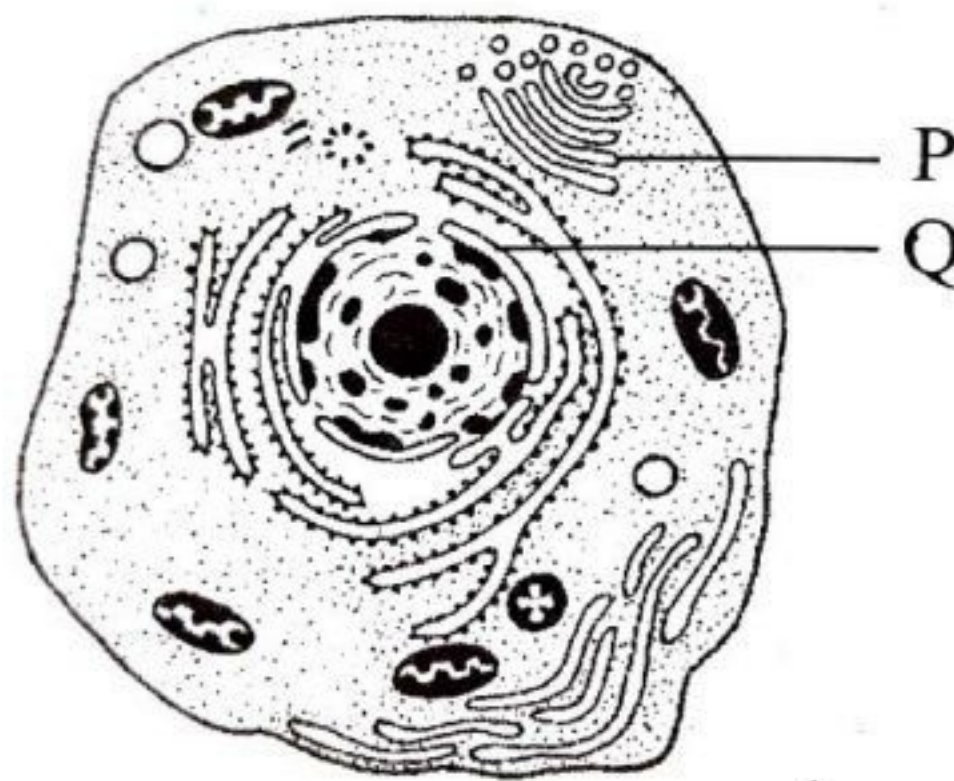


Kertas soalan ini mengandungi 40 soalan.
Jawab **semua** soalan.

1. Antara berikut, yang manakah **bukan** ciri-ciri lukisan biologi?
*Which of the following is **not** characteristics of biological drawing?*
- A Garis label mesti tertuju pada struktur dan mempunyai kepala anak panah
Label lines must be pointed to the correct structure and with an arrowhead
- B Garisan lukisan perlulah jelas, bersih dan berterusan dan tidak putus-putus
Lines drawn must be clear, clean and continuous
- C Besar dan tepat, menggunakan pensel yang tajam dari bukan pensel warna atau pen
Large and accurate, using a sharp pencil and not a colour pencil or pen
- D Tidak berlorek secara artistik
Not shaded artistically
2. Rajah 1 menunjukkan satu sel haiwan.
Diagram 1 shows an animal cell.

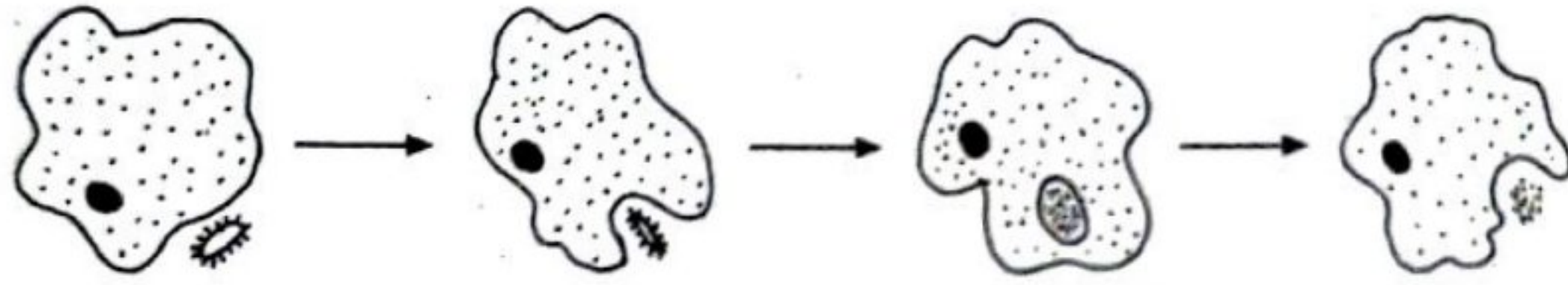


Rajah 1/ *Diagram 1*

Apakah P dan Q?
What are P and Q?

	P	Q
A	Jasad Golgi <i>Golgi apparatus</i>	Mitokondria <i>Mitochonrion</i>
B	Jasad Golgi <i>Golgi apparatus</i>	Nukleus <i>Nucleus</i>
C	Ribosom <i>Ribosome</i>	Nukleus <i>Nucleus</i>
D	Ribosom <i>Ribosome</i>	Mitokondria <i>Mitochonrion</i>

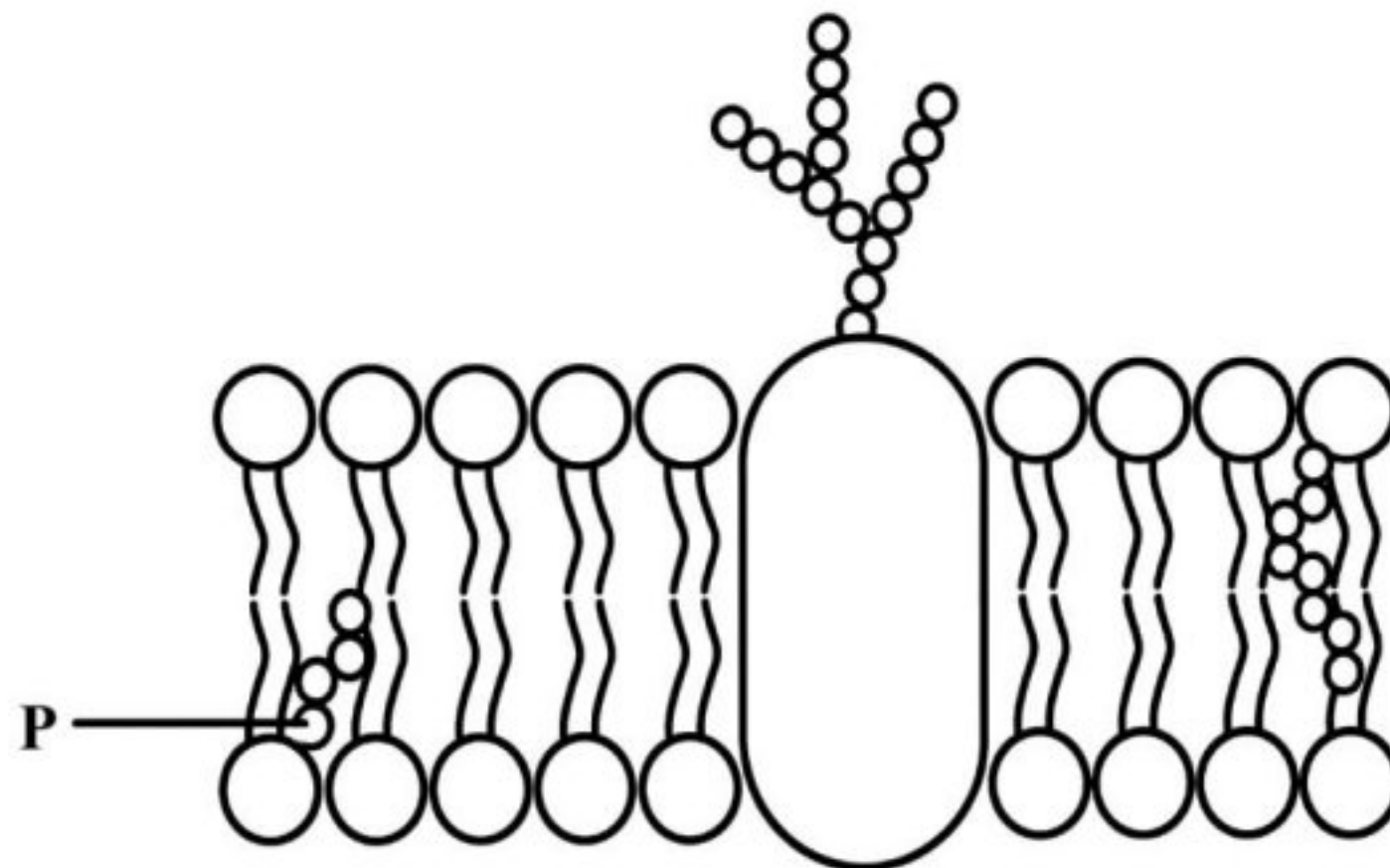
3. Rajah 2 menunjukkan suatu proses yang berlaku pada *Amoeba sp.*
Diagram 2 shows a process that occurs in Amoeba sp.



Rajah 2/ Diagram 2

Apakah komponen yang terlibat dalam proses ini?
What is the component involved in this process?

- A Mitokondria / *Mitochondrion*
 - B Ribosom / *Ribosome*
 - C Lisosom / *Lysosome*
 - D Nukleus / *Nucleus*
4. Rajah 3 menunjukkan struktur membran plasma.
Diagram 3 shows a structure of plasma membrane.

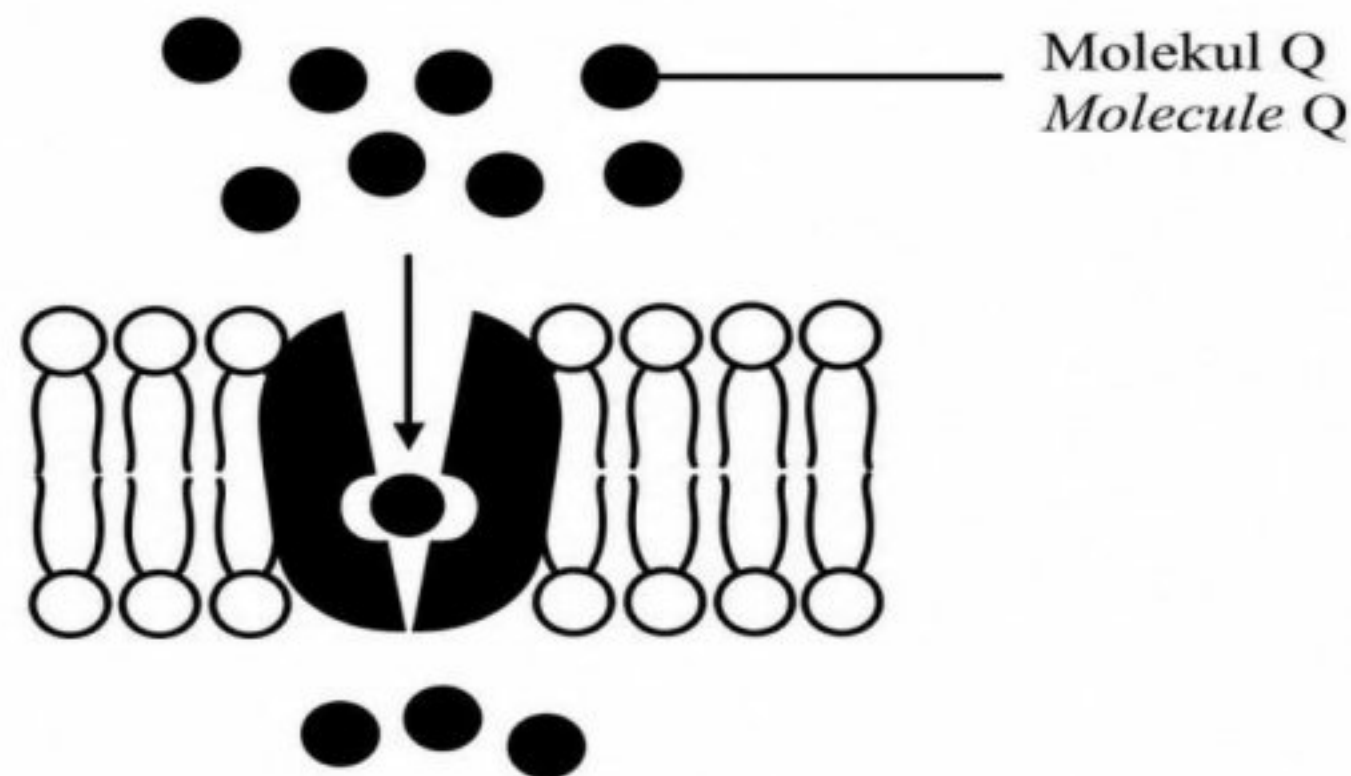


Rajah 3 / Diagram 3

Apakah fungsi P?
What is the function of P?

- A Menstabilkan membran
Stabilize the membrane
- B Menjadikan dwilapisan fosfolipid lebih fleksibel
Make the phospholipid bilayer more flexible
- C Menjadikan dwilapisan fosfolipid kurang fleksibel
Make the phospholipid bilayer less flexible
- D Bertindak sebagai molekul reseptor untuk hormon
Acts as a receptor to hormones

5. Rajah 4 menunjukkan sejenis pergerakan molekul Q merentasi membran plasma.
Diagram 4 shows a type of movement molecule Q across plasma membranes.



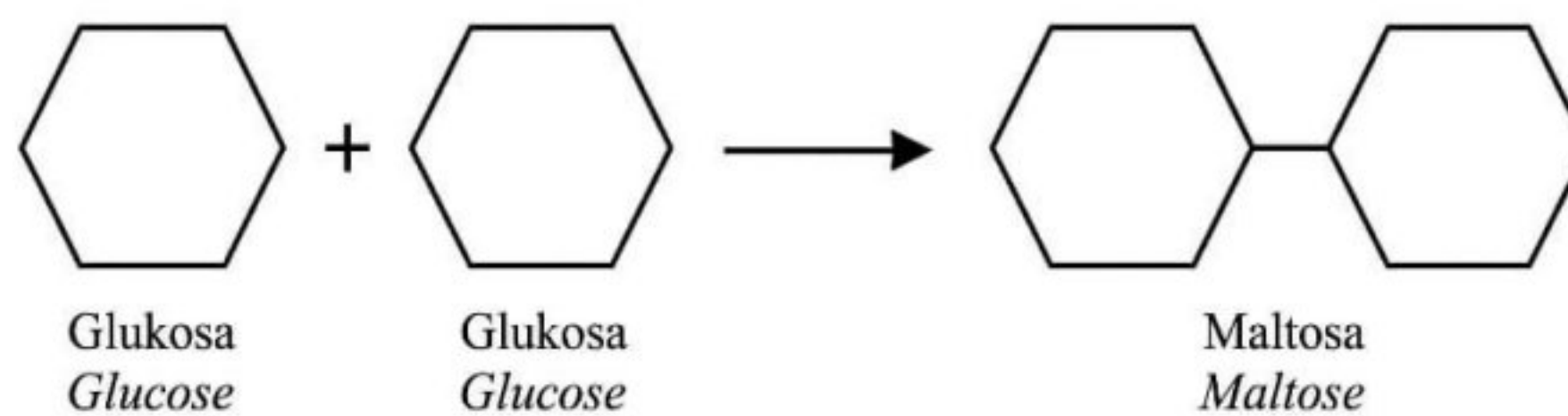
Rajah 4/ Diagram 4

Antara berikut yang manakah benar tentang pergerakan molekul Q tersebut?
Which of the following statements is correct about the movement of molecule Q?

- I Pergerakan molekul Q adalah secara resapan ringkas
Movement of molecule Q is by simple diffusion
- II Pergerakan molekul Q adalah secara resapan berbantu
Movement of molecule Q is by facilitated diffusion
- III Pergerakan molekul Q adalah menuruni kecerunan kepekatan
Movement of molecule Q is down the concentration gradient
- IV Pergerakan molekul Q memerlukan tenaga daripada molekul ATP
Movement of molecule Q requires energy from ATP molecules.

- A I dan II / *I and II*
- B I dan III / *I and III*
- C II dan III / *II and III*
- D III dan IV / *III and IV*

6. Rajah 5 menunjukkan satu tindak balas metabolisme.
Diagram 5 shows a metabolic reaction.



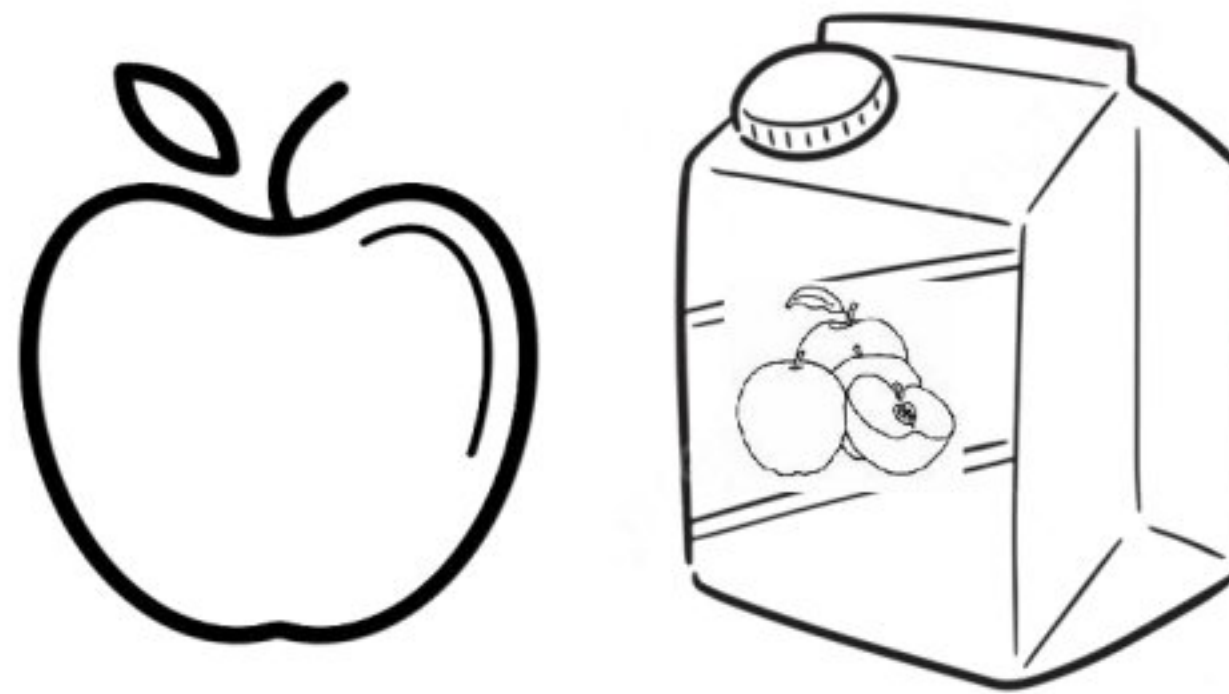
Rajah 5 / Diagram 5

Antara berikut, yang manakah menerangkan tindak balas tersebut?
Which of the following describes the reaction?

- I Tindak balas anabolisme
Anabolic reaction
- II Tindak balas katabolisme
Catabolic reaction
- III Membebaskan tenaga
Release energy
- IV Menyerap tenaga
Absorb energy

- A I dan II / *I and II*
- B I dan IV / *I and IV*
- C II dan III / *II and III*
- D III dan IV / *III and IV*

7. Rajah 6 menunjukkan minuman jus buah yang dikomersialkan.
Diagram 6 shows a commercialized fruit juice drink.



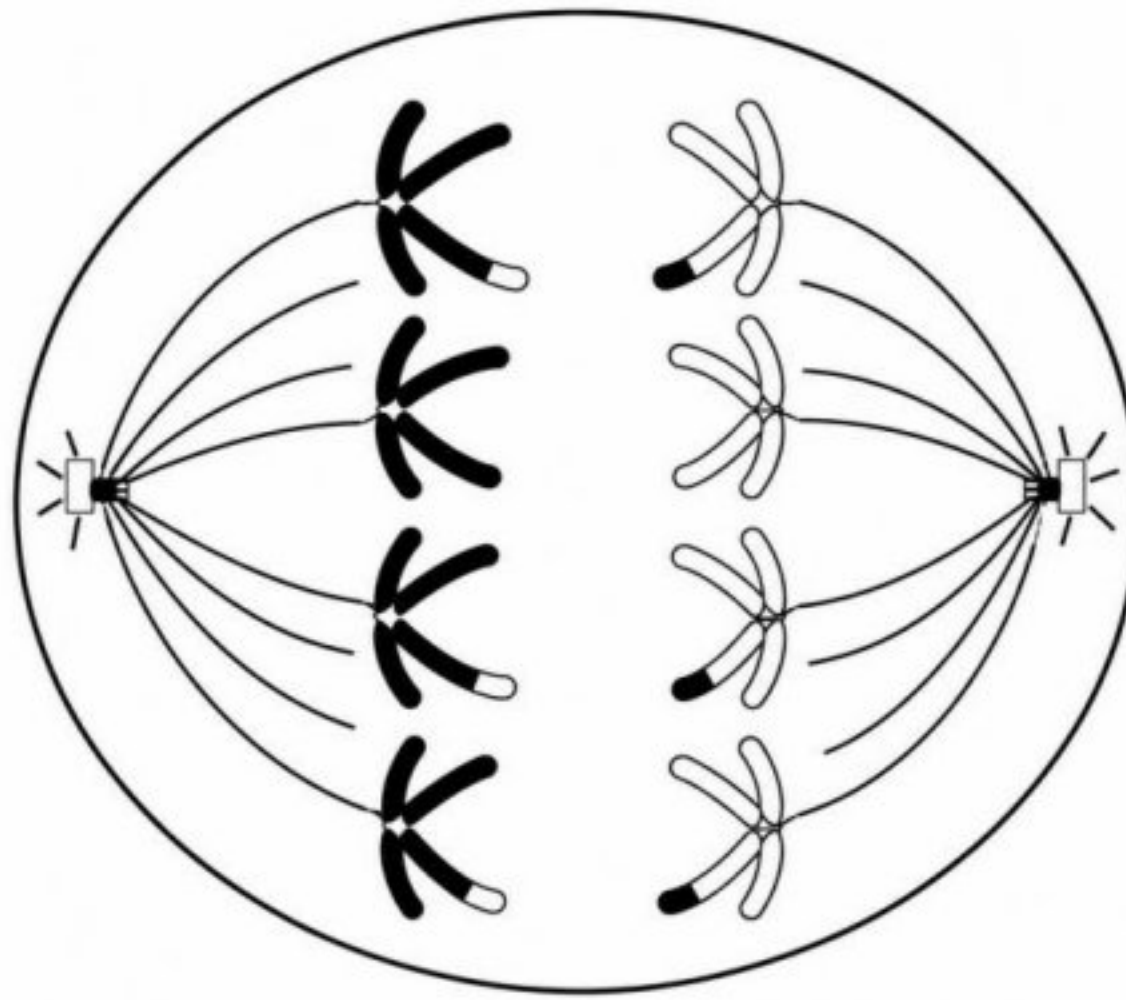
Rajah 6 / *Diagram 6*

Apakah pasangan enzim yang boleh digunakan untuk menghasilkan lebih banyak jus buah?

What pair of enzymes can be used to produce more fruit juice?

- A Lipase dan tripsin
Lipase and trypsin
- B Amilase dan lipase
Amylase and lipase
- C Protease dan pektinase
Protease and pectinase
- D Selulase dan pektinase
Cellulase and pectinase

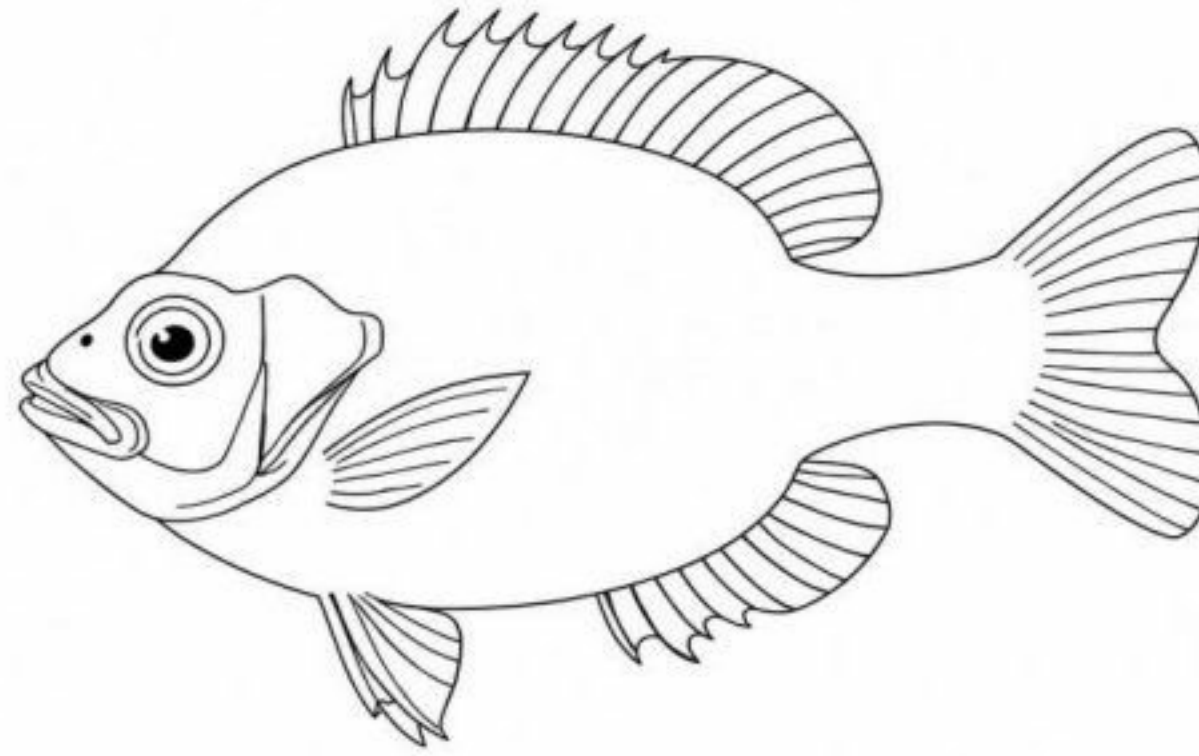
8. Antara berikut yang manakah ciri tumor benigna?
Which of the following is the characteristic of a benign tumor?
- A Tidak berbahaya
Not dangerous
 - B Berlaku akibat tak disjungsi kromosom
Occurs due to chromosomes nondisjunction
 - C Menyebabkan perubahan pada bilangan kromosom
Caused changes in the chromosomal number
 - D Boleh merebak ke organ lain melalui salur limfa dan salur darah
Can spread to others organ via lymph vessels and blood vessels
9. Rajah 7 menunjukkan perlakuan kromosom semasa pembahagian sel.
Diagram 7 shows chromosomal behavior during cell division.



Rajah 7 / *Diagram 7*

- Antara pernyataan berikut, yang manakah menerangkan perlakuan kromosom tersebut?
Which of the following statements describe the chromosome behavior?
- A Kromosom homolog berada di kutub bertentangan
Homologous chromosomes are at the opposite poles
 - B Kromosom homolog tersusun pada satah khatulistiwa
Homologous chromosomes lined up the equatorial plate
 - C Kromosom homolog berpisah dan tertarik ke kutub yang bertentangan
Homologous chromosomes are separated and pulled to the opposite poles
 - D Kromatid kembar berpisah dan tertarik ke kutub bertentangan oleh gentian gelendong
The sister chromatids are separated and attracted to the opposite poles by the spindle fibres

10. Rajah 8 menunjukkan seekor haiwan akuatik.
Diagram 8 shows an aquatic animal.



Rajah 8 / *Diagram 8*

Antara berikut, yang manakah merupakan struktur respirasi haiwan tersebut?
Which of the following is the respiratory structure of the animal?

- A Trakeol/ *Tracheole*
 - B Alveolus/ *Alveolus*
 - C Filamen / *Filament*
 - D Kulit lembap / *Moist skin*
11. Persamaan di bawah menunjukkan tindakbalas yang berlaku apabila karbon dioksida larut dalam plasma darah.
The equation below shows the reaction that occurs when carbon dioxide dissolves in blood plasma.



Mengapakah karbon dioksida perlu disingkirkan daripada badan?
Why does carbon dioxide need to be excreted from the body?

- A Karbon dioksida meningkatkan pH darah
Carbon dioxide raises blood pH
- B Karbon dioksida boleh membentuk keadaan berasid dalam darah
Carbon dioxide can create an acidic state in the blood.
- C Karbon dioksida diperlukan untuk fotosintesis
Carbon dioxide is needed for photosynthesis
- D Karbon dioksida menyebabkan tekanan darah meningkat
Carbon dioxide causes increase in blood pressure

12. Struktur vilus dalam usus kecil manusia terlibat dalam proses penyerapan hasil pencernaan makanan.
The structure of the villi in the human small intestine which are involved in the process of absorbing the digestive products of food.

Antara berikut, yang manakah menunjukkan padanan yang **betul**?
*Which of the following shows the **correct** match?*

	Bahan <i>Substance</i>	Mekanisme penyerapan <i>Absorption mechanism</i>
A	Asid amino <i>Amino acids</i>	Pengangkutan aktif <i>Active transport</i>
B	Fruktosa <i>Fructose</i>	Resapan ringkas <i>Simple diffusion</i>
C	Glukosa <i>Glucose</i>	Resapan berbantu <i>Facilitated diffusion</i>
D	Asid lemak dan gliserol <i>Fatty acid and glycerol</i>	Pengangkutan aktif <i>Active transport</i>

13. Jadual 1 menunjukkan eksperimen bagi menentukan kandungan vitamin C di dalam jus limau.
Table 1 shows an experiment to determine the content of vitamin C in lime juice.

Sampel <i>Sample</i>	Isipadu diperlukan untuk melunturkan 1.0 cm³ 0.1% larutan DCPIP <i>The volume required to bleach 1.0 cm³ of 0.1% DCPIP solution</i>
0.1 % Asid askorbik <i>0.1 % Ascorbic acid</i>	0.3
Jus limau nipis <i>Lime juice</i>	1.5

Jadual 1 / *Table 1*

Berapakah kepekatan vitamin C dalam jus limau nipis?
What is the concentration of vitamin C in lime juice?

- A 0.2 mg/cm³
- B 0.5 mg/cm³
- C 0.3 mg/cm³
- D 5.0 mg/cm³

14. Organisma multisel ini mempunyai sistem peredaran seperti berikut:
This multicellular organism has the following circulatory system:

- Sistem peredaran pulmokutaneus
Pulmocutaneous circulatory system
- Sistem peredaran sistemik
Systemic circulatory system

Apakah organisma itu?
What is the organism?

- A Manusia
Human
 - B Katak
Frog
 - C Ikan
Fish
 - D Kura kura
Tortoise
15. Seorang pesakit AIDS didapati sering mengalami jangkitan kulat pada mulut walaupun berada dalam persekitaran yang bersih.
An AIDS patient was found to frequently suffer from fungal infections in the mouth despite being in a clean environment.

Apakah yang menyebabkan keadaan tersebut?
What caused this situation?

- A Sistem respirasi pesakit gagal berfungsi
The patient's respiratory system fails to function
- B Mikroorganisma normal menjadi patogen apabila sistem keimunan lemah
Normal microorganisms become pathogens when the immune system is weak
- C HIV meningkatkan kadar pertumbuhan kulat dalam udara
HIV increases the growth rate of airborne fungi
- D HIV memusnahkan sel darah merah yang melawan jangkitan
HIV destroys red blood cells that fight infections

16. Rajah 9 menunjukkan pesakit dengan nodus limfa yang membengkak akibat sejenis jangkitan.

Diagram 9 shows a patient with swollen lymph nodes due to a type of infection.



Rajah 9/ Diagram 9

Mengapakah keadaan tersebut berlaku?

Why did this situation happen?

- A Penghasilan eritrosit meningkat
Erythrocyte production increases
 - B Pengumpulan limfosit untuk melawan patogen
Accumulation of lymphocytes to fight pathogens
 - C Pengumpulan bendalir tisu
Tissue fluid accumulation
 - D Tekanan darah meningkat secara mendadak
Blood pressure increases suddenly
17. Seorang murid mengalami batuk selepas berada dalam persekitaran berhabuk.
A student developed a cough after being in a dusty environment.

Antara berikut yang manakah akan menunjukkan gerak balas pada sistem pertahanan murid tersebut?

Which of the following represents the first line of defense?

- A Demam / *Fever*
- B Fagositosis / *Phagocytosis*
- C Membran mukus / *Mucous membrane*
- D Keradangan / *Inflammation*



18. Rajah 10 menunjukkan keratan akhbar berkaitan kemalangan jalan raya.
Diagram 10 shows newspaper clippings related to road accidents.

BERNAMA | 14 Mei 2026 | 11:45 MYT

Penunggang motosikal parah dilanggar pemandu mabuk lawan arus.
Motorcyclist seriously injured after being hit by a drunk driver travelling against traffic flow.

KUALA LUMPUR – Seorang penunggang motosikal cedera parah selepas dirempuh sebuah kereta yang dipandu secara melawan arus trafik oleh seorang lelaki dipercayai berada di bawah pengaruh alkohol. Menurut pihak polis, kemalangan berlaku pada waktu malam dan siasatan mendapati pemandu terbabit mengalami gangguan koordinasi dan tindak balas akibat pengambilan alkohol berlebihan.

***KUALA LUMPUR** – A motorcyclist was seriously injured after being hit by a car driven against the flow of traffic by a man believed to be under the influence of alcohol. According to police, the accident occurred at night and investigations found that the driver suffered from impaired coordination and reaction due to excessive alcohol consumption.*

Kes disiasat mengikut Akta Pengangkutan Jalan 1987.
The case is being investigated under the Road Transport Act 1987.

Rajah 10 / Diagram 10

Apakah kesan alkohol terhadap sistem saraf pemandu tersebut?
What is the effect of alcohol on the driver's nervous system?

- A Meningkatkan koordinasi badan
Improves body coordination
- B Mempercepat penghantaran impuls saraf
Speeds up the transmission of nerve impulses
- C Melambatkan gerak balas terhadap rangsangan
Slowing down responses to stimuli
- D Merangsang penghasilan neuron baharu
Stimulates the production of new neurons

19. Seorang atlet menjalani aktiviti fizikal yang intensif.
An athlete undergoes intense physical activity.

Apakah perubahan yang berlaku pada tekanan separa karbon dioksida di sel badan atlet tersebut?
What changes occur in the partial pressure of carbon dioxide in body cells of the athlete?

- A Menurun kerana respirasi berkurang
Decreased due to decreased respiration
 - B Meningkat kerana lebih banyak respirasi sel berlaku
Increases because more cellular respiration occurs
 - C Kekal sama sepanjang aktiviti
Remain the same throughout the activity
 - D Menjadi lebih rendah daripada alveolus
Being lower than the alveolus
20. Jadual 2 menunjukkan keputusan ujian urin seorang pesakit.
Table 2 shows the urine test results of a patient.

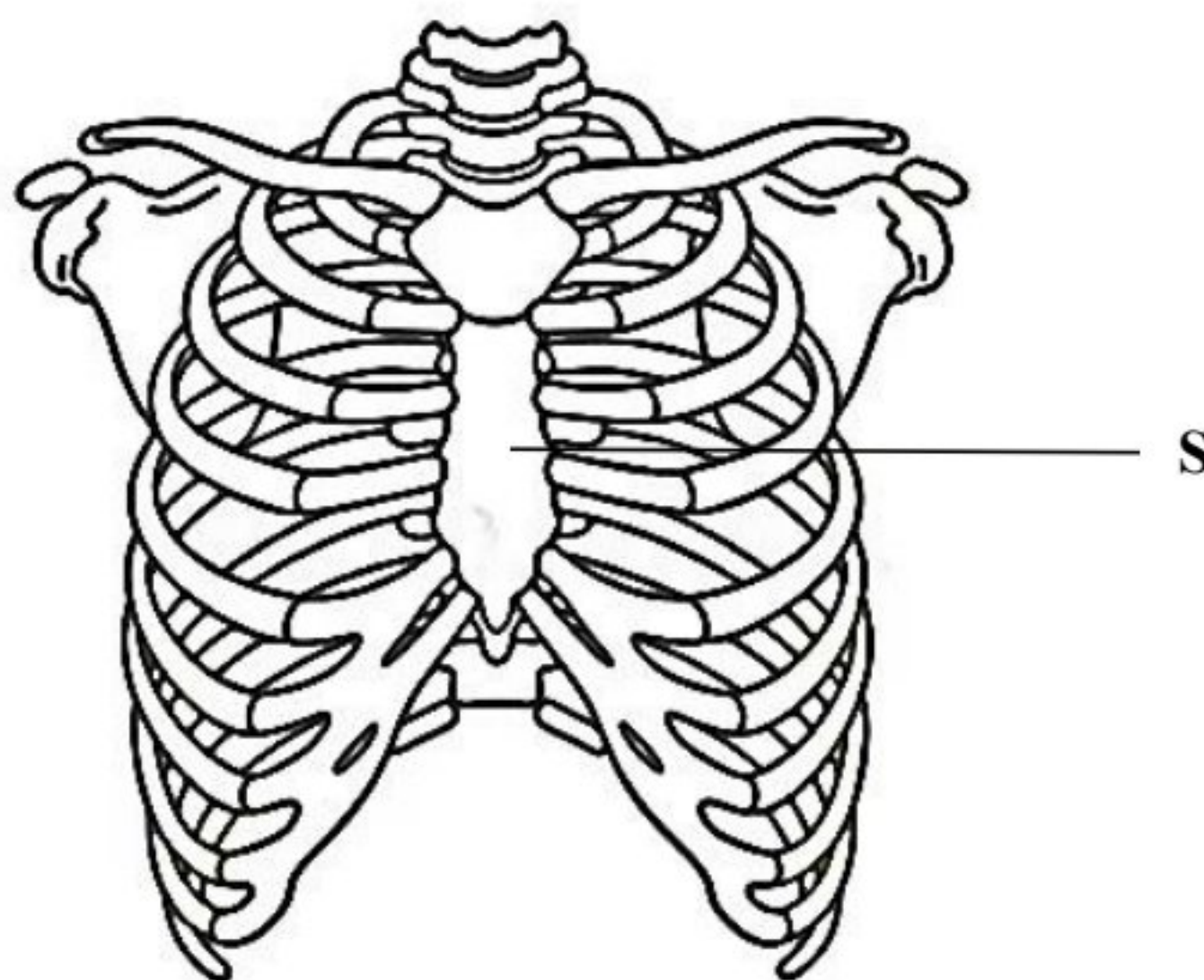
Bahan/ <i>Substance</i>	Kehadiran/ <i>Presence</i>
Glukosa/ <i>Glucose</i>	Ada/ <i>Present</i>
Protein plasma/ <i>Plasma protein</i>	Tiada/ <i>Absent</i>
Sel darah merah/ <i>Red blood cell</i>	Tiada / <i>Absent</i>

Jadual 2 / *Table 2*

Berdasarkan keputusan tersebut, bahagian manakah pada struktur nefron yang mengalami masalah?
Based on these results, which part of the nephron structure is experiencing problems?

- A Liku Henle / *Loop of Henle*
- B Glomerulus / *Glomerulus*
- C Tubul berlingkar distal / *Distal convoluted tubule*
- D Tubul berlingkar proksimal / *Proximal convoluted tubule*

21. Rajah 11 menunjukkan sebahagian daripada sistem rangka manusia.
Diagram 11 shows a section of the human skeletal system.



Rajah 11 / *Diagram 11*

Apakah tulang yang berlabel S?
What is the bone labelled S?

- A Rusuk / *Rib*
 - B Sternum / *Sternum*
 - C Skapula / *Scapula*
 - D Klavikel / *Clavicle*
22. Wanita berusia lebih mudah mendapat osteoporosis. Osteoporosis terjadi apabila
Older women are more likely to get osteoporosis. Osteoporosis happens when
- A ligamen menjadi lemah dan hilang kekenyalan
ligaments become weak and lose elasticity
 - B tulang menjadi lembut dan melengkung ke luar
bones become soft and curve outwards
 - C kepadatan tulang berkurang dan menjadi rapuh
bone density decreases and becomes brittle
 - D sendi menjadi haus dan bergesel antara satu sama lain
joints become worn and rub against each other

23. Rajah 12 menunjukkan kit ujian kehamilan.
Diagram 12 shows a pregnancy test kit.



Rajah 12 / *Diagram 12*

Kit ini menunjukkan keputusan positif kerana kandungan hormon X yang tinggi semasa fasa awal kehamilan. Apakah hormon X?
This kit shows a positive result due to the high levels of hormone X during the early phase of pregnancy. What is hormone X?

- A Hormon estrogen
Oestrogen hormone
 - B Hormon progesteron
Progesterone hormone
 - C Hormon perangsang folikel
Follicle stimulating hormone
 - D Hormon gonadotrofin korion manusia
Human chorionic gonadotrophin hormone
24. Maklumat di bawah menunjukkan ciri-ciri bagi sejenis tumbuhan.
The information below shows the characteristics of a type of plant.

- Tumbuh di kawasan beriklim sederhana.
Grows in temperate climates.
- Mempunyai fasa pertumbuhan tampang dan fasa pembiakan.
Has vegetative growth phase and reproductive phase.
- Mengambil masa dua tahun untuk melengkapkan kitar hidupnya
Takes two years to complete its life cycle

Pasangan tumbuhan manakah yang mempunyai ciri seperti dinyatakan di atas?
Which pair of plants has the characteristics stated above?

- A Tembikai dan labu
Watermelon and pumpkin
- B Lobak merah dan laici
Carrot and lychee
- C Kelapa dan kangkung
Coconut and water spinach
- D Balung ayam dan kubis
Silver cock's comb and cabbage

25. Rajah 13 menunjukkan keratan akhbar berkaitan keadaan cuaca panas di kawasan utara Malaysia.

Diagram 13 shows a newspaper clipping regarding hot weather conditions in northern Malaysia.

KANGAR, 7 Februari- Berdasarkan laporan terkini Mac-April 2026, beberapa kawasan di Semenanjung Malaysia, terutamanya di Kedah dan Perlis, telah merekodkan suhu panas Tahap 2 (Gelombang Haba).

KANGAR, 7 February - Based on the latest reports for March-April 2026, several areas in Peninsular Malaysia, especially in Kedah and Perlis, have recorded Level 2 (Heat Wave) hot temperatures.

Rajah 13/ Diagram 13

Tahap 2 (Gelombang haba) merujuk kepada suhu 37°C- 40°C. Bagaimanakah keadaan ini memberi kesan terhadap kadar fotosintesis?

Level 2 (Heat wave) refers to temperatures of 37°C- 40°C. How does this condition affect the rate of photosynthesis?

- A Kadar fotosintesis bertambah
The rate of photosynthesis increases
- B Kadar fotosintesis kekal
The rate of photosynthesis remains constant
- C Kadar fotosintesis berkurang
The rate of photosynthesis decreases

26. Encik M menambahkan baja fosforus dan magnesium kepada tumbuhannya setelah mendapati terdapat kesan kekurangan nutrien pada struktur daun tumbuhan tersebut.
Mr. M added phosphorus and magnesium fertilizer to his plants after noticing an abnormality in the structure of the plant's leaves.

Apakah kesan kekurangan nutrien pada daun tersebut?
What are the effects of nutrient deficiency on the leaves?

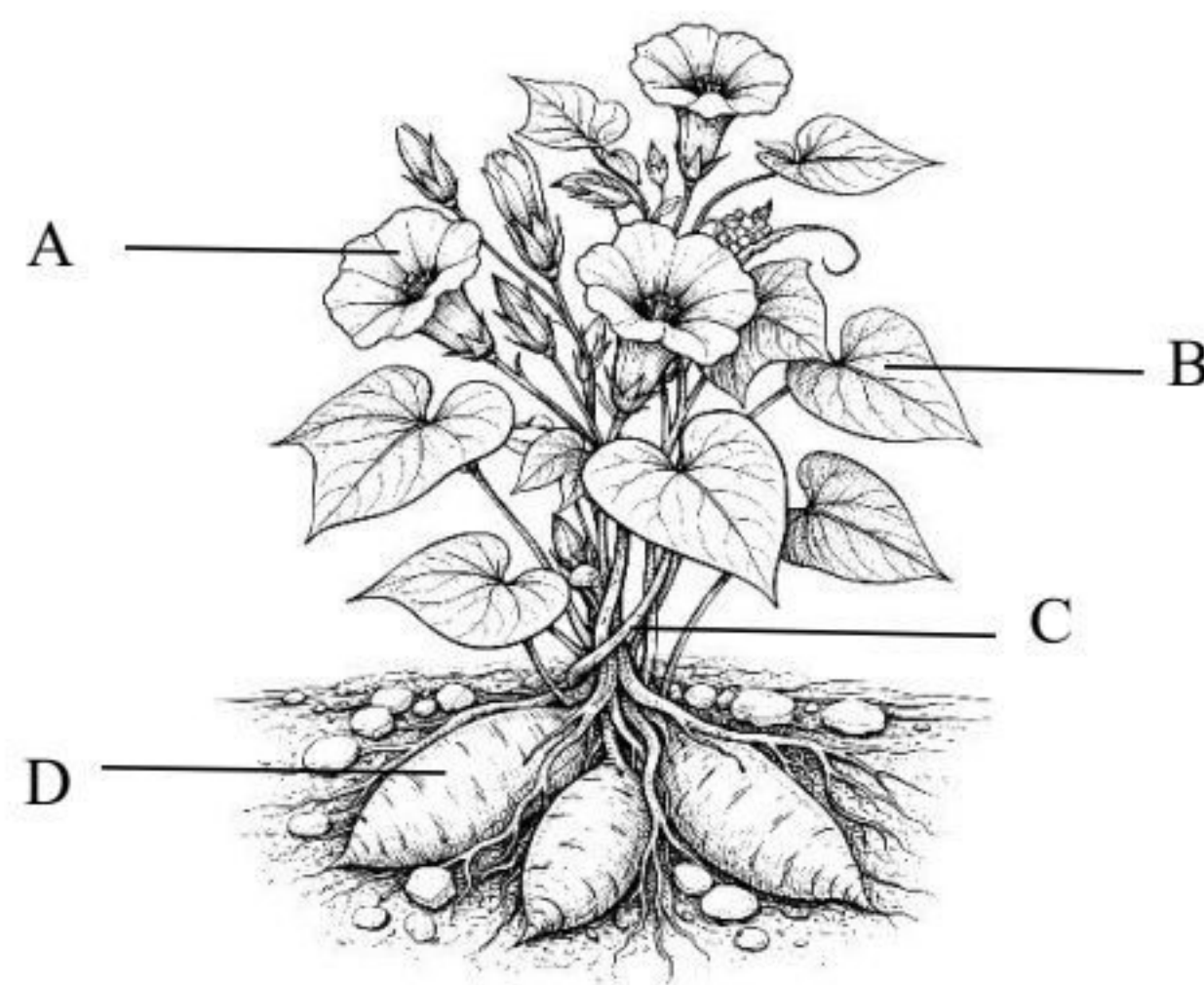
- A Mengalami klorosis
Experience chlorosis
- B Mempunyai bintik merah
Have red spots
- C Menjadi bercuping
Become lobed
- D Mempunyai kesan terbakar di pinggir daun
Have burnt marks on the edges of the leaves

27. Manakah antara berikut penyesuaian pada pokok periuk kera untuk menjadi tumbuhan karnivor?
Which of the following is an adaptation of the pitcher plant to become a carnivorous plant?

- I. Mempunyai kelongsong
Has cup
- II. Mempunyai bau yang kuat
Has strong smell
- III. Mempunyai jus pencernaan
Secrete digestive enzyme
- IV. Mempunyai warna yang menarik
Has attractive colour

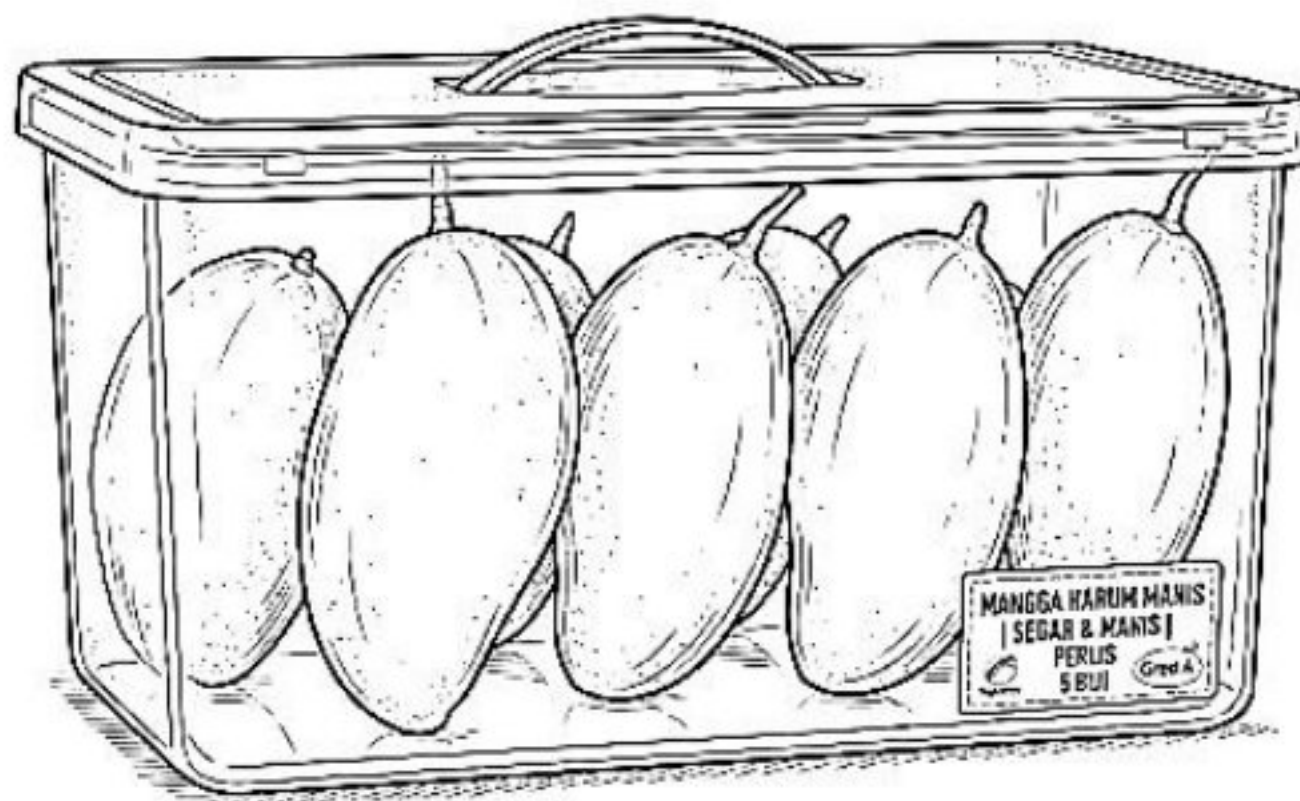
- A I dan II / *I and II*
- B I dan III / *II and III*
- C II dan III / *II and III*
- D III dan IV / *III and IV*

28. Translokasi akan membawa hasil fotosintesis ke organ simpanan.
Translocation will carry the products of photosynthesis to the storage organ.
Bahagian manakah yang bertindak sebagai organ simpanan pada pokok di bawah?
Which part acts as a storage organ in the tree below?



29. Rajah 14 menunjukkan kaedah yang digunakan oleh Puan N untuk menyimpan buah mangganya.

Diagram 14 shows the method used by Mrs. N to store her mangoes.



Rajah 14 / Diagram 14

Kaedah ini dapat memastikan semua mangga masak dengan serentak. Apakah faktor yang membantu pemasakan buah mangga tersebut?

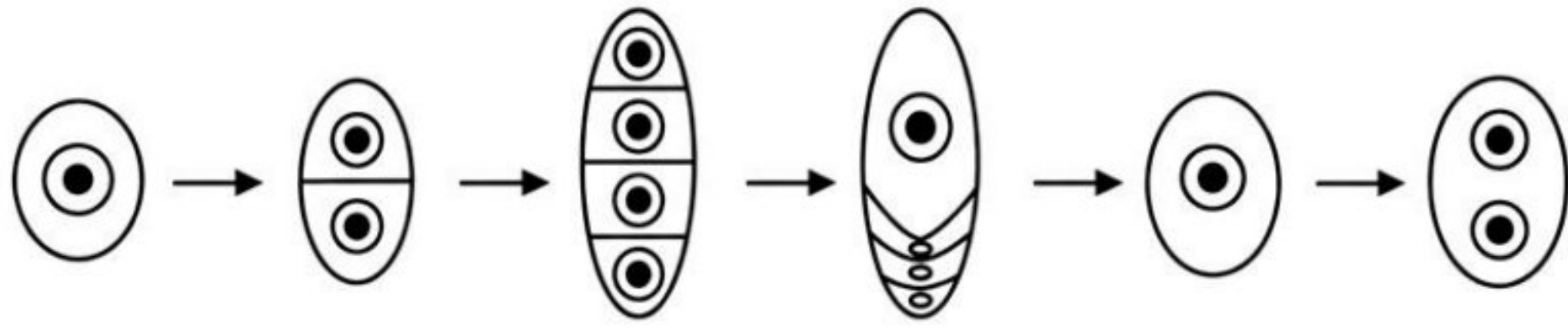
This method ensures that all the mangoes ripen at the same time. *What factor helps the mangoes to ripen?*

- A Etilena yang tersebar sama rata
Ethylene is evenly distributed
 - B Giberelin tersebar sama rata
Gibberellin is evenly distributed
 - C Cahaya dapat menembusi bekas lutsinar
Light can penetrate the transparent container
 - D Gas karbon dioksida tidak terbebas ke persekitaran
Carbon dioxide gas is not released into the environment
30. Penjelasan manakah menunjukkan pembentukan nukleus endosperma yang betul?
Which explanation best describes the formation of triploid endosperm nucleus?
- A Satu gamet jantan bercantum dengan dua sel antipodal
One male gamete fuses with two antipodal cells
 - B Satu gamet jantan bercantum dengan dua sel sinergid
One male gamete fuses with two synergid cells
 - C Satu gamet jantan bercantum dengan dua nukleus kutub
One male gamete fuses with two polar nuclei
 - D Satu gamet jantan bercantum dengan dua sel telur
One male gamete fuses with two egg cells

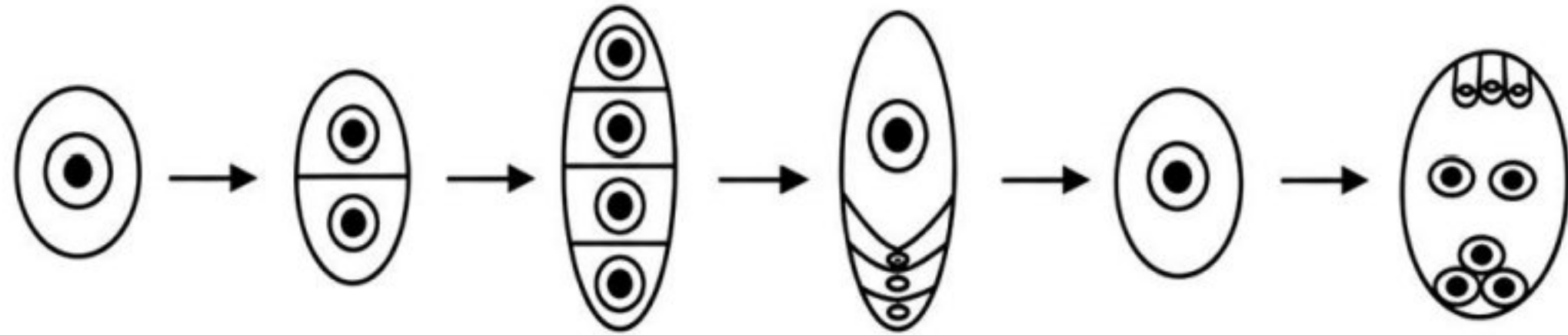


31. Antara berikut, yang manakah susunan yang betul bagi pembentukan pundi embrio?
Which of the following is the correct sequence for the formation of the embryo sac?

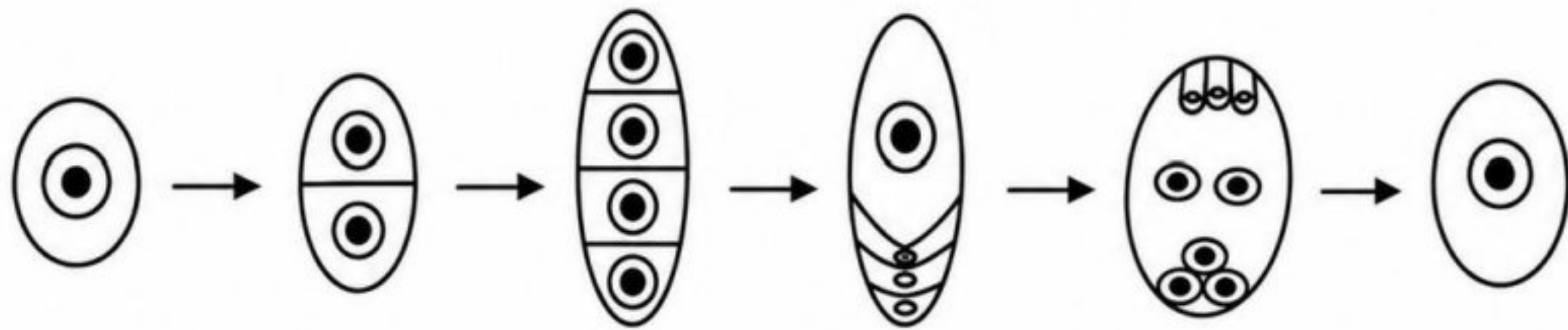
A



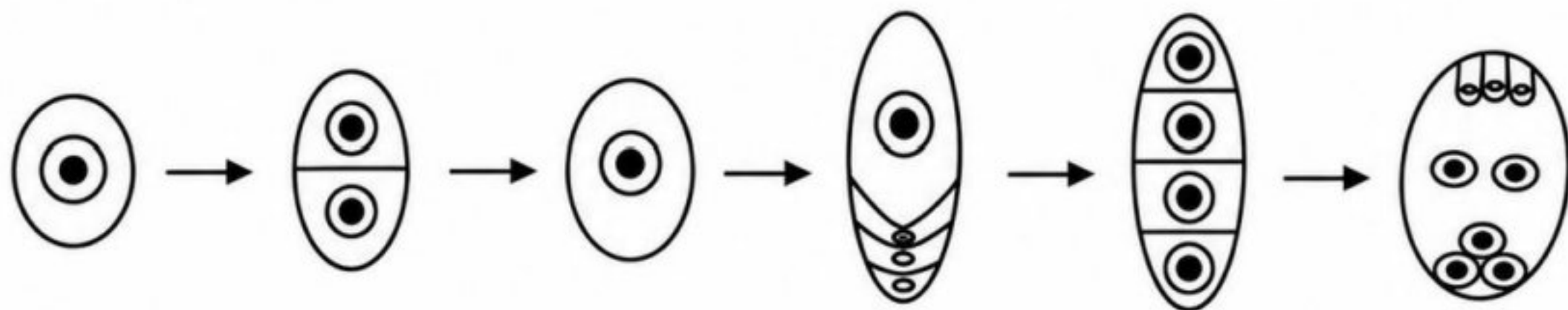
B



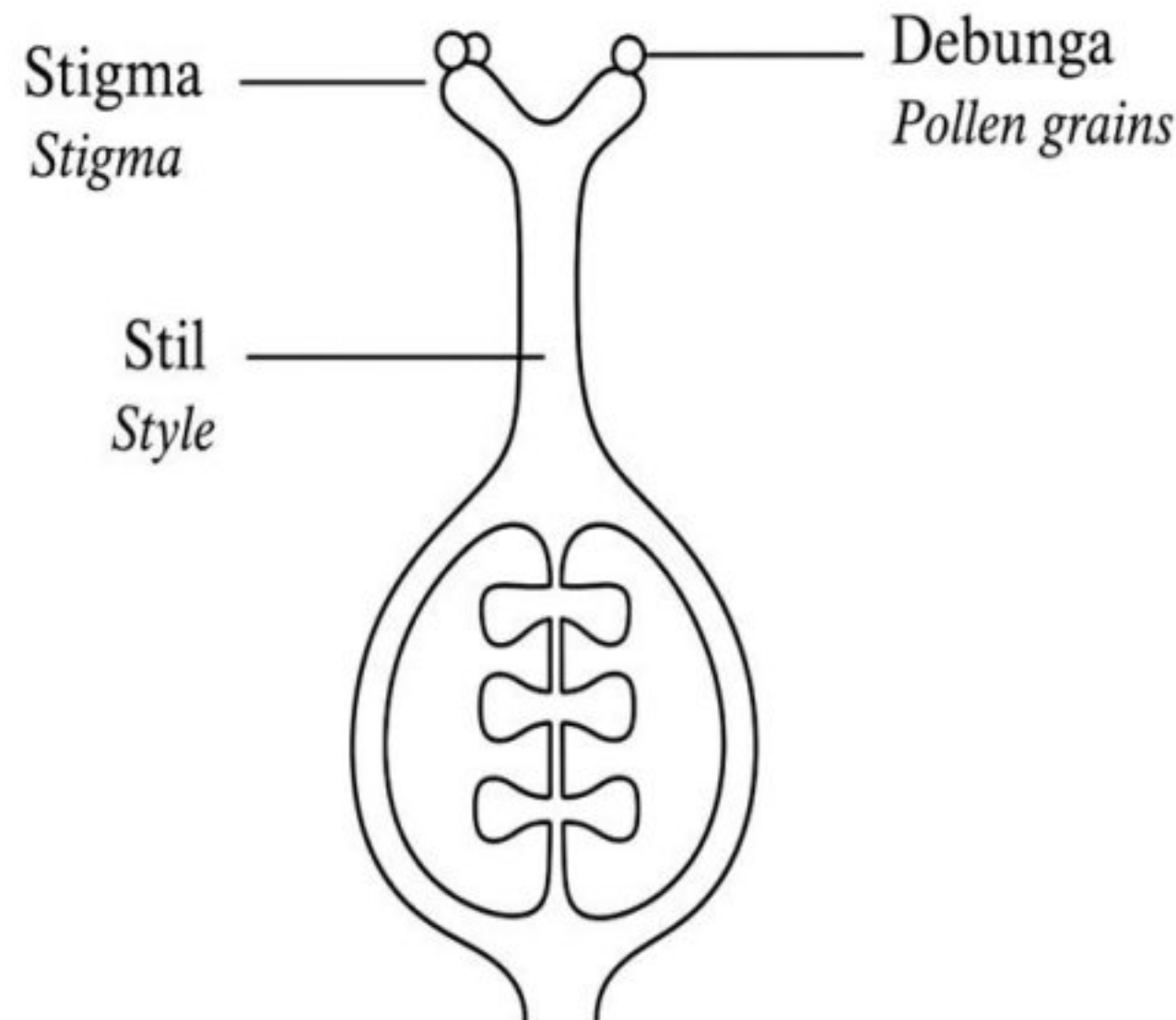
C



D



32. Rajah 15 menunjukkan debunga yang melekat di atas stigma.
Diagram 15 shows pollen grains that are attached onto the stigma.



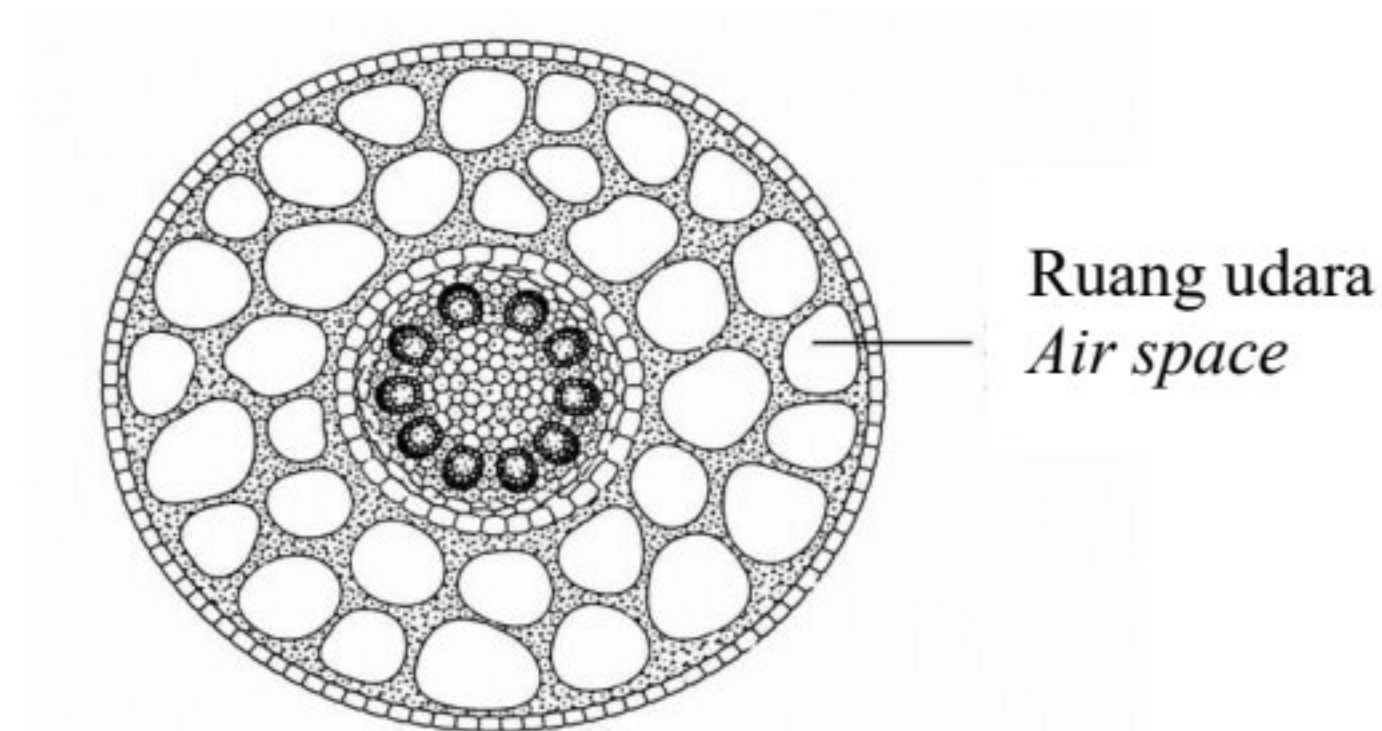
Rajah 15 / Diagram 15

Berapakah bilangan biji benih yang terhasil sekiranya semua debunga berjaya bercambah?

How many seeds are produced if all pollen grains are successful to germinate?

- A 6
 - B 5
 - C 3
 - D 1
33. Antara pernyataan berikut, yang manakah benar tentang eutrofikasi?
Which of the following statements is true about eutrophication?
- A Proses eutrofikasi tidak mempengaruhi BOD di kolam.
The eutrophication process does not affect BOD in the pond.
 - B Peningkatan fosfat dan nitrat menggalakkan pertumbuhan alga di permukaan air.
Increase in phosphate and nitrate promote algae bloom at the water surface.
 - C Proses eutrofikasi membantu meningkatkan populasi hidupan akuatik di dalam kolam.
Eutrophication process help to increase population of aquatic life in pond
 - D Semasa eutrofikasi, bakteria pengurai menjalankan proses penguraian secara anaerobik.
During eutrophication, decomposer bacteria decomposed anaerobically

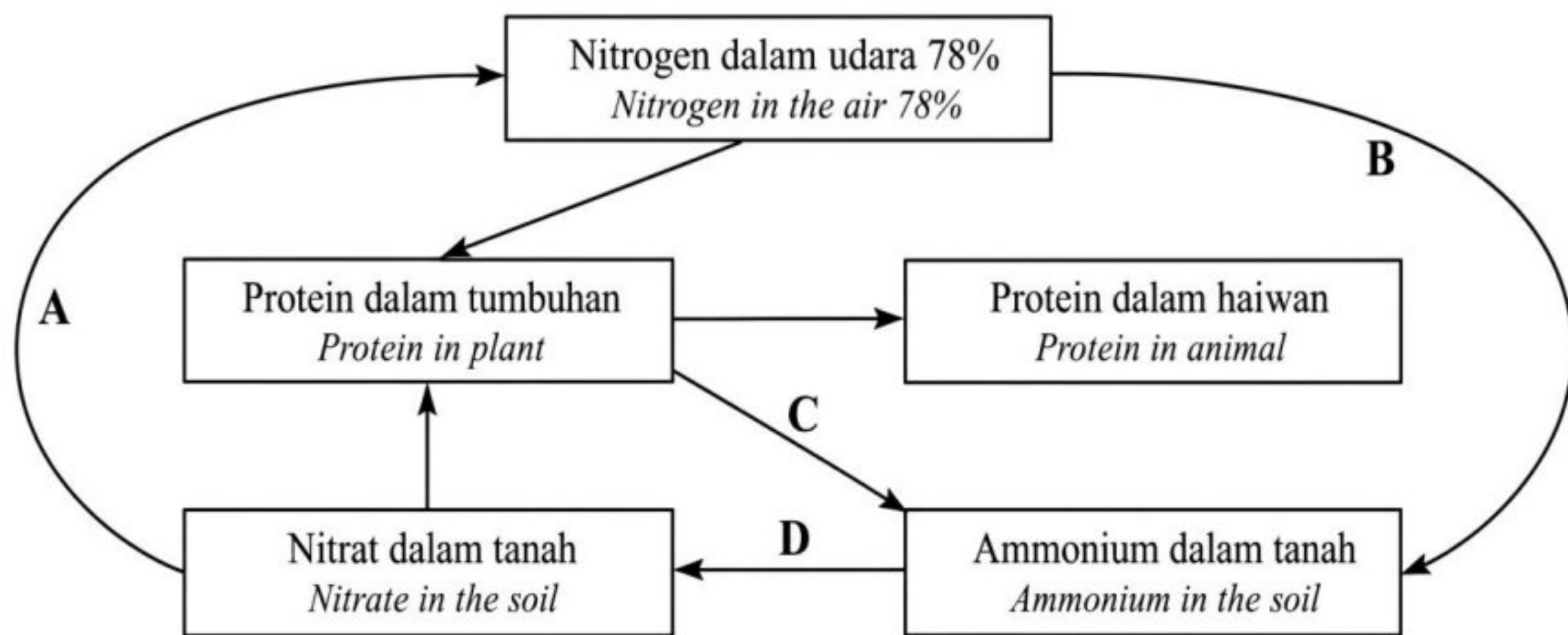
34. Rajah 16 menunjukkan struktur tisu khas yang terdapat pada sejenis tumbuhan.
Diagram 16 shows a structure of specialised tissue in a type of plant.



Rajah 16 / Diagram 16

Antara berikut yang manakah jenis tumbuhan tersebut?
Which of the following is the type of plant?

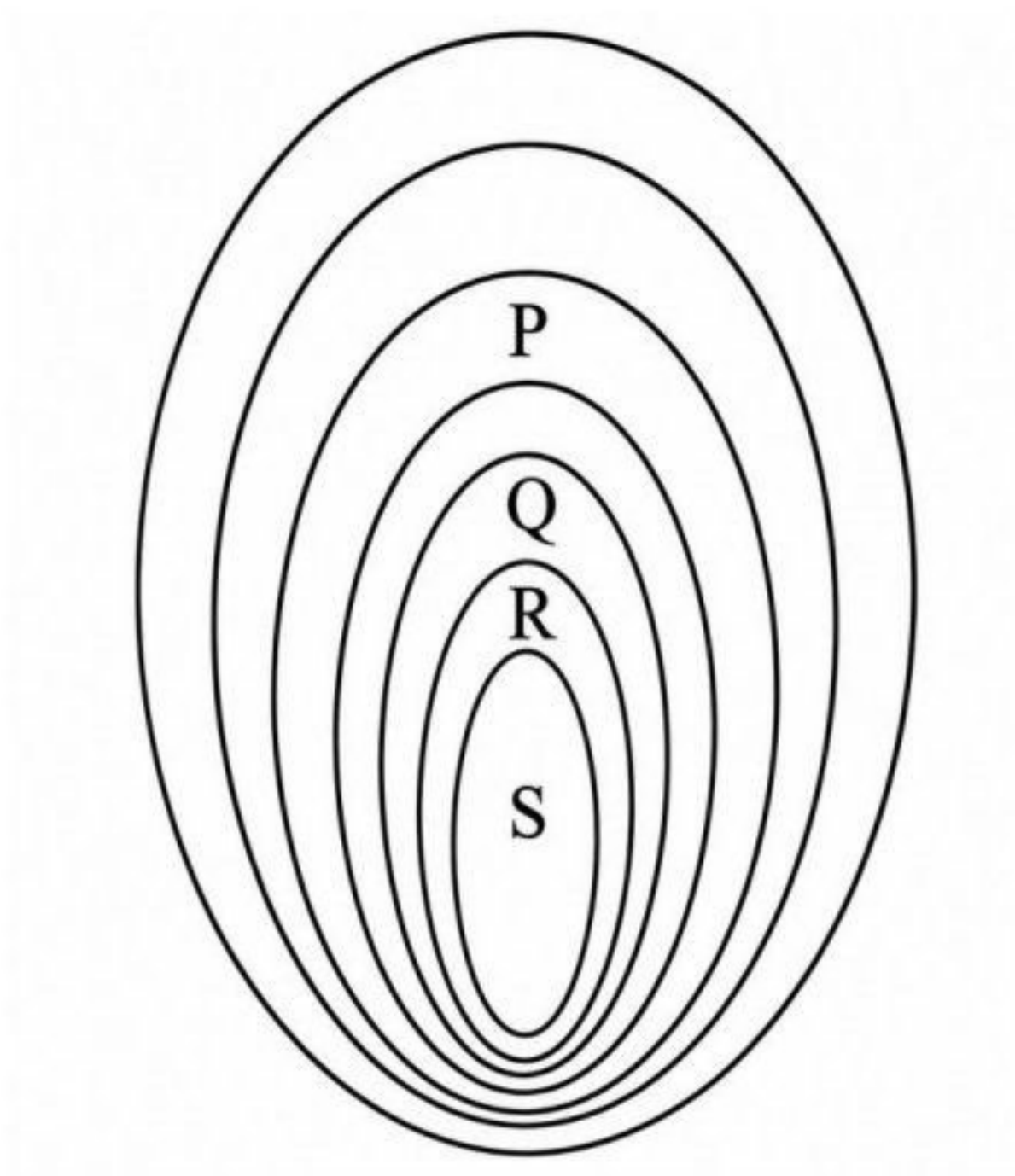
- A Xerofit
Xerophytes
 - B Mesofit
Mesophytes
 - C Halofit
Halophytes
 - D Hidrofit
Hydrophytes
35. Rajah 17 menunjukkan sebahagian daripada kitar nitrogen.
Diagram 17 shows part of the nitrogen cycle.



Rajah 17 / Diagram 17

Antara proses A, B, C dan D, yang manakah mewakili proses pereputan?
Which of the processes A, B, C and D represents the decay process?

36. Rajah 18 menunjukkan hierarki taksonomi.
Diagram 18 shows the taxonomy hierarchy.

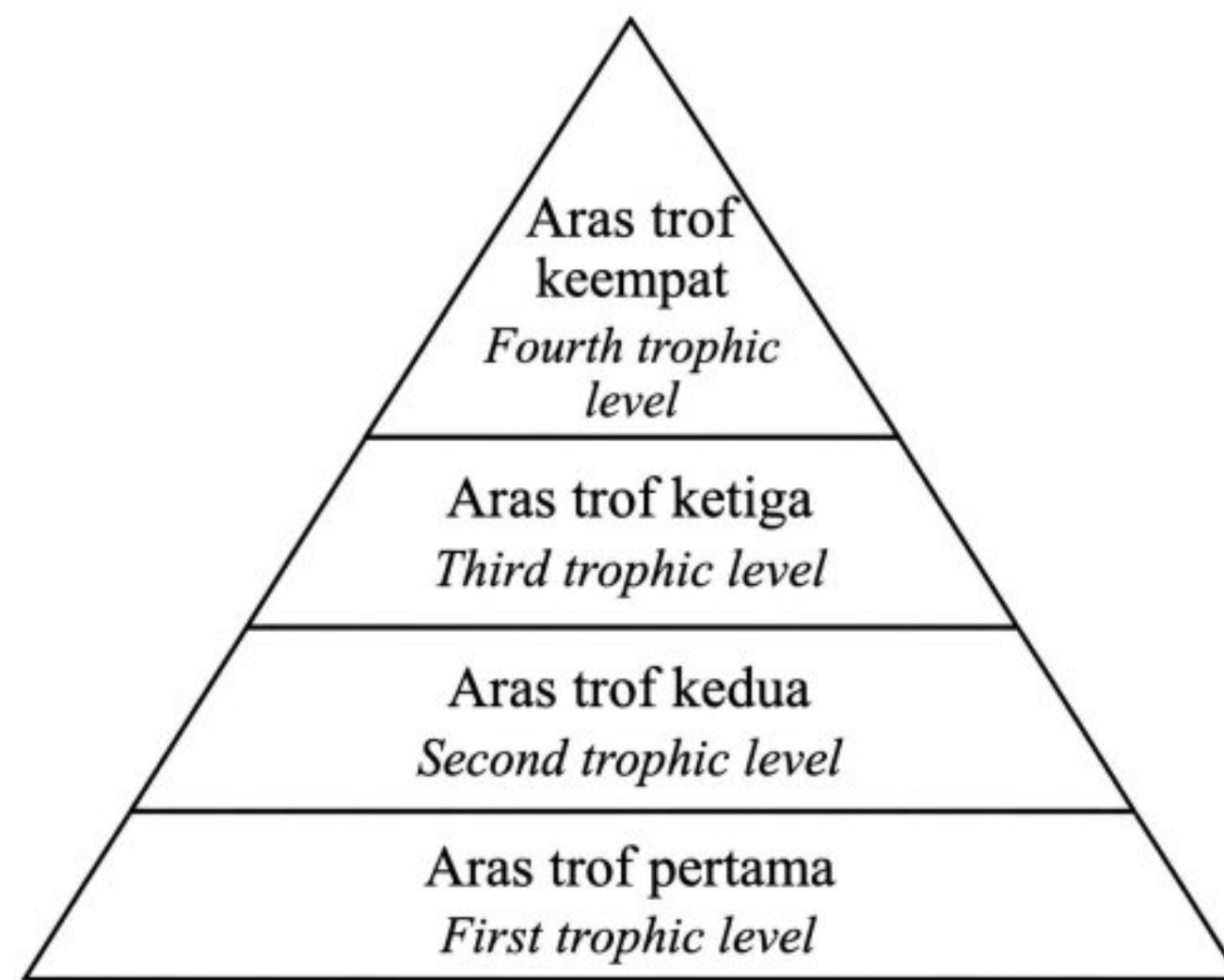


Rajah 18 / *Diagram 18*

Antara berikut, yang manakah **betul**?
*Which of the following is **correct**?*

	P	Q	R	S
A	Filum <i>Phylum</i>	Kelas <i>Class</i>	Famili <i>Family</i>	Genus <i>Genus</i>
B	Kelas <i>Class</i>	Order <i>Order</i>	Famili <i>Family</i>	Spesies <i>Species</i>
C	Kelas <i>Class</i>	Famili <i>Family</i>	Genus <i>Genus</i>	Spesies <i>Species</i>
D	Famili <i>Family</i>	Kelas <i>Class</i>	Genus <i>Genus</i>	Spesies <i>Species</i>

37. Rajah 19 menunjukkan satu piramid bilangan.
Diagram 19 shows a pyramid of numbers.

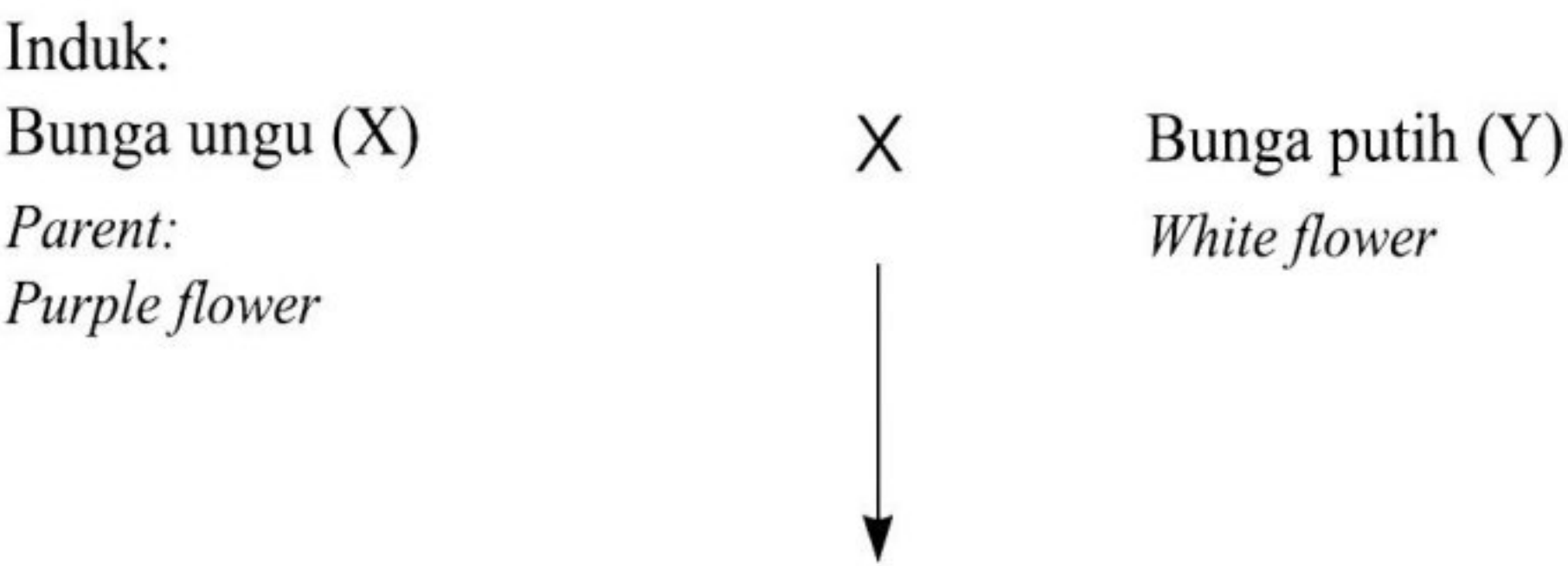


Rajah 19 / *Diagram 19*

Antara organisma berikut, yang manakah menduduki aras trof kedua?
Which of the following organisms occupies the second trophic level?

- A Arnab / *Rabbit*
 - B Cendawan / *Mushroom*
 - C Ular / *Snake*
 - D Rumput / *Grass*
38. Seorang bayi lelaki telah disahkan sebagai pengidap Klinefelter.
Apakah yang menyebabkan keadaan ini berlaku?
A baby boy has been confirmed to have Klinefelter's.
What causes this condition?
- A Tak disjungsi kromosom X semasa anafasa
Nondisjunction X chromosome during anaphase
 - B Tak disjungsi kromosom X semasa anafasa I
Nondisjunction X chromosome during anaphase I
 - C Tak disjungsi kromosom X semasa metafasa I
Nondisjunction X chromosome during metaphase I
 - D Tak disjungsi kromosom X semasa metafasa II
Nondisjunction X chromosome during metaphase II

39. Rajah 20 ialah rajah skema yang menunjukkan kacukan antara dua pokok kacang pis.
Diagram 20 is a schematic diagram that shows a cross pollination between two pea plants.



Nisbah fenotip: 1 bunga ungu : 1 bunga putih anak
Phenotypic ratio: 1 purple flower : 1 white flower of offspring

Rajah 20 / *Diagram 20*

Sifat bunga ungu pada pokok kacang pis dikawal oleh alel dominan ‘B’ dan bunga putih dikawal oleh alel resesif ‘b’. Apakah genotip induk tersebut?
In pea plants, purple flower is controlled by dominant allele ‘B’ and white flower is controlled by recessive allele ‘b’. What are the genotypes of the parents?

	Induk X / <i>Parent X</i>	Induk Y/ <i>Parent Y</i>
A	Bb	bb
B	Bb	BB
C	BB	Bb
D	Bb	Bb

40. Pemprofilan DNA ialah teknik forensik yang digunakan untuk mengenal pasti individu berdasarkan DNA mereka. Ia lebih saintifik, tepat dan maju berbanding dengan cap jari dalam penyiasatan jenayah.

DNA profiling is a technique used in forensic to identify individuals, based on their DNA. It is more scientific, accurate and advanced compared to the thumbprint in criminal investigation.

Bagaimanakah teknik ini dapat mengenal pasti individu yang bersalah dengan tepat?
How can this technique accurately identify the guilty individual?

- A DNA adalah serupa untuk individu dari spesies yang sama
DNA is similar for individuals from the same species
- B Saintis forensik menguji sampel dan menganalisisnya mengikut pilihan mereka
The forensic scientist tests the sample and analyses it according to their preference
- C Mudah untuk mendapatkan sampel mengandungi DNA seperti pada senjata, pakaian dan peralatan
It is easy to get samples containing DNA such as on the weapon, clothing and equipment
- D Teknik ini dapat membandingkan sampel DNA pada bahan bukti dengan sampel DNA suspek
This technique can compare DNA samples in evidence with DNA samples from suspects

KERTAS SOALAN TAMAT
END OF QUESTION PAPER