

1. Apakah yang membina dinding sel tumbuhan ?

What is plant cell wall made of?

A Fosfolipid

Phospholipid

B Glikoprotein

Glycoprotein

C Kolesterol

Cholesterol

D Selulosa

Cellulose

2. Apabila keadaan sesuai dan mempunyai makanan yang cukup, *Amoeba sp.* dan *Paramecium sp.* akan membiak melalui pembiakan aseks.

Namakan pembiakan aseks tersebut.

When the conditions are suitable and there is plenty of food, Amoeba sp. and Paramecium sp. will reproduce via asexual reproduction.

Name the axesual reproduction.

A Pertunasan

Budding

B Belahan dedua

Binary fission

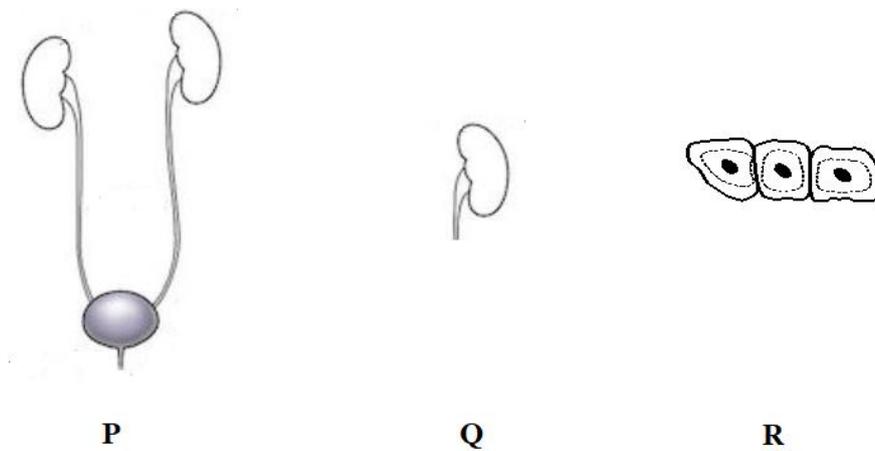
C Penjanaan semula

Regeneration

D Pembentukan spora

Spore formation

3. Rajah 1 menunjukkan pelbagai struktur P, Q dan R dalam organisasi sel.
Diagram 1 shows the different structures P, Q and R in a cell organisation.

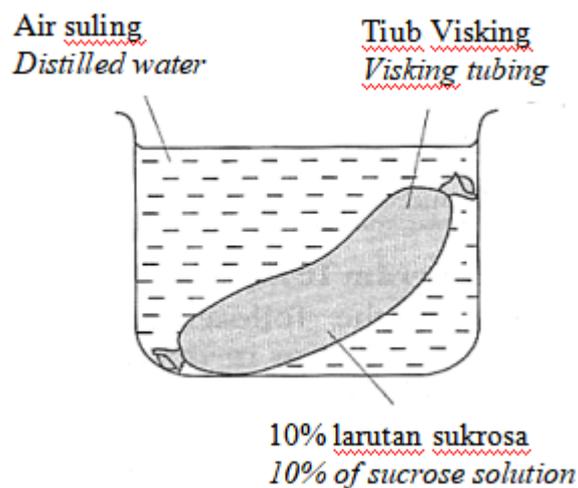


Rajah 1
Diagram 1

Yang manakah antara berikut adalah aras organisasi sel yang betul?

Which of the following is the correct level of cell organisation?

- A P → Q → R
 - B Q → R → P
 - C R → P → Q
 - D R → Q → P
4. Rajah 2 menunjukkan susunan radas bagi satu eksperimen.
Diagram 2 shows the apparatus set up of an experiment.

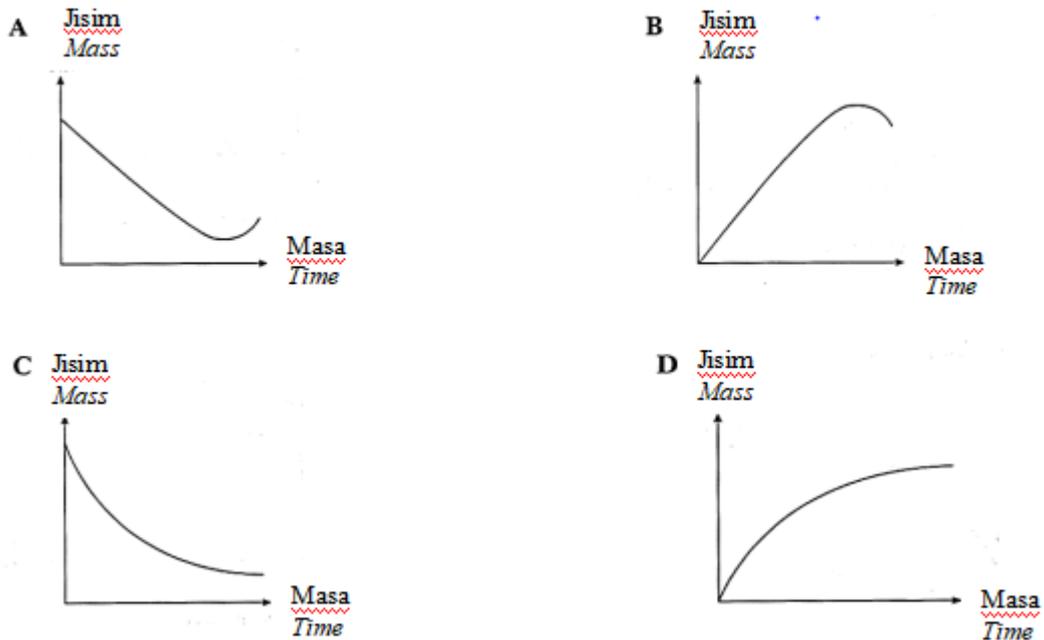


ajah 2

Diagram 2

Graf yang manakah mewakili perubahan jisim tiub Visking selepas 1 jam?

Which graph represents the changes in the mass of the Visking tubing after 1 hour?

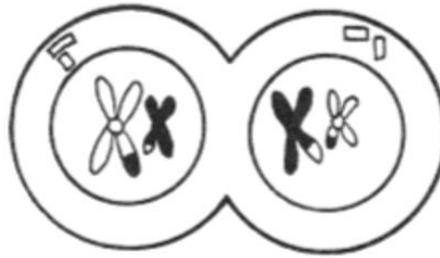


5. Dipeptida boleh diuraikan kepada asid amino melalui
A dipeptide can be broken down into amino acids through
- A hidrolisis
hydrolysis
 - B kondensasi
condensation
 - C pempolimeran
polymerization

6. Rajah 3 menunjukkan fasa **M** dalam pembahagian sel.

Diagram 3 shows M phase in cell division.

7.



Fasa M
Mphase

Rajah 3
Diagram 3

Apakah fasa sebelum fasa **M** ?

What is the phase before M phase?

A Anafasa I

Anaphase I

B Telofasa I

Telophase I

C Profasa II

Prophase II

D Telofasa II

Telophase II

7. The following information shows the characteristics of a child with a genetic disorder.

Maklumat berikut menunjukkan ciri-ciri seorang kanak-kanak yang mengalami kecacatan genetik.

- Mata sepet / *Slanted eyes*
- Lidah terjelir / *Protruding tongue*
- Terencat akal / *Mentally retarded*
- Anggota badan memendek/ *Shortened limbs*

What is the cause of this genetic disorder?

Apakah punca kecacatan genetik ini?

A Synapsis did not occur during prophase I

Sinapsis tidak berlaku semasa profasa I

B Cytokinesis did not occur during telophase II

Sitokinesis tidak berlaku semasa telofasa II

C Nuclear membrane did not form during telophase II

Membran nukleus tidak terbentuk semasa telofasa II

D Sister chromatid did not separate during anaphase II

Kromatid kembar tidak terpisah semasa anafasa II

8. Apakah substrat utama bagi respirasi sel?

What is the main substrate of cellular respiration?

A Fruktosa

Fructose

B Glukosa

Glucose

C Galaktosa

Galactose

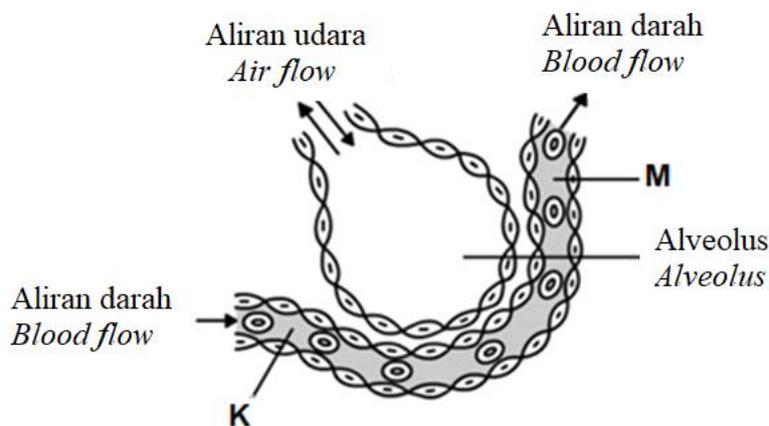
D Sukrosa

Sucrose

9. Apakah yang akan berlaku kepada pernafasan kita jika alveolus telah rosak dan kurang berfungsi?

What would happen to our breathing if the alveoli were damaged and poorly functioning?

- A Kerap bersin
Sneeze often
- B Tercungap-cungap
Gaspng
- C Batuk berterusan
Persistent cough
- D Sukar menelan
Difficult to swallow
10. Rajah 4 menunjukkan pengangkutan gas-gas respirasi dari alveolus ke kapilari darah.
Diagram 4 shows the transport of respiratory gases from the alveolus to blood capillary.



Rajah 4
Diagram 4

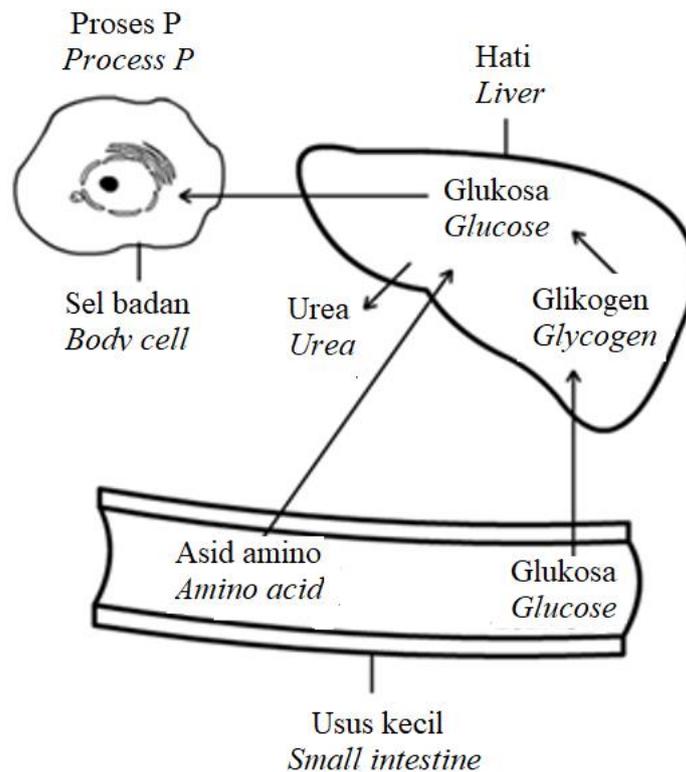
Apakah tekanan separa gas oksigen dan gas karbon dioksida di K dan M ?

What are the partial pressure of the oxygen gas and carbon dioxide gas at K and M ?

	K	M
A	Tekanan separa oksigen tinggi <i>Partial pressure of oxygen is high</i>	Tekanan separa karbon dioksida rendah <i>Partial pressure of carbon dioxide is low</i>
B	Tekanan separa karbon dioksida tinggi <i>Partial pressure of carbon dioxide is high</i>	Tekanan separa oksigen tinggi <i>Partial pressure of oxygen is high</i>
C	Tekanan separa karbon dioksida rendah <i>Partial pressure of carbon dioxide is low</i>	Tekanan separa oksigen rendah <i>Partial pressure of oxygen is low</i>
D	Tekanan separa oksigen rendah <i>Partial pressure of oxygen is low</i>	Tekanan separa karbon dioksida tinggi <i>Partial pressure of carbon dioxide is high</i>

11. Rajah 5 menunjukkan laluan nutrien ke sel badan.

Diagram 5 shows the pathway of nutrients to body cell.



Rajah 5
Diagram 5

Proses P ialah

Process P is

A asimilasi

assimilation

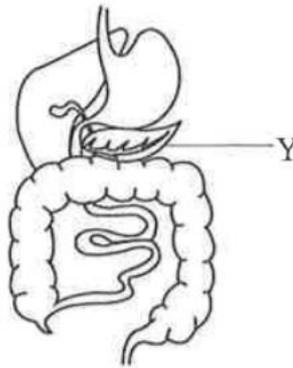
B detoksifikasi

detoxification

C pendeaminaan

deamination

12. Rajah 6 menunjukkan organ Y dalam sistem pencernaan manusia.
Diagram 6 shows organ Y in the human digestive system.



Rajah 6
Diagram 6

Jika organ Y rosak, seseorang individu akan menghadapi masalah dalam pencernaan

If the organ Y is damaged, an individual will have problems in digesting

A kanji dan lipid

starch and lipids

B kanji dan protein

starch and proteins

C lipid dan protein

lipids and proteins

D kanji, lipid dan protein

starch, lipids and proteins

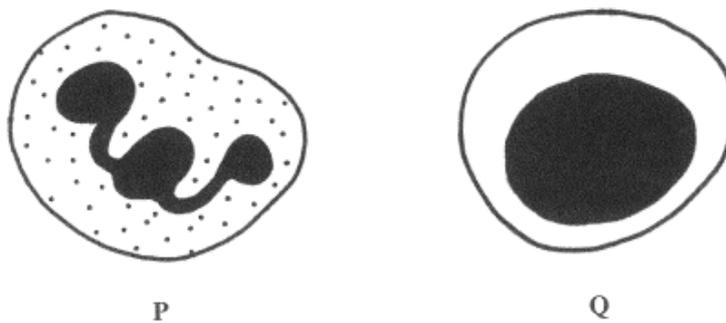
13. Seorang pesakit telah menjalani pembedahan membuang pundi hempedu. Antara menu berikut, yang manakah paling sesuai bagi pesakit tersebut?

A patient has undergone bile removal surgery. Which of the following menus is most suitable for the patient?

- A Susu segar, mi udang, ayam goreng
Fresh milk, shrimp noodles, fried chicken
- B Nasi goreng, kek mentega, buah-buahan
Fried rice, butter cake, fruits
- C Kentang goreng, sayur goreng, pisang goreng
French fries, fried vegetables, banana fritters
- D Ayam kukus, salad segar, roti gandum penuh dengan jem
Steamed chicken, fresh salad, wholemeal bread with jam

14. Rajah 7 menunjukkan dua jenis sel darah

Diagram 7 shows two types of blood cells.



Rajah 7

Diagram 7

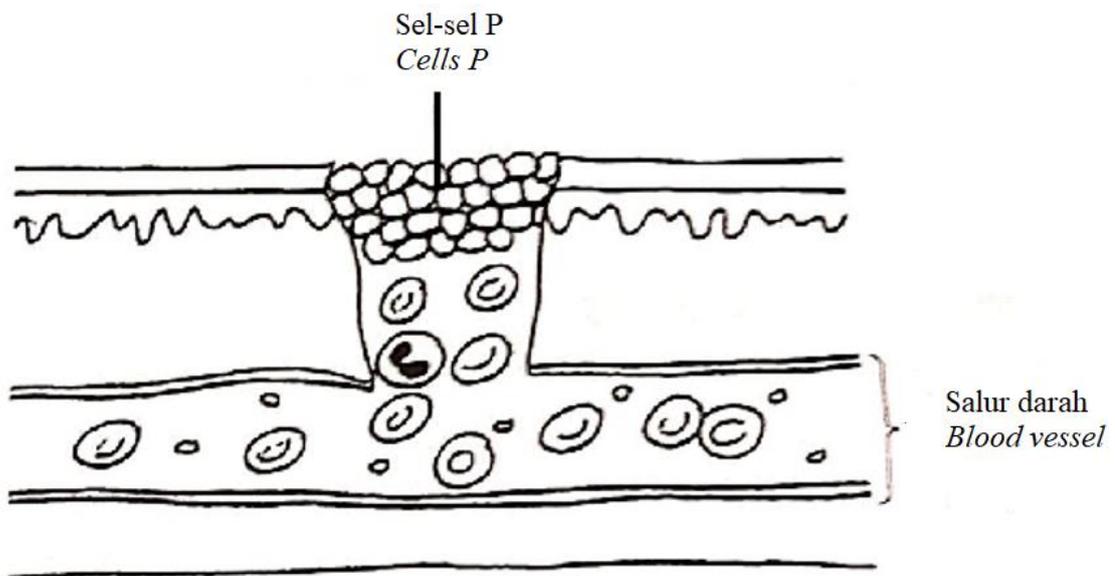
Apakah sel P dan Q ?

What are cell P and Q ?

	P	Q
A	Neutrofil <i>Neutrophil</i>	Limfosit <i>Lymphocyte</i>
B	Eosinofil <i>Eosinophil</i>	Eritrosit <i>Erythrocyte</i>
C	Basofil <i>Basophil</i>	Neutrofil <i>Neutrophil</i>
D	Limfosit <i>Lymphocyte</i>	Eritrosit <i>Erythrocyte</i>

15. Rajah 8 menunjukkan luka yang menyebabkan salur darah terpotong. Sel-sel P bergumpal dan membebaskan bahan kimia

Diagram 8 shows a wound that causes a cut in blood vessel. Cell P clump together and release chemicals.



Rajah 8
Diagram 8

Apakah sel-sel P ?

What are cell P?

A Fibrin

Fibrin

B Platlet

Platelets

C Sel darah merah

Red blood cell

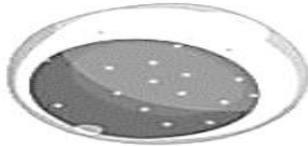
D Sel darah putih

White blood cell

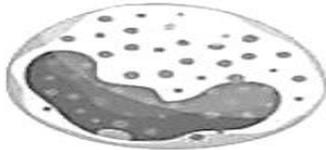
16. Antara sel darah berikut, yang manakah terlibat dalam barisan pertahanan kedua?

Which of the following blood cells involved in the second line of defence?

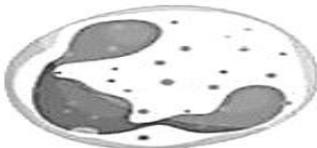
A



B



C



D



17.

Difteria adalah jangkitan biasa tetapi serius yang disebabkan oleh strain bakteria yang disebut *Corynebacterium diphtheriae* yang membuat toksin (racun). Toksin menyukarkan kanak-kanak bernafas dan menelan, tetapi juga menyerang jantung, ginjal dan saraf. Vaksinasi untuk difteria adalah kaedah terbaik untuk mencegah difteria

Diphtheria is an uncommon but serious infection caused by strains of a bacteria called Corynebacterium diphtheriae that make toxin (poison). The toxin makes it difficult for children to breathe and swallow, but it also attacks the heart, kidneys and nerves. Vaccination for diphtheria is the best way to prevent diphtheria.

Seorang remaja lelaki yang pernah dijangkiti difteria baru sahaja menjalani Ujian Darah Diphtheria Titer untuk memastikan adakah dia kebal terhadap Difteria. Hasil ujiannya menunjukkan bahawa dia kebal terhadap difteria dan tidak memerlukan vaksinasi difteria. Dia kebal terhadap difteria kerana tubuhnya mempunyai

A teenage boy has diphtheria before just undergone his Diphtheria Titer Blood Test to confirm if he is immune to diphtheria. His test's result show that he is immune to diphtheria and does not a diphtheria vaccination. He is immune to diphtheria because his body has

- A antibiotik untuk memusnahkan bakteria *Corynebacterium diphtheriae*
antibiotics to destroy the Corynebacterium diphtheriae bacteria
- B antigen yang menyerang bakteria *Corynebacterium diphtheriae*
the antigens that attack the Corynebacterium diphtheriae bacteria
- C antiserum untuk melawan bakteria *Corynebacterium diphtheriae*
an antiserum to fight the Corynebacterium diphtheriae bacteria
- D limfosit yang menghasilkan antibodi untuk memusnahkan bakteria *Corynebacterium diphtheriae*
lymphocytes that produce antibodies to destroy the Corynebacterium diphtheriae bacteria

18. Antara neuron berikut, yang manakah menghantar impuls saraf daripada neuron deria ke neuron motor?

Which of the following neurone transmit nerve impulses from the sensory neurone to the motor neurone?

- A Neuron motor
Motor neurone
- B Neuron deria
Sensory neurone
- C Neuron perantaraan
Relay neurone

19. Seorang lelaki mengalami rembesan hormon **X** yang berlebihan menyebabkan paras glukosa darahnya terlalu rendah. Antara simptomnya ialah keletihan, sukar tidur malam, tidak dapat berfikir dengan baik, ketakutan, ketidakstabilan emosi, mudah pitam dan sakit kepala.

Apakah hormon **X** ?

*A man experience an excessive secretion of **X** hormones causes his blood glucose level is too low. Among the symptoms are fatigue, difficulties sleeping at night, disordered thoughts, fear, emotional instability, faints easily and headache.*

*What is **X** hormones?*

- A Insulin
Insulin
- B Glukagon
Glucagon
- C Tiroksina
Thyroxine
- D Antidiuretik
Antidiuretic

20. Seorang murid berlari dalam perlumbaan 100 meter. Selepas tamat perlumbaan, dia berehat selama 30 minit dan kemudian memasuki kompleks sukan yang berhawa dingin. Apakah yang berlaku kepada kelenjar peluh dan kapilari darah murid tersebut selepas 30 minit?

A student runs in a 100 metre race. After the race, he rested for 30 minutes and later entered an air-conditioned sport complex.

What happens to his sweat glands and blood capillaries after 30 minutes?

	Kelenjar peluh <i>Sweat glands</i>	Kapilari darah <i>Blood capillaries</i>
A	Kurang aktif <i>Less active</i>	Pemvasodilatan <i>Vasodilation</i>
B	Kurang aktif <i>Less active</i>	Pemvasocerutan <i>Vasoconstriction</i>
C	Lebih aktif <i>More active</i>	Pemvasodilatan <i>Vasodilation</i>
D	Lebih aktif <i>More active</i>	Pemvasocerutan <i>Vasoconstriction</i>

21. Maklumat yang diberi di bawah adalah berkaitan dengan sejenis penyakit otot rangka.
The information given below is related to a type of musculoskeletal disease.

- Tulang menjadi porous dan jisim berkurang
Bones become porous and decrease in mass.
- Tulang menjadi rapuh dan mudah patah
Bones become brittle and fragile
- Disebabkan kadar penyerapan kalsium yang rendah
Caused by low absorption of calcium
- Biasanya berlaku pada orang tua
Usually occur during old age

Berdasarkan maklumat di atas, apakah penyakit itu?

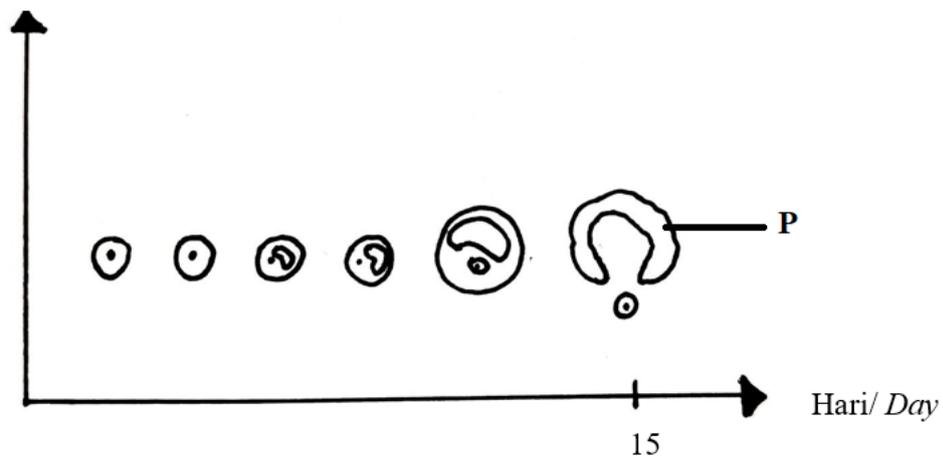
Based on the information above, what is the disease?

- A Arthritis
Arthritis
- B Rikets
Rickets
- C Skoliosis
Scoliosis
- D Osteoporosis
Osteoporosis

22. Rajah 9 menunjukkan perkembangan folikel dari hari 1 hingga hari ke 15.

Diagram 9 shows the follicle development from day 1 to day 15.

Perkembangan folikel
Follicle development



Rajah 9

Diagram 9

Apakah yang akan berlaku pada struktur **P** pada selepas hari ke 15?

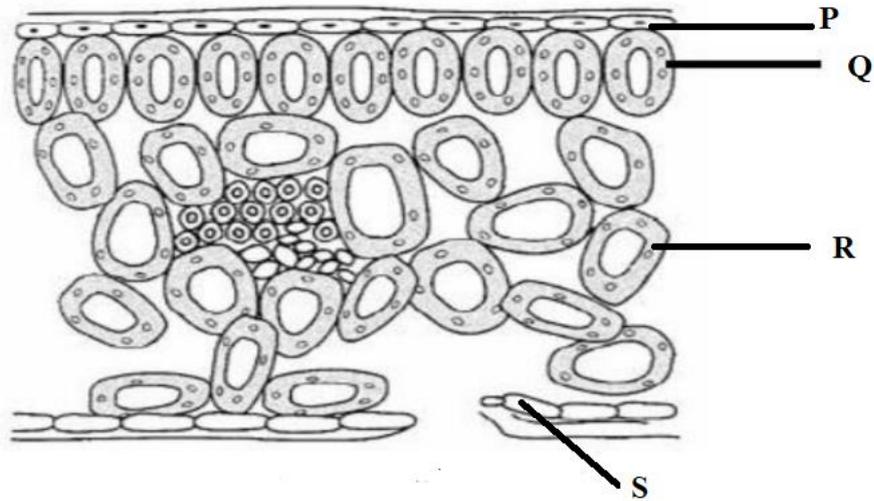
*What would happen to structure **P** after day 15?*

- A Membentuk satu ovum
Form an ovum
- B Akan dimusnahkan sepenuhnya

- Will be fully degenerating*
- C Berkembang menjadi korpus luteum
Develop into a corpus luteum
- D Merembeskan hormone peluitenan
Secret luteinising hormone
23. Sepasang suami isteri yang tidak mempunyai anak meminta nasihat doktor berkaitan masalah kesuburan mereka. Doktor memberi diagnosis bahawa si isteri menghadapi masalah perkembangan sel folikel. Antara berikut, rawatan manakah yang boleh mengatasi masalah tersebut?
- A childless couple consulted a doctor about their infertility problem. The doctor gave a diagnosis that the wife had a problem of follicle cell development. Which of the following treatments can overcome the problem?*
- A Merawat dengan hormon perangsang folikel (FSH)
Treat with follicle stimulating hormone (FSH)
- B Merawat dengan progesteron
Treat with progesterone
- C Merawat dengan oestrogen
Treat with oestrogen
- D Merawat dengan hormon peluteinan (LH)
Treat with luteinising hormone (LH)
24. Antara berikut, tisu yang manakah terlibat dalam fotosintesis?
- Which of the following tissues involved in photosynthesis?*
- A Tisu epidermis
Epidermis tissue
- B Tisu parenkima
Parenchyma tissue
- C Tisu sklerenkima
Sclerenchyma tissue
- D Tisu kolenkima
Colenchyme tissue

25. Rajah 10 menunjukkan keratan membujur bagi sehelai daun hijau.

Diagram 10 shows a longitudinal section of a green leaf.



Rajah 10
Diagram 10

Sel manakah yang mengandungi ketumpatan kloroplas yang tinggi?

Which cells contain a high density of chloroplast?

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

26. Apakah itu guttasi?

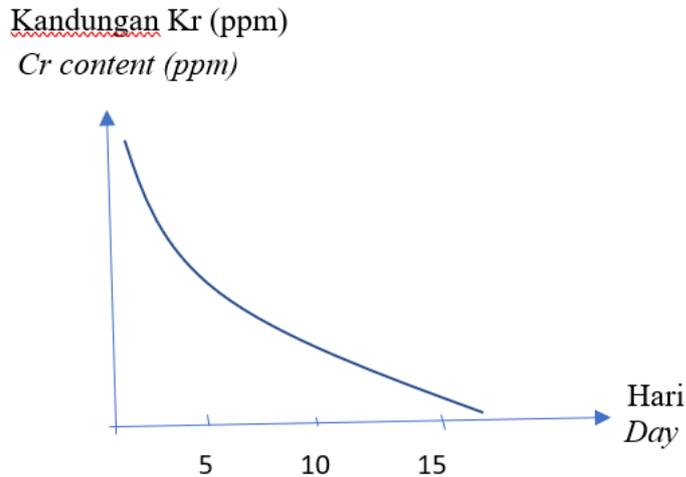
What is guttation?

- A Apabila tumbuhan mati akibat air yang berlebihan di dalam tisu
When a plant dies due to excessive water in its tissue
- B Apabila tumbuhan layu akibat kekurangan air di dalam tisu
When a plant wilts due to lack of water in its tissue

- C Apabila tumbuhan mengeluarkan air berlebihan secara titisan melalui liang khas pada hujung daun
When a plant excretes excessive water in droplets through the special pores at the edges of leaves
- D Apabila tumbuhan melakukan transpirasi dengan menyingkirkan wap dan titisan air
When a plant carries out transpiration by discharging both water vapours and droplets

27. Satu gelang kulit kayu dikeluarkan daripada batang pokok. Pokok itu mati selepas beberapa bulan. Pernyataan manakah yang menerangkan situasi ini?
A complete ring of bark is removed from the stem of a woody plant. The plant dies after a few months. Which statement explains the situation?
- A Gula tidak dapat diangkut ke akar.
Sugar cannot be transported to the roots
- B Gula meresap keluar daripada bahagian kulit batang yang digelang.
Sugar leaks from the ring of removed bark.
- C Daun tidak boleh menjalankan fotosintesis
The leaves cannot carry out photosynthesis.
- D Parasite menyerang batang pokok yang terdedah kepada atmosfera.
Parasites attack the stem due to the exposure to atmosphere.

28. Satu eksperimen dijalankan untuk menunjukkan fitoremediasi dengan menanam keladi bunting dalam air yang tercemar dengan kromium.
Rajah 11 menunjukkan keputusan yang diperoleh selepas dua minggu.
An experiment is carried out to demonstrate phytoremediation by growing water hyacinth in the chromium-contaminated water.
Diagram 11 shows the result obtained after two weeks.



Rajah 11
Diagram 11

Apakah kesimpulan yang dapat dibuat daripada eksperimen tersebut?

What conclusion can be drawn from the experiment?

- A Air itu subur untuk pertumbuhan tumbuhan
The water is fertile for plant growth
- B Keladi bunting dapat bertumbuh dengan subur dalam air yang tercemar dengan kromium
Water hyacinth can grow healthier in chromium-contaminated water
- C Sebatian kromium semakin berkurangan
The chromium compound is decreasing
- D Keadaan air selepas dua minggu sesuai untuk ikan hidup
Water condition after two weeks is ideal for fish to live

29. Seorang petani ingin merangsang pertumbuhan akar adventatif daripada keratan batang. Hormon yang manakah harus dia sapukan pada bahagian batang yang dipotong?

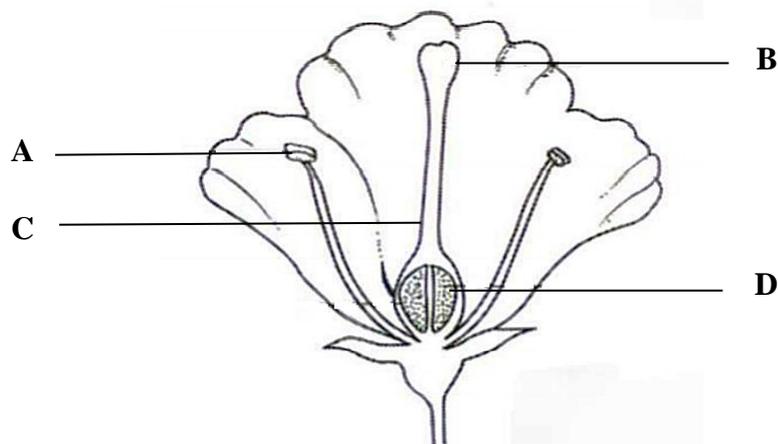
A farmer wants to stimulate the growth of adventitious roots from a stem cutting.

Which hormone should he apply to the part of the stem where the stem is cut?

- A Auksin
Auxin
- B Etilena
Ethylene
- C Sitokinin
Cytokinin

D Giberelin
Gibberellin

30. Rajah 12 menunjukkan keratan membujur bagi sekuntum bunga.
Diagram 12 shows a longitudinal section of a flower.



Rajah 12
Diagram 12

Antara bahagian **A**, **B**, **C** atau **D**, di manakah persenyawaan ganda dua berlaku?
*At which part **A**, **B**, **C** or **D** the double fertilisation take place?*

31. Tumbuhan xerofit tinggal di kawasan dengan bekalan air terhad seperti gurun.
Apakah adaptasi tumbuhan xerofit ?
Xerophytes live in the conditions with limited water supply such as the desert.
What is an adaptation of xerophytic plant ?

- A Ruang udara yang besar.
Large air spaces.
- B Bilangan stoma yang banyak.
A large number of stomata.
- C Daun diubah suai menjadi duri.
Leaves have modified into thorns.
- D Pertumbuhan akar sedikit.
Poor root growth.

32. Kumpulan individu manakah yang boleh membiak antara satu sama lain untuk menghasilkan individu baharu?

Which group of individuals can breed with each other to produce new offspring?

A Genus

A genus

B Filum

A phylum

C Order

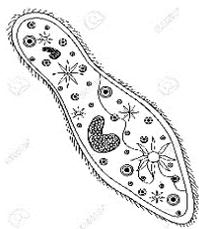
An order

D Spesies

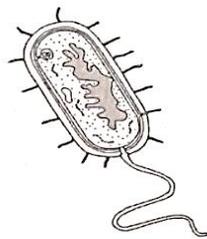
A species

33. Rajah 13 menunjukkan sejumlah organisma. Setiap organisma dikelaskan ke dalam suatu sistem pengelasan universal.

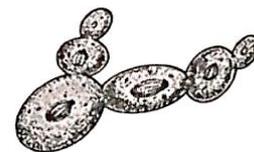
Diagram 13 shows a number of organisms. Each organism is classified into the universal system of classification.



Paramesium
Paramecium



Bakteria
Bacteria



Yis
Yeast

Rajah 13
Diagram 13

Antara pengelasan berikut, yang manakah adalah betul?

Which of the following classification is correct?

	Paramesium <i>Paramecium</i>	Bakteria <i>Bacteria</i>	Yis <i>Yeast</i>
A	Protista <i>Protista</i>	Eubacteria <i>Eubacteria</i>	Fungi <i>Fungi</i>
B	Protista <i>Protista</i>	Fungi <i>Fungi</i>	Eubacteria <i>Eubacteria</i>
C	Fungi <i>Fungi</i>	Protista <i>Protista</i>	Eubacteria <i>Eubacteria</i>
D	Eubacteria <i>Eubacteria</i>	Protista <i>Protista</i>	Fungi <i>Fungi</i>

34. Pernyataan manakah yang merujuk kepada komuniti?

Which statement refers to community?

A Satu kumpulan organisma yang mempunyai ciri-ciri yang sama dan boleh membiak antara satu sama lain

A group of organisms with similar characteristics and capable of interbreeding.

B Satu kumpulan organisma daripada spesies yang sama tinggal di habitat yang sama.

A group of organisms of the same species living in the same habitat.

C Beberapa spesies yang berlainan yang tinggal di habitat yang sama.

Several different species living in the same habitat.

D Beberapa organisma yang tinggal di tempat yang sama dan memainkan peranan yang sama.

Several organisms that occupy the same place and play the same role.

35. Jadual 1 menunjukkan keputusan kajian yang dijalankan oleh Encik A untuk menganggarkan saiz populasi siput babi di salah sebuah kebunnya.

Table 1 shows the results of a study conducted by Mr. A to estimate the population size of arden snails in one of his farms.

Tangkapan <i>Capture</i>	Bilangan siput babi yang ditangkap <i>Number of snails captured</i>	
	Bertanda <i>Marked</i>	Tidak bertanda <i>Unmarked</i>
Pertama / <i>First</i>	40	-
Kedua / <i>Second</i>	10	20

Jadual 1/ *Table 1*

Berapakah anggaran populasi siput babi di kebun tersebut?

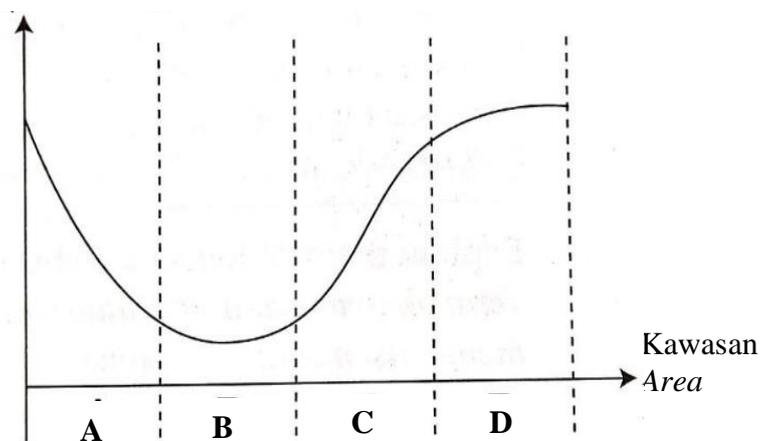
What is the estimated population of garden snails in the farm?

- A 100
- B 120
- C 200
- D 250

36. Rajah 14 menunjukkan graf kepekatan oksigen terlarut di kawasan berlainan **A**, **B**, **C** dan **D**, di sebatang sungai.

Diagram 14 shows the graph of concentration of dissolved oxygen in different areas, A, B, C and D, in a river.

Kepekatan oksigen terlarut
Concentration of dissolved oxygen



Rajah 14
Diagram 14

Antara kawasan **A**, **B**, **C** dan **D**, yang manakah mempunyai nilai keperluan oksigen biokimia (BOD) yang paling tinggi?

*Which area **A**, **B**, **C** or **D**, has the highest value of biochemical oxygen demand (BOD)?*

37. Apakah jenis gamet yang boleh dihasilkan oleh pokok kacang pea heterozigus ($RrYy$) untuk warna bunga dan kedudukan bunga?

What are the types of gametes that can be produced by a garden pea plant heterozygous ($RrYy$) for flower colour and flower position?

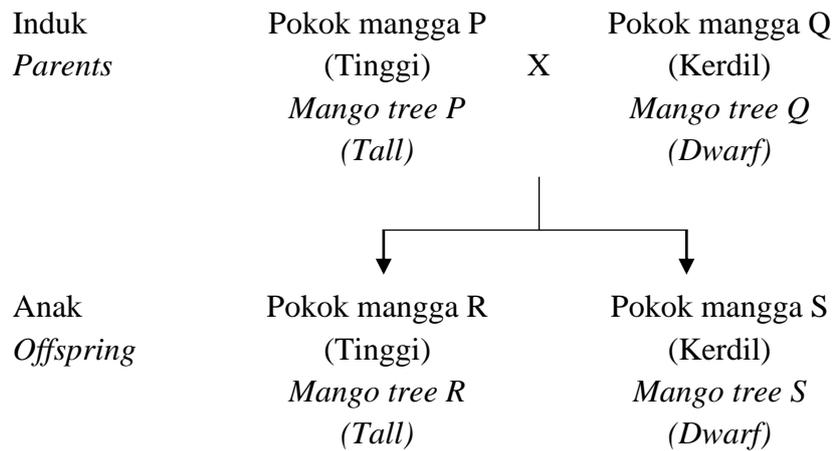
A RY dan ry
RY and ry

B Rr dan Yy
Rr and Yy

C RY, Ry, rY dan ry
RY, Ry, rY, and ry

D Rr, Yy, RY dan ry
Rr, Yy, RY, and ry

38. Rajah 15 menunjukkan kacukan monohibrid antara pokok mangga P dan pokok mangga Q. 50% daripada anaknya adalah tinggi dan 50% lagi adalah kerdil.
Diagram 15 shows a monohybrid cross between mango tree P and mango tree Q. 50% of the offspring are tall and 50% are dwarf.



Rajah 15
Diagram 15

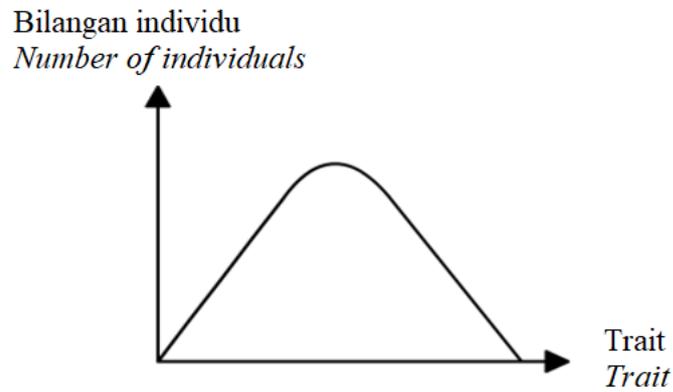
Jika pokok mangga R dikacukan dengan pokok mangga S, berapakah peratus pokok mangga yang dihasilkan adalah kerdil?

If mango tree R is crossed with mango tree S, what is the percentage of the tree produced will be dwarf?

- A 0%
- B 25%
- C 50%
- D 75%

39. Rajah 16 ialah satu graf yang menunjukkan taburan untuk trait dalam populasi manusia.

Diagram 16 is a graph which shows the distribution of a trait in human population.



Rajah 16
Diagram 16

Apakah trait yang diwakili oleh graf tersebut ?

What the trait represented by the graph ?

A		C	
B		D	

40. Antara organisma berikut, yang manakah menghasilkan insulin manusia melalui kejuruteraan genetik?

Which organisms can be used to produce human insulin through genetic engineering?

A Bakteria

Bacteria

B Virus

Viruses

C Fungi

Fungi

D Protozoa

Protozoa

Kertas soalan tamat

End of question paper