<i>Antiserum</i> |
| B Vaccine
<i>Vaksin</i> | D Antibiotic
<i>Antibiotik</i> |

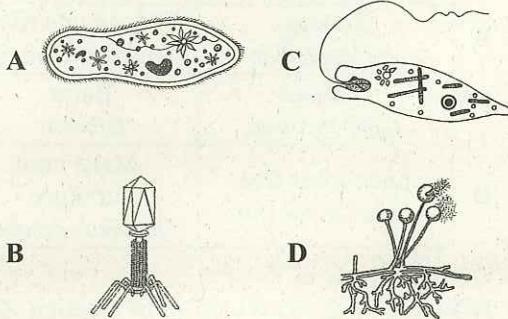
- 26** A student wish to visit her grandfather in the area that experiencing a cholera epidemic. Which action should be taken to prevent infection of the disease?

Seorang pelajar ingin menziarahi datuknya di kawasan yang sedang mengalami wabak taun. Apakah langkah yang perlu diambil untuk mencegah daripada dijangkiti penyakit tersebut?

- A Maintain personal hygiene
Menjaga kebersihan diri
 B Drink boiled water
Minum air yang telah dididihkan
 C Consume a balance diet
Mengambil makanan seimbang
 D Get antibiotic injection
Mendapatkan suntikan antibiotik

- 27 Which microorganism can carry out photosynthesis?

Mikroorganisma manakah yang boleh menjalankan proses fotosintesis?



- 28 A patient shows symptoms below:

Seorang pesakit menunjukkan simptom-simptom berikut:

- Prolonged cough
Batuk berpanjangan
- Blood contains phlegm
Kahak berdarah
- Lost of appetite
Hilang selera makan

What type of substance that can be used to treat the patient?

Apakah jenis bahan yang boleh digunakan untuk merawat pesakit tersebut?

- A Antibiotic
Antibiotik
- B Antibody
Antibodi
- C Antiserum
Antiserum
- D Antiseptic
Antiseptik

- 29 Diagram 11 shows root of a plant.

Rajah 11 menunjukkan akar sejenis tumbuhan.

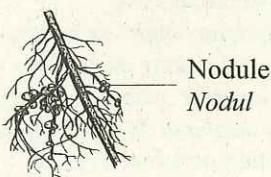


Diagram 11
Rajah 11

Which plant has the above root?

Tumbuhan yang manakah mempunyai akar di atas?

- | | |
|-------------------------------------|---------------------------|
| A Ground nut
<i>Kacang tanah</i> | C Spinach
<i>Bayam</i> |
| B Tapioca
<i>Ubi kayu</i> | D Maize
<i>Jagung</i> |

- 30 Diagram 12 shows a symptom caused by malnutrition.

Rajah 12 menunjukkan simptom penyakit akibat malnutrisi.

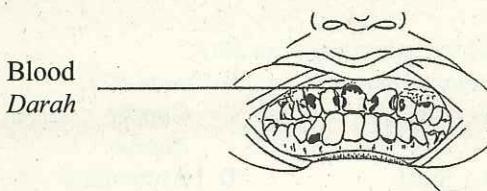


Diagram 12
Rajah 12

Which nutrient deficiency will cause the above disease?

Kekurangan nutrien manakah yang menyebabkan penyakit di atas?

- | | |
|-------------|-------------|
| A Vitamin A | C Vitamin C |
| B Vitamin B | D Vitamin D |

- 31 Table 1 shows the menu of breakfast taken by student R and S.

Jadual 1 menunjukkan menu sarapan pagi yang diambil oleh murid R dan murid S.

Student <i>Murid</i>	Menu <i>Menu</i>	Calories content (kJ) <i>Kandungan kalori (kJ)</i>
R	250 g Nasi lemak <i>Nasi lemak</i> 200 g Orange juice <i>Jus oren</i>	635 200
S	300 g Fried rice <i>Nasi goreng</i> 200 g Milk <i>Susu</i>	400 170

Table 1
Jadual 1

Calculate the calories difference taken by the students.

Kira perbezaan kalori yang diambil oleh murid-murid itu.

- | | |
|----------|------------|
| A 30 kJ | C 265 kJ |
| B 235 kJ | D 1 405 kJ |

- 32 Diagram 13 shows a cause of pollution in area.
Rajah 13 menunjukkan satu pencemaran di suatu kawasan.

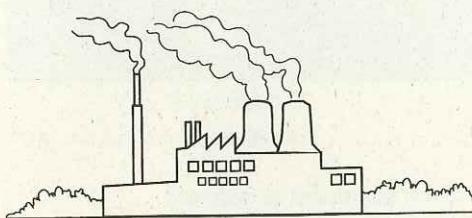


Diagram 13
Rajah 13

What is the effect of the pollution to the residents nearby?

Apakah kesan daripada pencemaran tersebut kepada penduduk berhampiran?

- A Diarrhoea
Cirit-birit
- B Bronchitis
Bronkitis
- C Haemophilia
Hemofilia
- D Skin cancer
Kanser kulit

- 33 Which of the following is an example of natural disaster?

Antara yang berikut, yang manakah satu contoh bencana alam?

- A Forest fire
Kebakaran hutan
- B Flash flood
Banjir kilat
- C Earthquake
Gempa bumi
- D Landslide
Tanah runtuh

- 34 What problem will arise if excess fertiliser is flowed into a river?

Apakah masalah yang akan timbul jika bahan berlebihan dialirkan ke dalam sungai?

- A Temperature of river increases
Suhu air sungai meningkat
- B Algae growth increases
Pertumbuhan alga meningkat
- C River will become shallow
Sungai menjadi cetek
- D Oxygen content increases
Kandungan oksigen meningkat

- 35 Authorities has banned the opening of land which exceed an altitude of 1 000m above sea level and the steepness more than 40 degrees.

What is the main purpose of this regulation?

Pihak berkuasa telah mengharamkan pembukaan tanah yang melebihi ketinggian 1 000 m dari aras laut dan kecuraman melebihi 40 darjah.

Apakah tujuan utama penetapan ini dibuat?

- A Decrease the amount of carbon dioxide gas released
Mengurangkan jumlah pembebasan gas karbon dioksida
- B Increase the growth of flora and fauna
Meningkatkan pertumbuhan flora dan fauna
- C Decrease the soil erosion
Mengurangkan hakisan tanah
- D Increase the soil fertility
Meningkatkan kesuburan tanah

- 36 A rubber tapper found that his latex coagulated before reaching the collection centre.

What is the method to overcome his problem?

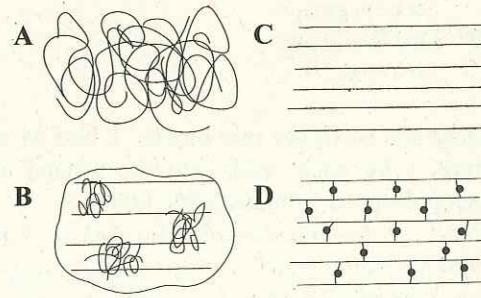
Seorang penoreh getah mendapati lateksnya telah mengumpal sebelum sampai ke pusat pengumpulan.

Apakah kaedah bagi mengatasi masalahnya?

- A Adding acid into the latex
Menambahkan asid ke dalam lateks
- B Adding water into the latex
Menambahkan air ke dalam lateks
- C Adding ammonia solution into the latex
Menambahkan larutan ammonia ke dalam lateks
- D Put latex into a covered container
Letakkan lateks ke dalam bekas tertutup

- 37 Which diagram represents a vulcanised rubber?

Rajah manakah yang mewakili getah tervulkan?



38 The following word equation represents the process of making soap.

Persamaan perkataan berikut mewakili proses pembuatan sabun.



What is P?

Apakah P?

- A Hydrochloric acid
Asid hidroklorik
- B Sodium hydroxide
Natrium hidrosida
- C Hydrogen peroxide
Hidrogen peroksida
- D Hydrogen carbonate
Hidrogen karbonat

39 Which of the following is an example of unsaturated fat?

Antara yang berikut, yang manakah merupakan contoh lemak tak tepu?

- A Meat
Daging
- C Olive oil
Minyak zaitun
- B Butter
Mentega
- D Goat milk
Susu kambing

40 A colourless liquid spilled on the hand of a student. He felt cold on that area and the liquid instantly dried.

What is the liquid?

Sejenis cecair tak berwarna telah tumpah ke atas tangan seorang pelajar. Dia berasa sejuk pada kawasan tersebut dan cecair itu kering dengan cepat.

Apakah cecair tersebut?

- A Ethanol
Etanol
- B Vinegar
Cuka
- C Salt solution
Larutan garam
- D Distilled water
Air suling

41 Diagram 14 shows two blocks, L and M with mass 1 kg each, sank into the ground after being dropped from the same height.

Rajah 14 menunjukkan dua bongkah, L dan M masing-masing berjisim 1 kg terbenam di dalam tanah setelah dijatuhkan dari ketinggian yang sama.

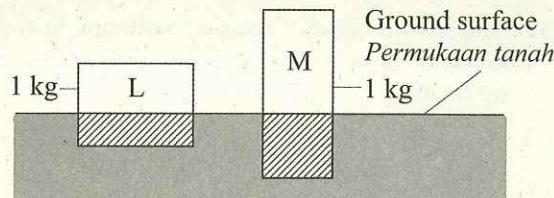


Diagram 14

Rajah 14

Which statement is correct?

Penyataan manakah yang benar?

- A Block M is heavier
Bongkah M lebih berat
- B Block M is denser
Bongkah M lebih tumpat
- C The pressure of block M is greater
Tekanan bongkah M lebih besar
- D The momentum of block M is greater
Momentum bongkah M lebih besar

42 Diagram 15 shows the odometer readings for a journey of a car from Johor Bahru to Seremban.

The time taken for the journey is three hours.

Rajah 15 menunjukkan bacaan odometer sebuah kereta yang bergerak dari Johor Bahru ke Seremban. Masa yang diambil bagi perjalanan tersebut adalah tiga jam.

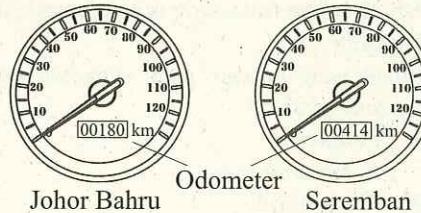


Diagram 15

Rajah 15

What is the average speed of the car for the journey?

$$\left[\text{Speed} = \frac{\text{Distance}}{\text{Time}} \right]$$

Berapakah purata laju kereta itu bagi perjalanan tersebut?

$$\left[\text{Laju} = \frac{\text{Jarak}}{\text{Masa}} \right]$$

- A 60 km h^{-1}
 60 km j^{-1}
- C 99 km h^{-1}
 99 km j^{-1}
- B 78 km h^{-1}
 78 km j^{-1}
- D 138 km h^{-1}
 138 km j^{-1}

- 43 Information below shows processes in one of the stages in the operation of a four stroke petrol engine.

Maklumat di bawah menunjukkan proses-proses dalam salah satu peringkat dalam operasi sebuah enjin petrol empat lejang.

- Both inlet valve and exhaust valve close
Kedua-dua injap masuk dan injap ekzos tertutup
- Spark plug produces electric spark
Palam pencucuh mengeluarkan bunga api elektrik
- Mixture of air and petrol burnt
Campuran udara dan petrol terbakar
- Piston moves downward
Omboh bergerak ke bawah

Based on the above information, what is the stage?

Berdasarkan maklumat di atas, apakah peringkat tersebut?

- A Intake stroke
Lejang aruhan
- B Compression stroke
Lejang mampatan
- C Power stroke
Lejang kuasa
- D Exhaust stroke
Lejang ekzos

- 44 A trolley with a mass of 0.5 kg is moving at a velocity of 2 m s^{-1} .

What is the momentum of the trolley?

[Momentum = Mass \times Velocity]

Sebuah troli berjisim 0.5 kg sedang bergerak dengan halaju 2 m s^{-1} .

Berapakah momentum troli itu?

[Momentum = Jisim \times Halaju]

- A 0.25 kg m s^{-1}
- B 1.00 kg m s^{-1}
- C 1.50 kg m s^{-1}
- D 2.50 kg m s^{-1}

- 45 Diagram 16 shows a type of an agricultural method.

Rajah 16 menunjukkan sejenis kaedah pertanian.

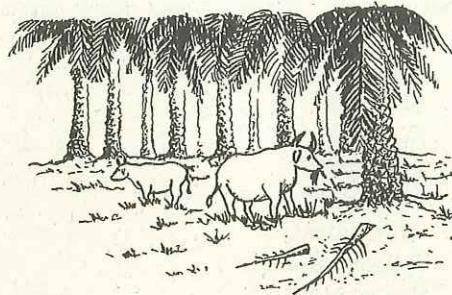


Diagram 16
Rajah 16

What is the method?

Apakah kaedah tersebut?

- A Mixed crop
Tanaman campuran
- B Crop rotation
Tanaman bergilir
- C Shifting farming system
Sistem pertanian pindah
- D Integrated farming system
Sistem pertanian bersepadu

- 46 Which of the following are the characteristics of genetically engineered tomato?

Antara yang berikut, yang manakah ciri-ciri tomat yang dihasilkan secara kejuruteraan genetik?

- I High resistance against pests
Rintangan tinggi terhadap haiwan perosak
 - II Resistant to environmental stresses
Tahan terhadap tekanan alam sekitar
 - III Contains all the genes that have been genetically modified
Mengandungi semua gen yang telah diubahsuai secara genetik
- A I and II
I dan II
 - B I and III
I dan III
 - C II and III
II dan III
 - D I, II and III
I, II dan III

- 47 What is the type of chemical used in food processing to prevent the growth of microorganism?

Apakah jenis bahan kimia yang digunakan dalam pemprosesan makanan untuk mencegah pertumbuhan mikroorganisma?

- A Stabilizer
Penstabil
- B Emulsifier
Pengemulsi
- C Antioxidant
Pengantioksida
- D Preservative
Bahan awet

- 48 Diagram 17 shows a food processing method.
Rajah 17 menunjukkan satu kaedah pemprosesan makanan.

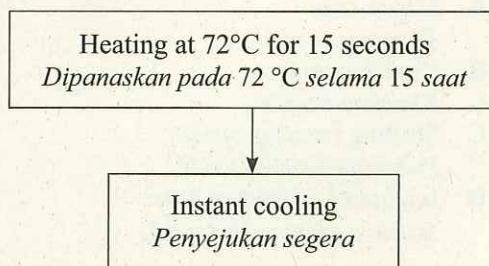


Diagram 17
Rajah 17

What is the method?

Apakah kaedah tersebut?

- A Vacuum packaging
Pembungkusan vakum
- B Pasteurization
Pempasteuran
- C Dehydration
Pendehidratan
- D Freezing
Penyejukbekuan

- 49 A wave with frequency 300 Hz has the wavelength of 10 m.
What is the velocity of the wave?
[Velocity = Frequency × Wavelength]

Satu gelombang dengan frekuensi 300 Hz mempunyai panjang gelombang 10 m. Berapakah halaju bagi gelombang itu?

- [$\text{Halaju} = \text{Frekuensi} \times \text{Panjang gelombang}$]
- A 30 m s^{-1}
 - B 290 m s^{-1}
 - C 310 m s^{-1}
 - D 3000 m s^{-1}

- 50 Diagram 18 shows a graph of displacement against distance of a wave.

Rajah 18 menunjukkan graf sesaran melawan jarak bagi suatu gelombang.

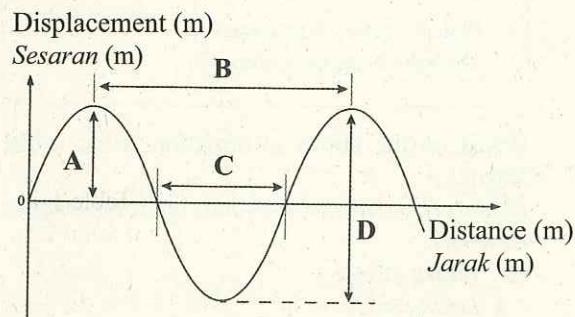


Diagram 18
Rajah 18

Which of the following A, B, C or D represents the amplitude of the wave?

Antara A, B, C dan D yang manakah mewakili amplitud bagi gelombang itu?

**END OF QUESTION PAPER
KERTAS PEPERIKSAAN TAMAT**