

**1** Which organ consists of cells which have the highest density of rough endoplasmic reticulum?  
*Organ manakah mengandungi sel-sel yang mempunyai kepadatan jalinan endoplasma kasar yang paling tinggi?*

- A. Stomach/ *Perut*
- B. Heart/ *Jantung*
- C. Brain/ *Otak*
- D. Kidney/ *Ginjal*

**2** The following statements are about the cell components.  
*Pernyataan berikut adalah mengenai komponen sel.*

K- Contains hereditary factors  
*Mengandungi faktor-faktor pewarisan*

L- Acts as medium for metabolic reactions  
*Bertindak sebagai medium tindakbalas metabolik*

Based on the information above, which is true?  
*Berdasarkan maklumat di atas, yang manakah benar?*

	<b>K</b>	<b>L</b>
<b>A</b>	Nucleolus <i>Nukleolus</i>	Mitochondria <i>Mitokondria</i>
<b>B</b>	Chloroplast <i>Kloroplas</i>	Nucleus <i>Nukleus</i>
<b>C</b>	Nucleus <i>Nukleus</i>	Cytoplasm <i>Sitoplasma</i>
<b>D</b>	Mitochondria <i>Mitokondria</i>	Cell membrane <i>Membran sel</i>

- 3 Diagram 1 shows cell P, cell Q and tissue R which are found in the human body.  
Rajah 1 menunjukkan sel P, sel Q dan tisu R yang dijumpai dalam badan manusia.



Cell P/ Sel P



Cell Q/ Sel Q



Tissue R/ Tisu R

Diagram 1  
Rajah 1

Which of the following systems are matched correctly?  
Antara berikut, sistem yang manakah dipadankan dengan betul?

	Cell P/ Sel P	Cell Q/ Sel Q	Tissue R/ Tisu R
A	Nervous system <i>Sistem saraf</i>	Circulatory system <i>Sistem peredaran</i>	Reproductive system <i>Sistem pembiakan</i>
B	Circulatory system <i>Sistem peredaran</i>	Nervous system <i>Sistem saraf</i>	Respiratory system <i>Sistem respirasi</i>
C	Respiratory system <i>Sistem respirasi</i>	Circulatory system <i>Sistem peredaran</i>	Skeletal system <i>Sistem rangka</i>
D	Respiratory system <i>Sistem respirasi</i>	Reproductive system <i>Sistem pembiakan</i>	Nervous system <i>Sistem saraf</i>

- 4 Diagram 2 shows the condition of a plant cell after placing it in solution X for 15 minutes.  
Rajah 2 menunjukkan keadaan satu sel tumbuhan selepas dimasukkan dalam larutan X selama 15 minit.

Diagram 2  
Rajah 2

What is X?  
Apakah X?

- A. Distilled water / *air suling*  
B. 1% salt solution./ *Larutan garam 1%*  
C. 5% sucrose solution / *Larutan sukrosa 5%*  
D. 20% sucrose solution / *Larutan sukrosa 20%*

- 5 Diagram 3 shows an experiment conducted by a student.  
*Rajah 3 menunjukkan satu eksperimen yang dijalankan oleh seorang murid.*

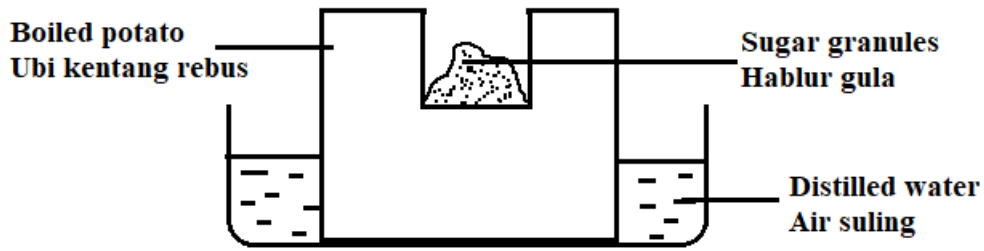
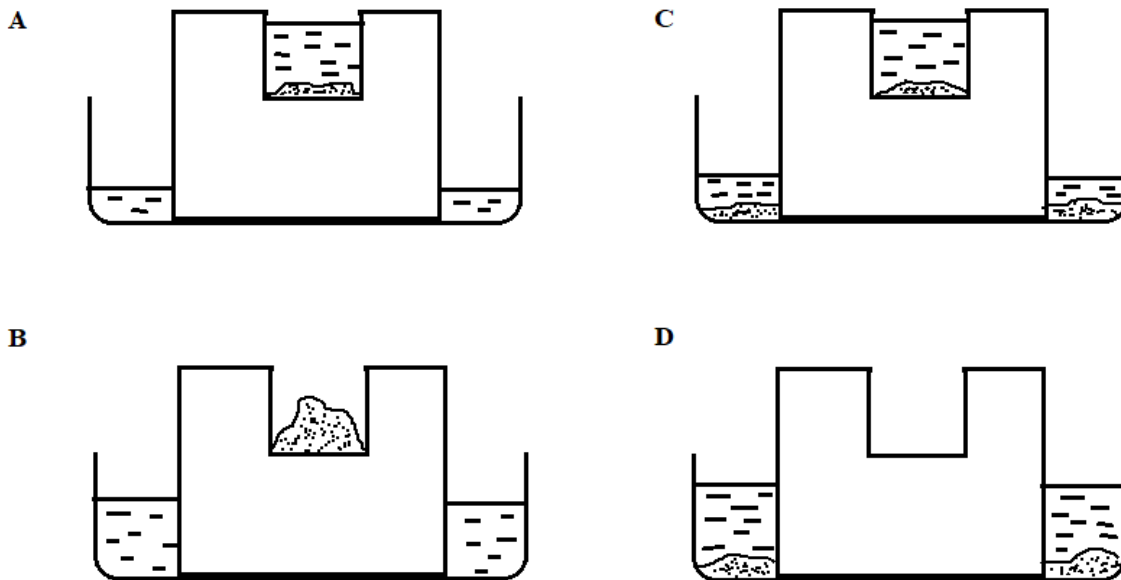


Diagram 3  
*Rajah 3*

Which will be the result of the experiment after 30 minutes?  
*Yang manakah adalah keputusan eksperimen selepas 30 minit?*



- 6 Why does salted fish remain preserved after a few months?  
*Mengapakah ikan masin kekal terawet selepas beberapa bulan?*
- A The growth of bacteria does not occur  
*Pertumbuhan bakteria tidak berlaku*
  - B The pH of the solution used is high  
*pH larutan yang digunakan adalah tinggi*
  - C The water content in the fish is maintained  
*Kandungan air dalam ikan dikekalkan*
  - D Water molecules enter the fish cells by osmosis  
*Molekul air memasuki sel-sel ikan secara osmosis*
- 7 Which type of carbohydrate is found in abundance in the liver cells?  
*Apakah jenis karbohidrat yang banyak dijumpai di dalam sel hati?*
- A Starch  
*Kanji*
  - B Sucrose  
*Sukrosa*
  - C Glycogen  
*Glikogen*
  - D Glucose  
*Glukosa*
- 8 Which of the following statement is true about unsaturated fats?  
*Antara berikut, pernyataan yang manakah betul tentang lemak tak tepu?*
- A High content of cholesterol  
*Kandungan kolesterol yang tinggi*
  - B Solid form at room temperature  
*Berbentuk pepejal pada suhu bilik*
  - C Contains maximum number of hydrogen atoms  
*Mengandungi bilangan atom hidrogen yang maksimum*
  - D Contains at least one double bond between the carbon atoms  
*Mengandungi sekurang-kurangnya satu ikatan ganda dua antara atom karbon*

- 9 The following information is about the application of an enzyme in industries.  
*Maklumat berikut adalah berkenaan aplikasi sejenis enzim dalam industri.*

- Removes the seed coats from cereal grains  
*Menanggalkan kulit biji benih daripada bijirin*
- Extracts agar jelly from seaweeds.  
*Mengekstrak agar-agar daripada rumpai laut.*

Which of the following is the enzyme?  
*Antara berikut, yang manakah enzim tersebut?*

- A Zymase  
*Zimase*
- B Amylase  
*Amilase*
- C Protease  
*Protease*
- D Cellulase  
*Selulase*
- 10 Diagram 4 shows the chromosomes in a cell during prophase of mitosis.  
*Rajah 4 menunjukkan kromosom dalam satu sel semasa profasa dalam mitosis.*

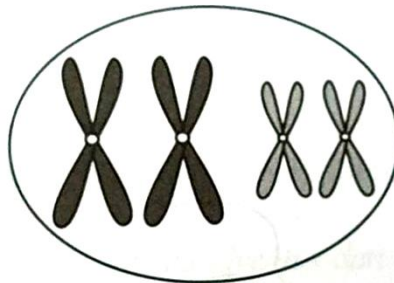
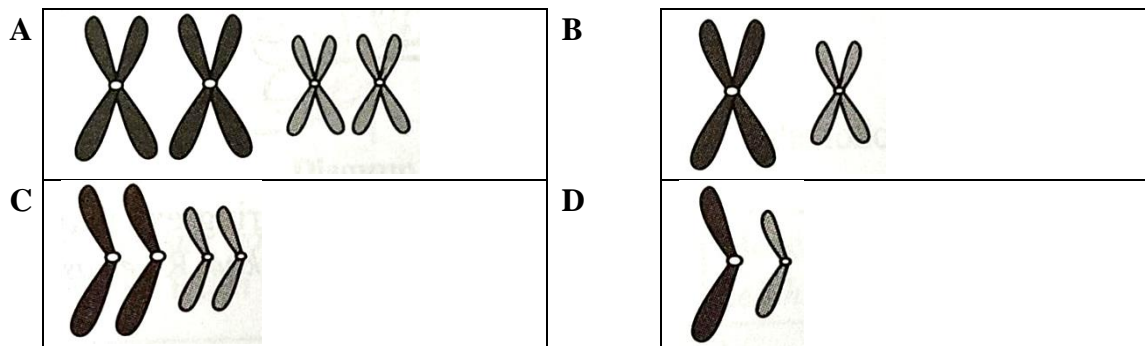


Diagram 4  
*Rajah 4*

Which of the following is the condition of chromosomes during telophase?  
*Antara berikut, yang manakah keadaan kromosom semasa telofasa?*



- 11 Diagram 5 shows the phases in the mitotic cell division.  
Rajah 5 menunjukkan fasa pembahagian sel secara mitosis.

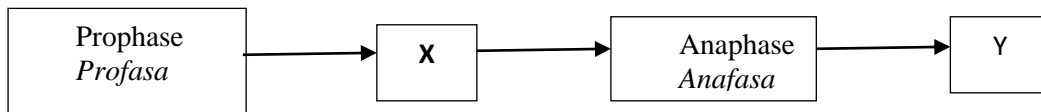


Diagram 5  
Rajah 5

Which of the following statements is true about the chromosomes at stages X and Y?  
Antara berikut yang manakah betul tentang kromosom pada peringkat X dan Y?

	X	Y
A	Chromosomes shorten and thicken <i>Kromosom menebal dan memendek</i>	The chromosomes form chromatids which move to the opposite poles of the cell <i>Kromosom membentuk kromatid yang bergerak ke kutub berlawanan</i>
B	The chromosomes have replicated <i>Kromosom telah bereplikasi</i>	The chromosomes start to elongate and not clearly visible <i>Kromosom mula memanjang dan tidak jelas kelihatan</i>
C	Chromosomes are at the equator plate <i>Kromosom berada pada satah khatulistiwa</i>	The chromosomes are at the opposite poles of the cell <i>Kromosom berada di kutub sel bertentangan</i>
D	The chromosomes form twin chromatids <i>Kromosom membentuk kromatid berkembar</i>	The homologous chromosomes are paired <i>Kromosom homolog berpasangan</i>

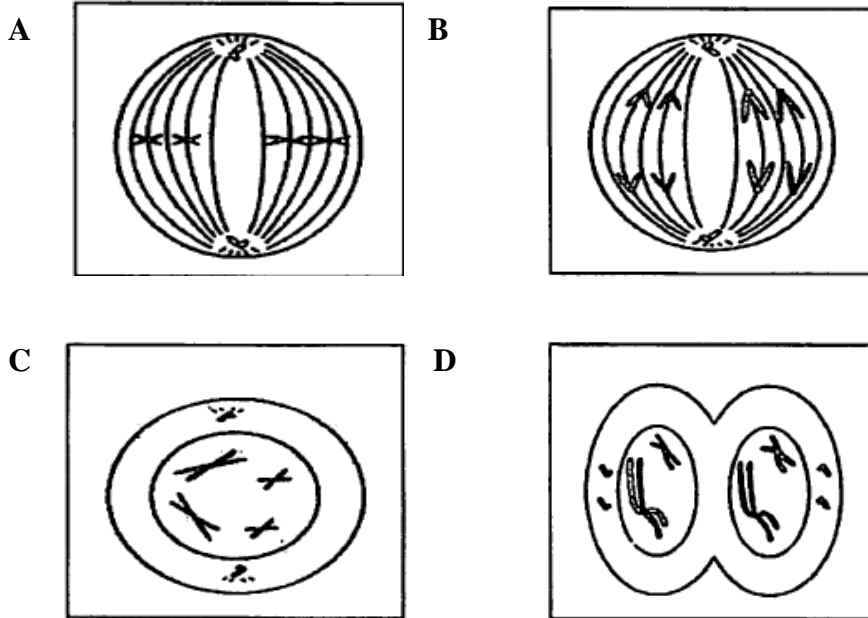
- 12 Meiosis produces gametes that contain half the number of chromosomes (haploid) of the parent cells (diploid).  
*Meiosis menghasilkan gamet yang mempunyai bilangan kromosom separuh (haploid) daripada bilangan kromosom sel induknya (diploid).*

Which of the following does not involve meiosis?  
Antara berikut yang manakah tidak melibatkan meiosis?

- A. Production of a new species  
*Penghasilan spesies yang baru*
- B. Production of clones  
*Penghasilan klon*
- C. Production of pollen grains  
*Penghasilan butir debunga*
- D. Production of sperm cells  
*Penghasilan sel sperma*

- 13 Cell X has 4 chromosomes.  
*Sel X mempunyai 4 kromosom.*

Which of the following shows a stage in meiosis of cell X?  
*Yang manakah antara berikut menunjukkan peringkat dalam meiosis pada sel X?*



- 14 Diagram 6 shows children suffering from a disease.  
*Rajah 6 menunjukkan kanak-kanak yang menghidapi sejenis penyakit.*



Diagram 6  
*Rajah 6*

Which class of food is needed by these children?  
*Apakah kelas makanan yang diperlukan oleh kanak-kanak tersebut?*

- A. Carbohydrates  
*Karbohidrat*
- B. Protein  
*Protein*
- C. Fibre  
*Pelawas*
- D. Lipid  
*Lipid*

- 15 Diagram 7 shows the human digestive system.  
Rajah 7 menunjukkan sistem pencernaan manusia

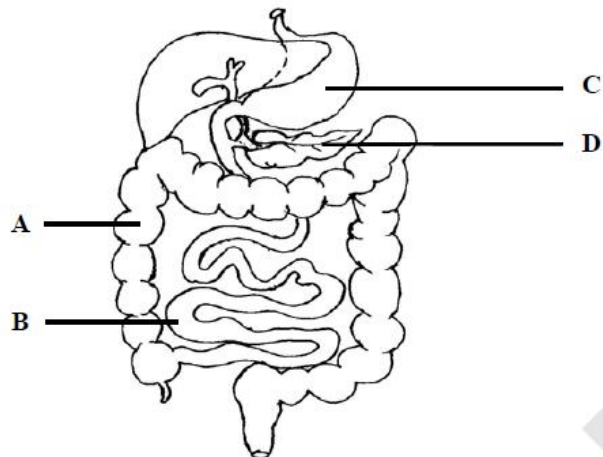


Diagram 7  
Rajah 7

Which organ secretes hydrochloric acid?  
Organ yang manakah merembeskan asid hidroklorik?

- 16 Diagram 8 shows the structure of a villus in the ileum.  
Rajah 8 menunjukkan struktur vilus dalam ileum.

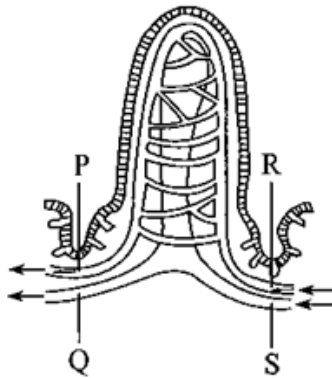


Diagram 8  
Rajah 8

Which of the following carry large amounts of glucose and fat-soluble vitamins?  
Antara berikut, yang manakah membawa banyak glukosa dan vitamin larut lemak?

	<b>Glucose Glukosa</b>	<b>Fat soluble vitamins Vitamin larut lemak</b>
<b>A</b>	P	Q
<b>B</b>	R	S
<b>C</b>	Q	P
<b>D</b>	S	R



- 17 Diagram 9 shows a health problem caused by unhealthy eating habits practiced by a teenager.  
*Rajah 9 menunjukkan masalah kesihatan berpunca dari tabiat pemakananan yang tidak sihat yang diamalkan oleh seorang remaja.*



Diagram 9 / *Rajah 9*

Based diagram 9, what are the health problem and the effect of this practice on her health?  
*Berdasarkan rajah 9, apakah masalah kesihatan dan kesan amalan ini terhadap kesihatan remaja tersebut?*

	<b>Health problem</b> <i>Masalah kesihatan</i>	<b>Effect on health</b> <i>Kesan kepada kesihatan</i>
<b>A</b>	Anorexia nervosa <i>Anoreksia nervosa</i>	Malnutrition <i>Malnutrisi</i>
<b>B</b>	Anorexia nervosa <i>Anoreksia nervosa</i>	Inflammation of the esophagus and tooth decay <i>Radang esofagus dan pereputan gigi</i>
<b>C</b>	Bulimia nervosa <i>Bulimia nervosa</i>	Malnutrition <i>Malnutrisi</i>
<b>D</b>	Bulimia nervosa <i>Bulimia nervosa</i>	Inflammation of the esophagus and tooth decay <i>Radang esofagus dan pereputan gigi</i>

- 18 Diagram 10 shows the structure of a chloroplast.  
*Rajah 10 menunjukkan struktur satu kloroplas.*

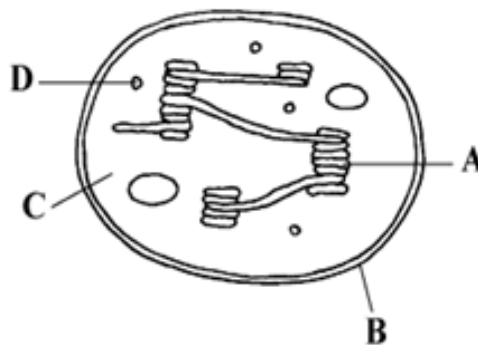


Diagram 10 / *Rajah 10*

Which is the site of light reaction (photolysis of water)?  
*Yang manakah ialah tapak tindak balas cahaya (fotolisis air)?*

- 19 Diagram 11 shows the apparatus set-up to collect the gas released when an aquatic plant, *Hydrilla* sp. is exposed to light from the lamp. The apparatus is placed at a distance of 20cm from the light source. *Rajah 11 menunjukkan susunan radas untuk mengumpul gas yang dibebaskan oleh tumbuhan akuatik, Hydrilla sp. yang didedahkan kepada cahaya daripada mentol. Radas diletakkan pada jarak 20cm daripada sumber cahaya.*

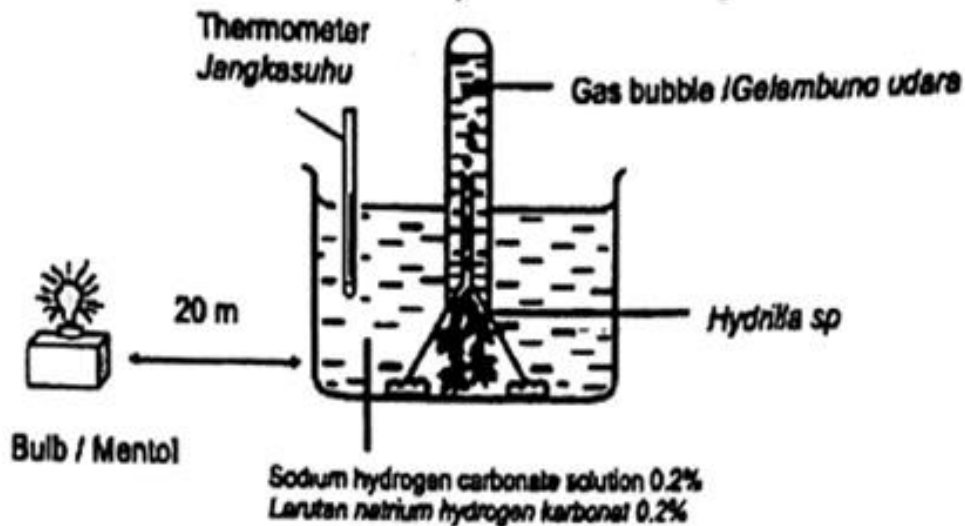
Diagram 11 / *Rajah 11*

Table 1 shows the result of the experiment. *Jadual 1 menunjukkan keputusan eksperimen.*

Distance of light source (cm) <i>Jarak sumber cahaya (cm)</i>	20	25	30	35
Number of bubbles released in 1 minute <i>Bilangan gelembung yang dibebaskan dalam masa 1 minit</i>	15	13	11	9

Table 1 / *Jadual 1*

What conclusion can be made from this experiment?  
*Apakah kesimpulan yang dapat dibuat daripada eksperimen ini?*

- If the distance of the light source decreases, the number of bubbles released in 1 minute will increase  
*Jika jarak sumber cahaya berkurang, bilangan gelembung yang dibebaskan dalam masa 1 minit akan bertambah*
- If the distance of the light source increases, the number of bubbles released in 1 minute increases  
*Jika jarak sumber cahaya bertambah, bilangan gelembung yang dibebaskan dalam masa 1 minit bertambah*
- The rate of photosynthesis increases with a decrease in the intensity of light  
*Kadar fotosintesis bertambah dengan pengurangan keamatan cahaya*
- The rate of photosynthesis is limited by the concentration of carbon dioxide  
*Kadar fotosintesis dihadkan oleh kepekatan karbon dioksida*

- 20** Lactic acid accumulated in an athlete's muscles after taking part in 200m sprint.  
*Asid laktik terkumpul di dalam otot seorang atlet selepas mengambil bahagian dalam 200m lari pecut.*

Which of the following contributes to the situation?

*Antara berikut yang manakah menyumbang kepada situasi tersebut?*

- A.** Aerobic respiration in muscles increases  
*Respirasi aerob di dalam otot meningkat*
  - B.** Aerobic respiration in muscles decreases  
*Respirasi aerob di dalam otot menurun*
  - C.** Anaerobic respiration in muscles increases  
*Respirasi anaerob di dalam otot meningkat*
  - D.** Anaerobic respiration in muscles decreases  
*Respirasi anaerob di dalam otot menurun*
- 21** Diagram 12 shows the respiratory surface of three organisms.  
*Rajah 12 menunjukkan permukaan respirasi bagi tiga organisma..*



Diagram 12  
 Rajah 12

Which of the following is the common adaptation for gaseous exchange in the three respiratory surfaces?

*Antara berikut yang manakah penyesuaian untuk pertukaran gas yang lazim bagi ketiga- tiga permukaan respirasi tersebut?*

- A.** Have large surface areas  
*Mempunyai luas permukaan yang besar*
- B.** Have many branches  
*Mempunyai banyak cabang*
- C.** Covered with blood capillaries  
*Diselaputi kapilari darah*
- D.** Supported by chitin rings

*Disokong oleh gelang kitin*

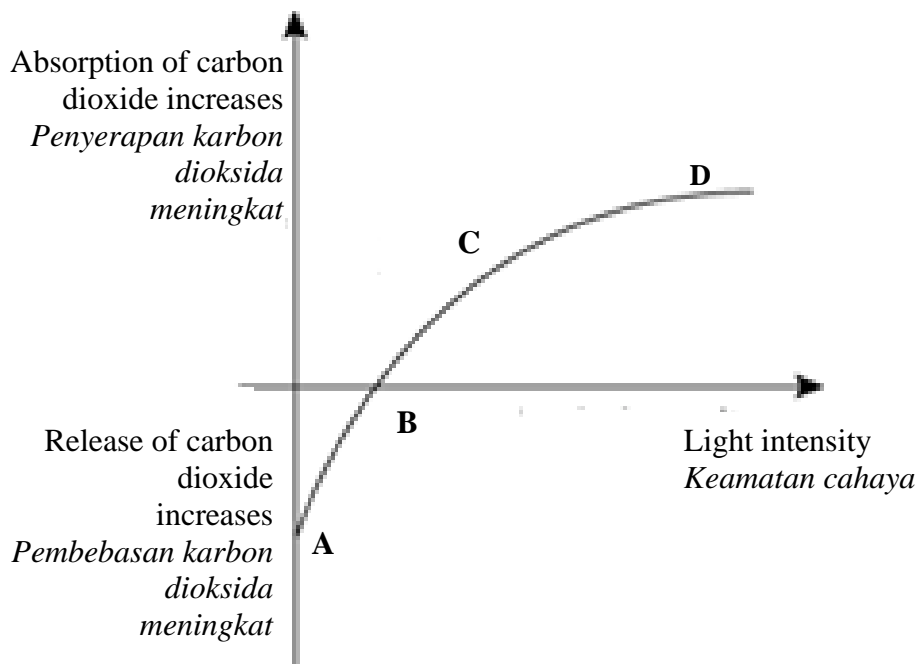
- 22 Which of the following receptors can detect an increase in the concentration of carbon dioxide in the blood?

*Antara reseptor-reseptor berikut, yang manakah dapat mengesan peningkatan karbon dioksida di dalam darah?*

- A. Central chemoreceptors  
*Kemoreseptor pusat*
- B. Central thermoreceptors  
*Termoreseptor pusat*
- C. Peripheral chemoreceptors  
*Kemoreseptor periferi*
- D. Peripheral thermoreceptors  
*Termoreseptor periferi*

- 23 The graph shows the amount of carbon dioxide taken in and produced by plant in different light intensities. Which of the following points, A, B, C or D is the compensation point?

*Graf menunjukkan jumlah karbon dioksida yang diambil dan dihasilkan oleh tumbuhan pada keamatan cahaya yang berlainan. Antara titik A, B, C atau D, yang manakah titik pampasan?*



- 24 Organisms that derive their food or part of their food from other organisms are called ...  
*Organisma yang mendapatkan makanan atau sebahagian daripada makanan daripada organisma lain adalah dipanggil ...*

- A. epiphytes  
*epifit*
- B. epizoites  
*epizoit*
- C. parasites  
*parasit*

D. saprophytes  
saprofit

25 Diagram 13 shows three different zones at a mangrove swamp.  
Rajah 13 menunjukkan tiga zon yang berbeza di paya bakau.

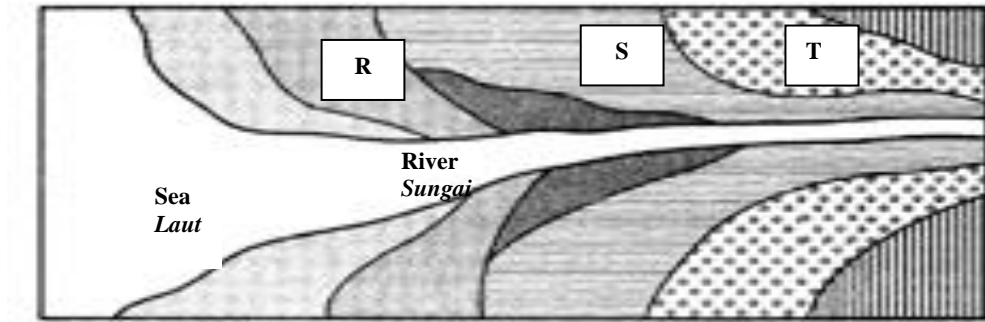


Diagram 13  
Rajah 13

Which types of roots are correctly matched to the dominant mangrove plants in the zones R, S and T?  
Yang manakah jenis akar yang dipadankan dengan betul kepada pokok bakau yang dominan di zon R, S dan T?

	Zone R Zon R	Zone S Zon S	Zone T Zon T
A.			
B.			
C.			
D.			

- 26 Diagram 14 shows the results of a study on distribution of two types of plants, species P and species Q, in a bushes area. A line transect has been determined and divided into 10 square quadrats. The length of each quadrat is 2 metres.

Rajah 14 menunjukkan keputusan bagi satu kajian taburan bagi dua jenis tumbuhan, spesies P dan spesies Q, dalam satu kawasan belukar. Satu transek garisan telah ditentukan dan terbahagi kepada 10 kuadrat segi empat sama. Panjang sisi setiap kuadrat ialah 2 meter.

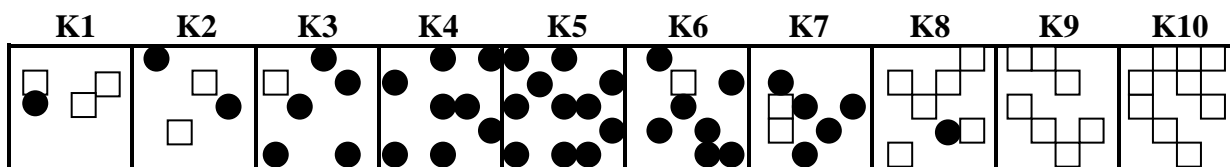


Diagram 14  
Rajah 14

Key / Kekunci:

- 1 plant of species P  
1 pokok spesies P  
● 1 plant of species Q  
1 pokok spesies Q

What is the estimated density of species Q in the area?  
Apakah anggaran kepadatan spesies Q di kawasan itu?

- A.  $0.78 \text{ m}^{-2}$   
B.  $1.00 \text{ m}^{-2}$   
C.  $1.25 \text{ m}^{-2}$   
D.  $2.00 \text{ m}^{-2}$
- 27 The following information shows the interaction that occurs in the alimentary canal of termites.  
Maklumat berikut menunjukkan interaksi yang berlaku dalam salur alimentari anai-anai.

*Trichonympha sp.* helps to produce cellulase to digest cellulose in the wood which is consumed by termites into simple sugar.  
*Trichonympha sp.* membantu untuk menghasilkan selulase untuk mencernakan selulosa dalam kayu yang telah dimakan oleh anai-anai kepada gula ringkas.

Then, the simple sugar is used by the termites and *Trichonympha sp.*  
Kemudian, gula ringkas itu digunakan oleh anai-anai dan *Trichonympha sp.*

What is the type of interaction occurs between *Trichonympha sp.* and the termites?  
Apakah jenis interaksi yang berlaku antara *Trichonympha sp.* dan anai-anai?

- A. Mutualism /*Mutualisme*  
B. Parasitism /*Parasitisme*  
C. Saprophytism /*Saprotifisme*

**D. Commensalism /Komensalisme**

- 28** Table 2 shows the readings of the Air Pollution Index (API) of four places.  
*Jadual 2 menunjukkan bacaan Indeks Pencemaran Udara (IPU) bagi empat tempat.*

<b>Place</b> <i>Tempat</i>	<b>API Reading</b> <i>Bacaan IPU</i>	<b>Status</b> <i>Status</i>
Sri Aman	420	Hazardous <i>Berbahaya</i>
Kuching	246	Very unhealthy <i>Sangat tidak sihat</i>
Sarikei	228	Very unhealthy <i>Sangat tidak sihat</i>
Samarahan	219	Very unhealthy <i>Sangat tidak sihat</i>

Recorded at 10.00am, 20 September 2019  
*Direkodkan pada 10.00 pagi, 20 September 2019*





Table 2  
*Jadual 2*

Based on the information, what is the long-term effect of the air quality to human beings?  
*Berdasarkan maklumat itu, apakah kesan jangka masa panjang kualiti udara tersebut kepada manusia?*

- A.** Flu  
*Selesema*
  - B.** Blurry vision  
*Penglihatan kabur*
  - C.** Skin problem  
*Masalah kulit*
  - D.** Lungs disease  
*Penyakit peparu*
- 29** Which of the following phenomenon is directly related to chlorofluorocarbon?  
*Antara berikut, fenomena yang manakah berkait secara langsung dengan klorofluorokarbon?*
- A.** Haze  
*Jerebu*
  - B.** Acid rain  
*Hujan asid*
  - C.** Global warming  
*Pemanasan global*
  - D.** Thinning of ozone layer  
*Penipisan lapisan ozon*

30 Which of the following is correctly matched for the cellular component in the blood and its function?

*Antara berikut, yang manakah dipadankan dengan betul bagi komponen sel dalam darah dan fungsinya?*

	<b>Cellular component in the blood</b> <i>Komponen sel dalam darah</i>	<b>Function</b> <i>Fungsi</i>
A		Transport <i>Pengangkutan</i>
B		Transport <i>Pengangkutan</i>
C		Defence <i>Pertahanan</i>
D		Defence <i>Pertahanan</i>



- 31** Diagram 15 shows the condition of a paralysed patient's leg that cannot move for a long period of time.

*Rajah 15 menunjukkan keadaan kaki seorang pesakit lumpuh yang tidak boleh bergerak dalam jangka masa lama.*



Diagram 15  
*Rajah 15*

Which statement best describes about the condition of the leg?

*Pernyataan manakah yang terbaik menerangkan keadaan kaki tersebut?*

- A** Clogged lymph nodes  
*Nodus limfa tersumbat*
- B** The lymphatic valves unable to close tightly  
*Injap limfa tidak tertutup rapat*
- C** No muscle contraction for lymphatic fluid to flow  
*Tiada pengecutan otot untuk pengaliran bendalir limfa*
- D** Less filtration in kidney causes water accumulation in the body  
*Kurang penurasan di ginjal menyebabkan air terkumpul dalam badan*

- 32 Diagram 16 shows a pamphlet on HPV vaccination.  
*Rajah 16 menunjukkan satu risalah tentang pelalian HPV.*



Diagram 16  
*Rajah 16*

What is the characteristic of this immunisation?  
*Apakah ciri keimunan ini?*

- A. Involves injection of antibody  
*Melibatkan suntikan antibodi*
- B. Involves injection of serum  
*Melibatkan suntikan serum*
- C. The immunity is temporary  
*Keimunan adalah sementara*
- D. The immunity is long term  
*Keimunan jangka masa panjang*

- 33 Diagram 17 shows structure of a phloem.  
Rajah 17 menunjukkan struktur floem.

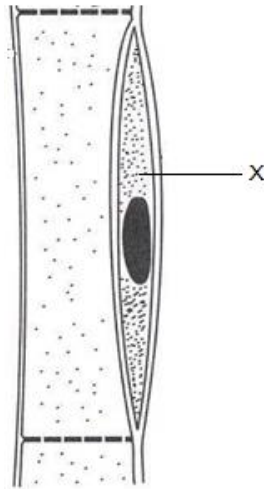


Diagram 17 / Rajah 17

What is X?  
Apakah X?

- A Companion cell  
*Sel rakan*
- B Sieve plate  
*Plat tapis*
- C Sieve tube  
*Tiub tapis*
- D Tracheid  
*Trakeid*
- 34 Which of the following vertebrae is correctly matched to the part of the body?  
Manakah antara vertebra berikut dipadankan dengan betul dengan bahagian badan?

	<b>Vertebrae</b> <i>Vertebra</i>	<b>Part of body</b> <i>Bahagian badan</i>
A	Lumbar <i>Lumbar</i>	Waist <i>Pinggang</i>
B	Sacrum <i>Sakrum</i>	Neck <i>Leher</i>
C	Cervical <i>Serviks</i>	Chest <i>Dada</i>
D	Thoracic <i>Toraks</i>	Buttock <i>Punggung</i>

35 Which of the following bones will form a pectoral girdle?  
*Manakah antara tulang-tulang berikut akan membentuk lengkungan pektoral?*

- I Clavicle  
*Klavikel*
- II Humerus  
*Humerus*
- III Scapula  
*Skapula*
- IV Ulna and Radius  
*Ulna dan Radius*

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

36 Diagram 18 shows a type of plant tissue.  
*Rajah 18 menunjukkan sejenis tisu tumbuhan.*

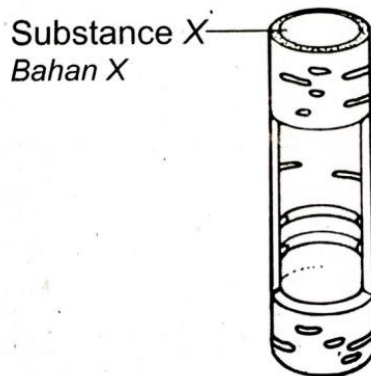


Diagram 18  
*Rajah 18*

What is the importance of the thickening of substance X to the plant tissue?  
*Apakah kepentingan penebalan bahan X terhadap tisu tumbuhan itu?*

- A. To give turgidity to the tissues  
*Untuk memberikan kesegahan kepada tisu*
- B. To transfer water and mineral salts  
*Untuk memindahkan air dan garam mineral*
- C. To transfer products of photosynthesis  
*Untuk memindahkan hasil fotosintesis*

- D.** To give support and mechanical strength  
*Untuk memberikan sokongan dan kekuatan mekanikal*
- 37** What is the role of acetylcholine in the nervous system?  
*Apakah fungsi asetilkolina di dalam sistem saraf?*
- A.** Speeds up the transmission of nerve impulses  
*Meningkatkan kelajuan penghantaran impuls saraf*
- B.** Receives information from other neurones  
*Menerima maklumat daripada neuron lain*
- C.** Transmit impulse from the cell body to other parts of the neurone  
*Menghantar impuls daripada badan sel kepada bahagian lain neuron*
- D.** Facilitates the transmission of nerve impulses in one direction  
*Membantu penghantaran impuls saraf dalam satu arah.*
- 38** Diagram 19 shows the human endocrine system  
*Rajah 19 menunjukkan sistem endokrin manusia.*

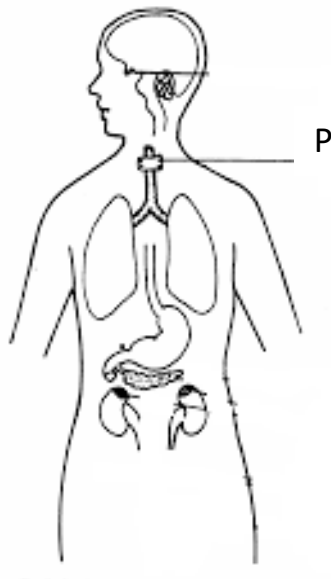


Diagram 19  
*Rajah 19*

What is the hormone secreted by P?  
*Apakah hormon yang dirembeskan oleh P?*

- A.** Insulin  
*Insulin*
- B.** Oxytocin  
*Oksitosin*
- C.** Thyroxine  
*Tiroksina*
- D.** Adrenaline  
*Adrenalin*

- 39 Diagram 20 shows a human nephron.  
Rajah 20 menunjukkan satu nefron manusia.

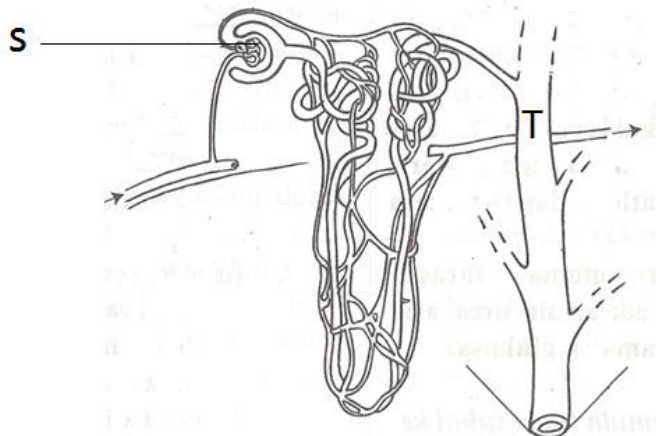


Diagram 20  
Rajah 20

What are the processes that occur at S and T?  
Apakah proses yang berlaku dalam S dan T?

	<b>S</b>	<b>T</b>
<b>A</b>	Diffusion <i>Resapan</i>	Active transport <i>Pengangkutan aktif</i>
<b>B</b>	Ultrafiltration <i>Ultraturasan</i>	Diffusion <i>Resapan</i>
<b>C</b>	Active transport <i>Pengangkutan aktif</i>	Reabsorbtion <i>Penyerapan semula</i>
<b>D</b>	Ultrafiltration <i>Ultraturasan</i>	Reabsorbtion <i>Penyerapan semula</i>

- 40 What is the effect of auxin on the ovary of a flower which has not been fertilised?  
Apakah kesan auksin ke atas ovari bunga yang belum mengalami persenyawaan?

- A.** The ovary becomes a fruit without seeds  
*Ovari membentuk buah tanpa biji*
- B.** The ovary becomes a fruit with seeds  
*Ovari membentuk buah dengan biji*
- C.** The ovary will die  
*Ovari akan mati*
- D.** The flower falls off  
*Bunga akan gugur*

- 41 Diagram 21 shows a cell that is produced from the process of gamete formation.  
Rajah 21 menunjukkan satu sel hasil dari proses pembentukan gamet.



Diagram 21  
Rajah 21

Where does formation of cell occur?  
Di manakah sel ini terbentuk?

- A Vas deferens  
*Vas deferens*
- B Seminiferous tubules  
*Tubul seminiferus*
- C Seminal vesicles  
*Vesikel semen*
- D Scrotum  
*Skrotum*
- 42 The menstrual cycle is controlled by hormones secreted by the pituitary and ovarian glands.  
Kitar haid dikawal oleh hormon yang dirembeskan oleh kelenjar pituitari dan ovari.

Which of the following is true about the role of hormones in the menstrual cycle?  
Antara berikut, manakah yang benar berkenaan peranan hormon dalam kitar haid?

	<b>Hormone</b> <i>Hormon</i>	<b>Function</b> <i>Peranan</i>
I	Luteinising hormone (LH) <i>Hormon peluteinan (LH)</i>	Stimulate ovulation <i>Merangsang pengovulan</i>
II	Oestrogen hormone <i>Hormon estrogen</i>	Inhibit secretion of luteinising hormone <i>Merencat perembesan hormon peluteinan</i>
III	Follicle stimulating hormone(FSH) <i>Hormon perangsang folikel (FSH)</i>	Thickens the endometrium wall <i>Menebal dinding endometrium</i>
IV	Progesterone hormone <i>Hormon progesteron</i>	Prevent the secretion of FSH and LH by pituitary gland. <i>Menghalang perembesan FSH dan LH oleh kelenjar pituitari</i>

- A. I dan II
- B. II dan III
- C. III dan IV

## D. I dan IV

- 43 Diagram 22 shows the process of double fertilization that takes place in the ovule.  
*Rajah 22 menunjukkan proses persenyawaan ganda dua yang berlaku di ovul.*

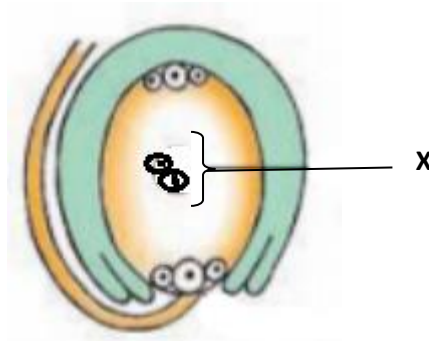


Diagram 22  
*Rajah 22*

Name the structure that will be formed from the part labeled X during fruit formation.  
*Namakan struktur yang akan terbentuk dari bahagian berlabel X semasa pembentukan buah.*

- A. Endosperm tissue  
*Tisu endosperma*
- B. Embryo  
*Embrio*
- C. Suspensor  
*Suspenser*
- D. Funicle  
*Funikel*
- 44 What is the shape of the growth curve for a crab?  
*Apakah bentuk lengkungan pertumbuhan bagi seekor ketam?*
- A. Sigmoid  
*Sigmoid*
- B. Bell  
*Loceng*
- C. Step  
*Tangga*
- D. Discrete  
*Diskrit*



- 45 Diagram 23 shows the inheritance of the dimple trait in humans. Dimple is the dominant trait represented by D while non-dimple is the recessive trait represented by d.  
*Rajah 23 menunjukkan perwarisan trait berlesung pipit pada manusia. Berlesung pipit adalah trait dominan yang diwakili oleh D manakala tanpa lesung pipit adalah trait resesif yang diwakili oleh d.*

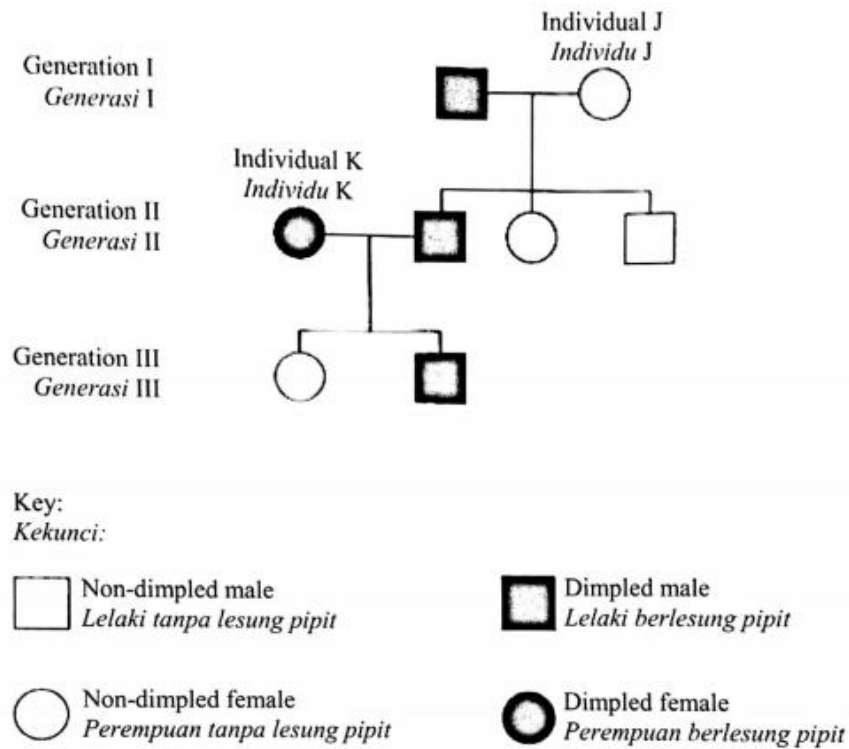


Diagram 23  
*Rajah 23*

Which of the following are genotypes for individual J and individual K?  
*Antara berikut yang manakah adalah genotip-genotip bagi individu J dan individu K?*

	<b>Individual J</b> <i>Individu J</i>	<b>Individual K</b> <i>Individu K</i>
<b>A</b>	Dd	Dd
<b>B</b>	dd	DD
<b>C</b>	dd	Dd
<b>D</b>	DD	dd

- 46 Diagram 24 shows the karyotype of an individual with a genetic disease.  
*Rajah 24 menunjukkan kariotip seorang individu yang menghidap penyakit baka.*

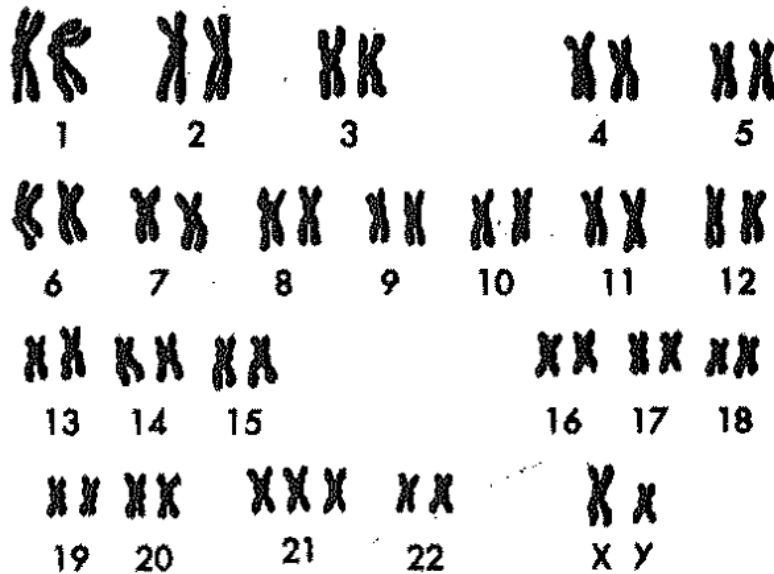


Diagram 24  
*Rajah 24*

Which of the following has the karyotype shown?

*Antara berikut yang manakah mempunyai kariotip seperti yang ditunjukkan?*

- A. Female with slanted eyes, broad face, short neck and broad protruded tongue.  
*Perempuan bermata sepet, muka lebar, leher pendek dan lidah lebar serta terjelir.*
- B. Male with slanted eyes, broad face, short neck and broad protruded tongue.  
*Lelaki bermata sepet, muka lebar, leher pendek dan lidah lebar serta terjelir.*
- C. Female with a short neck, mental retarded and sterile.  
*Perempuan berleher pendek, terencat akal dan mandul.*
- D. Male with a short neck, mental retarded and sterile.  
*Lelaki berleher pendek, terencat akal dan mandul.*

- 47 Diagram 25 shows parts of a DNA molecule.  
*Rajah 25 menunjukkan sebahagian daripada molekul DNA.*

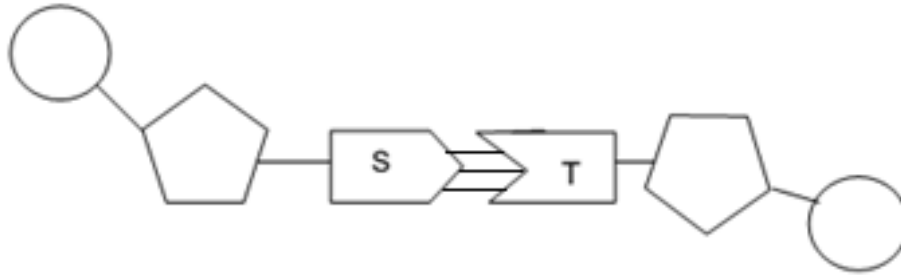


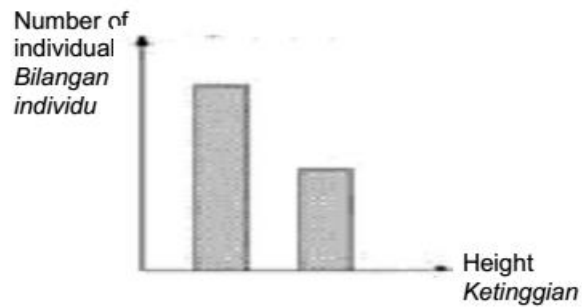
Diagram 25  
*Rajah 25*

Which pair of nitrogenous bases represent S and T?  
*Manakah pasangan bes bernitrogen yang mewakili S dan T?*

	<b>S</b>	<b>T</b>
<b>A</b>	Cytosine / <i>Sitosina</i>	Adenine / <i>Adenina</i>
<b>B</b>	Adenine / <i>Adenina</i>	Guanine / <i>Guanina</i>
<b>C</b>	Thymine / <i>Tiamina</i>	Cytosine / <i>Sitosina</i>
<b>D</b>	Guanine / <i>Guanina</i>	Cytosine / <i>Sitosina</i>

- 48 Which of the following graphs correctly shows the variation of height?  
 Manakah antara graf- graf berikut menunjukkan variasi ketinggian dengan betul?

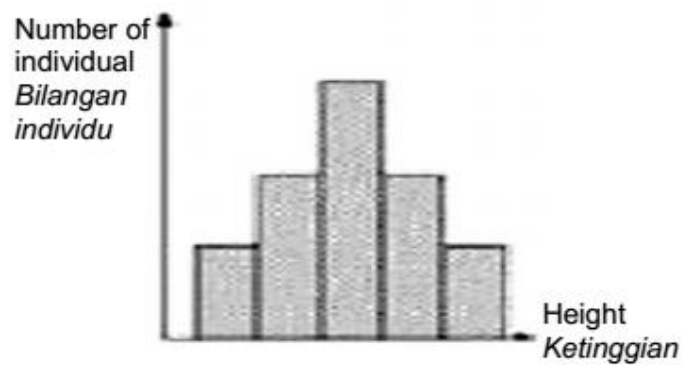
A



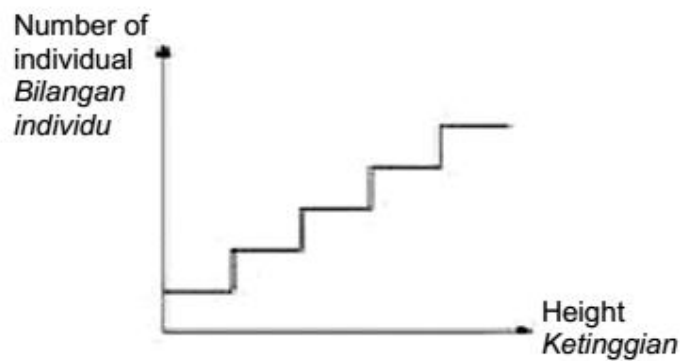
B



C



D



- 49 The following information is about individuals P and Q.  
Maklumat berikut adalah mengenai individu P dan Q.

- P : Presence of dimple / *Ada lesung pipit*
- Q: No dimple / *Tiada lesung pipit*

Which of the following factors causes differences in traits between the two individuals?  
*Antara faktor berikut, yang manakah menyebabkan perbezaan trait antara dua individu tersebut?*

- A. Genetics / *Genetik*  
 B. Diet / *pemakanan*  
 C. Hormone / *Hormon*  
 D. Environment / *Persekitaran*
- 50 Diagram 26 shows a process that causes genetic variation.  
*Rajah 26 menunjukkan proses yang menyebabkan variasi genetik.*

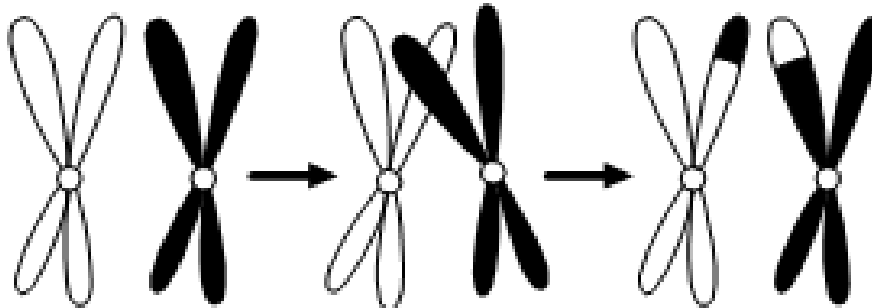


Diagram 26  
*Rajah 26*

Which of the following is caused by the above process?  
*Manakah antara berikut disebabkan oleh proses di atas?*

- A. Night blindness  
*Rabun malam*  
 B. Colour blindness  
*Buta warna*  
 C. Down's syndrome  
*Sindrom Down*  
 D. Klinefelter's syndrome  
*Sindrom Klinefelter*

**END OF QUESTION PAPER**  
**KERTAS SOALAN TAMAT**