

KOLEKSI SOALAN SPM PERCUBAAN NEGERI
FORM 5 BIOLOGY CHAPTER 2: LOCOMOTION AND SUPPORT

QUESTION 1 - 2014 PAHANG

Diagram 3.1 shows movement of earthworm and a fish in different habitats.

Rajah 3.1 menunjukkan pergerakan cacing tanah dan ikan dalam habitat yang berbeza.

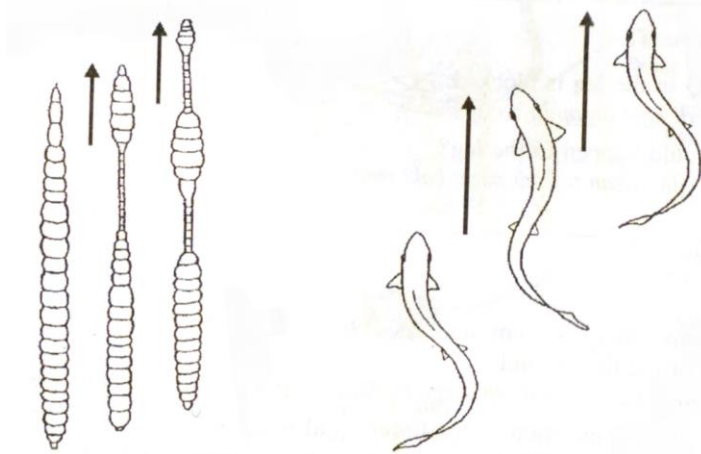


Diagram 3.1
Rajah 3.1

- (i) Name the muscles of both organisms that involved in movement.
Namakan otot yang terlibat dalam pergerakan dalam kedua-dua organisma tersebut.

Earthworm/*Cacingtanah*

Ikan/ *Fish*

[2 marks]

- (ii) Name the type of skeleton for both organisms.
Namakan jenis rangka kedua-dua organisma tersebut.

Earthworm/*Cacing tanah*

Ikan/ *Fish*

[2 marks]

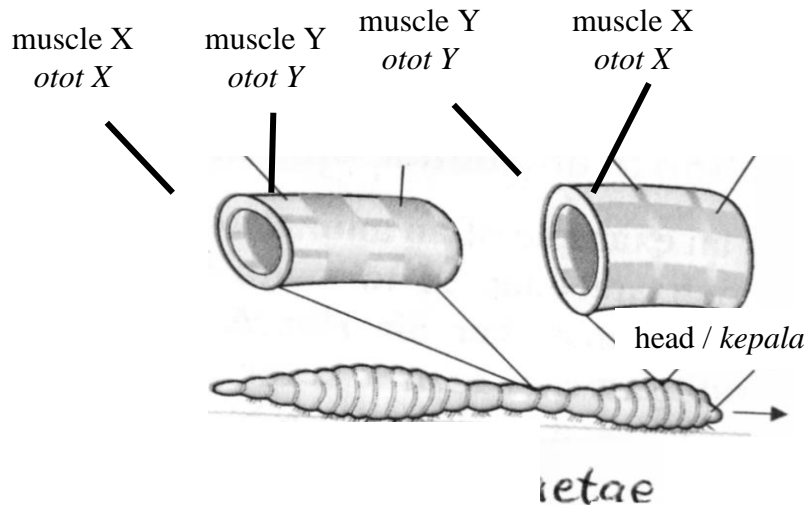


Diagram 3.2
Rajah 3.2

Diagram 3.2 shows the muscles of earthworm involve in locomotion.

Rajah 3.2 menunjukkan otot-otot cacing tanah yang terlibat dalam pergerakan.

(a) Based on Diagram 3.2 describe the mechanism of locomotion in the earthworm.

Berdasarkan Rajah 3.2 terangkan mekanisme pergerakan cacing tanah.

[2 marks]

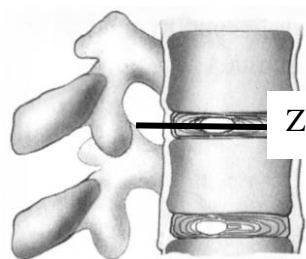


Diagram 3.3
Rajah 3.3

Diagram 3.3 shows part of vertebral column showing structure Z.

Rajah 3.3 menunjukkan sebahagian daripada turus vertebra bersama struktur Z.

(b) What is the effect if structure labelled Z absent in the vertebral column?

Apakah kesan jika struktur berlabel Z tiada dalam turus vertebra?

[2 marks]



Diagram 3.4
Rajah 3.4

Diagram 3.4 shows the health problem because of impaired musculoskeletal system and it can be inherited.

Rajah 3.4 menunjukkan masalah kesihatan yang boleh diwarisi akibat sistem otot rangka yang merosot.

(c) Describe briefly the health problem.

Terangkan secara ringkas masalah kesihatan tersebut.

[2 marks]

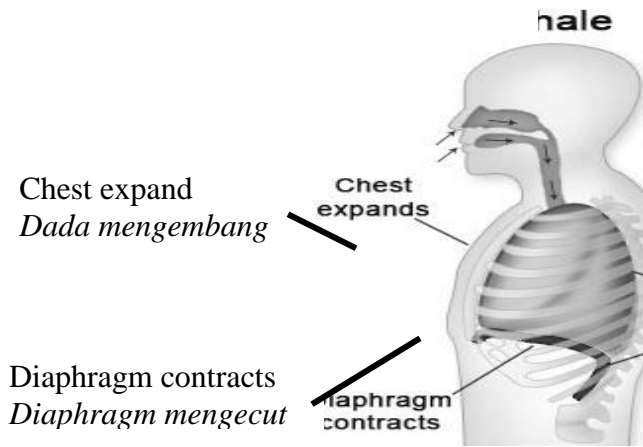


Diagram 3.5
Rajah 3.5

Diagram 3.5 shows the process of inhalation.

Rajah 3.5 menunjukkan proses menarik nafas.

Diaphragm is the dome-shaped sheet of muscle that involves in the breathing process. If an accident occurs and causes the ribs stab to the diaphragm, explain the possibility effects to a person.

Diafragma merupakan kepingan otot berbentuk kubah yang terlibat dalam proses pernafasan. Jika seseorang terlibat dalam kemalangan di mana tulang rusuknya telah tercucuk kepada diafragma, terangkan kesan yang mungkin berlaku.

[2 marks]

Suggested Answer

a.i	Earthworm: longitudinal (muscle) and circular (muscle) Fish: myotome
.ii	Earthworm: hydrostatic (skeleton) Fish: endoskeleton
b	<u>Set 1</u> L1: when circular muscle/ muscle Y contract, longitudinal muscle / muscle X relaxes L2: earthworm becomes thinner and longer <u>Set 2</u> S1: when longitudinal muscle / muscle X contract, circular muscle / muscle Y relaxes S2: earthworm becomes thicker and shorter

Any one set

c	F1: Z is intervertebral disc E1: the vertebral column can't move / shock is not absorbed // increase friction (between vertebral) leads to back pain
d	F1: is caused by progressive degeneration and weaknesses of skeletal muscle P1: because of mutated gene on X chromosome P2: so mainly affects boys
e	P1: Damage / ruin the diaphragm P2: diaphragm looses / less elasticity P3: volume of thoracic cavity / air pressure cannot be controlled P4: difficulties in breathing

QUESTION 2 - PAHANG JUJ

Diagram 7.1 shows three different types of animals.

Rajah 7.1 menunjukkan tiga jenis haiwan yang berbeza.

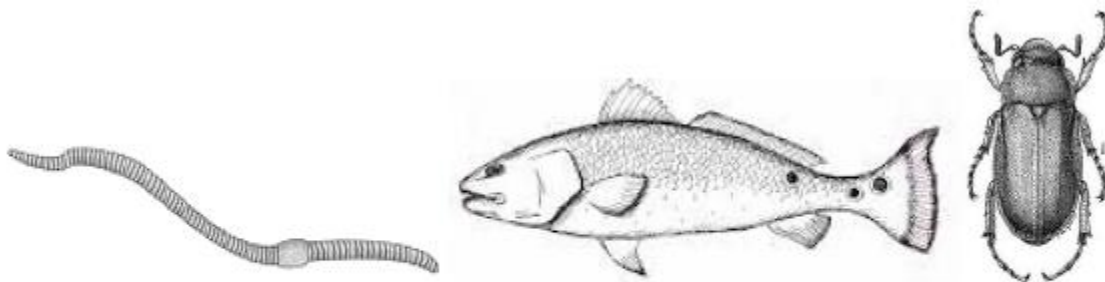


Diagram 7.1

Rajah 7.1

(a) Support in humans and animals is provided by a framework called a skeleton. Based on the above diagram, explain the skeleton.

Sokongan dalam manusia dan haiwan dibantu melalui kerangka yang dinamakan rangka. Berdasarkan rajah di atas, terangkan tentang rangka tersebut.

[6 marks / markah]

(b)

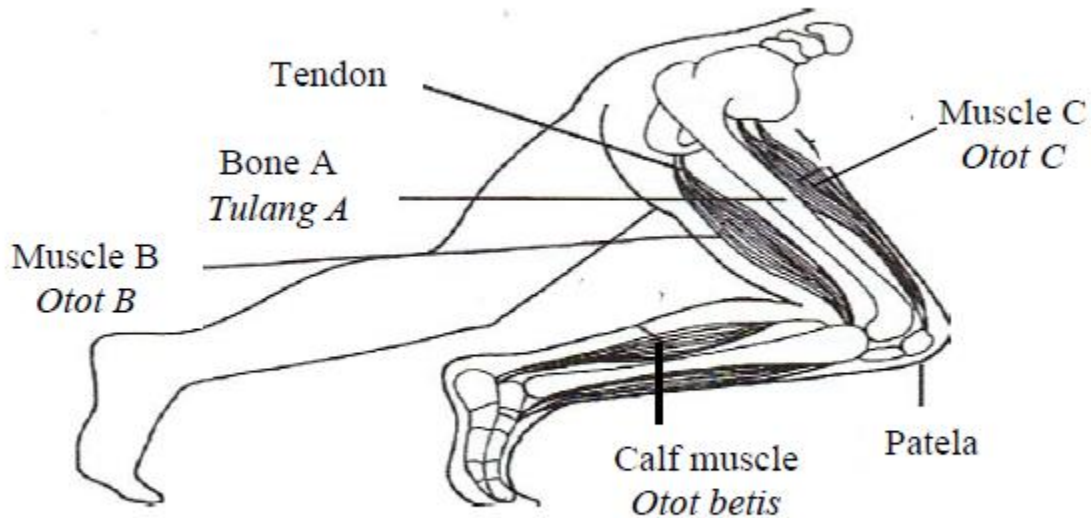


Diagram 7.2
Rajah 7.2

[6 marks / markah]

Explain how movement shown in Diagram 7.2 is brought.

Terangkan bagaimana pergerakan seperti yang ditunjukkan dalam Rajah 7.2 dihasilkan.



Diagram 7.3
Rajah 7.3

(c) High heels should not be used for walking. Describe briefly why wearing proper shoes can prevent foot problems.

Kasut tumit tinggi tidak sepatutnya digunakan untuk berjalan. Terangkan secara ringkas mengapa kasut yang sesuai boleh mengelakkan masalah tapak kaki.

[4marks / markah]

- (d) Diagram 7.4 shows xylem vessels and sclerenchyma tissues in plant.
Rajah 7.4 menunjukkan salur xilem dan tisu sklerenkima dalam tumbuhan.

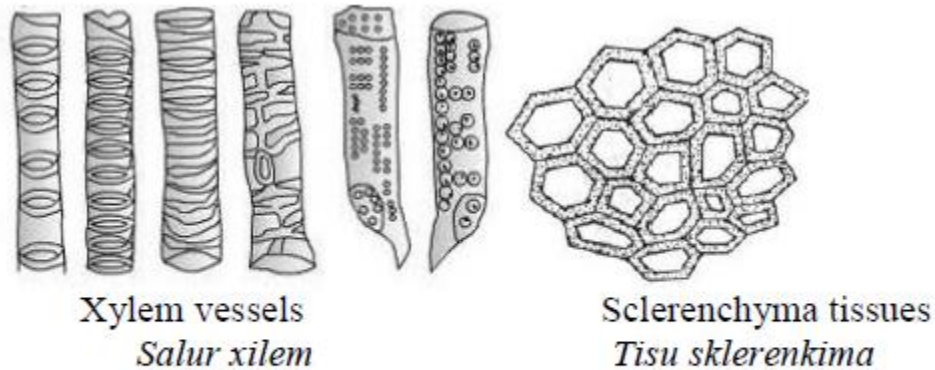


Diagram 7.4
Rajah 7.4

Like humans and animals, plants need support. Hence, it needs a strong stem and branches to support its weight. Explain how support in terrestrial plants is achieved through tissue modifications.

Seperti manusia dan haiwan, tumbuh-tumbuhan memerlukan sokongan. Maka, tumbuhan memerlukan batang yang kuat dan ranting untuk menyokong berat mereka. Terangkan bagaimana sokongan tumbuhan darat diperolehi melalui pengubahsuaian tisu.

[4marks / markah]

Suggested Answer

- | | |
|-----|--|
| (a) | Cacing tanah
C1 - rangka hidrostatik
C2 - rongga badan dipenuhi bendalir
Ikan
F1 - rangka dalam / endoskeleton
F2 – kerangka tetap yang terdiri daripada tulang dan rawan
F3 - tempat perlekatan otot
Serangga
S1 - rangka luar / eksoskeleton |
|-----|--|

	<p>S2 - struktur yang tetap/tidak berubah S3 – melindungi struktur dalaman daripada musnah</p>
(b)	<p>P1 – kaki dibengkokkan P2 – otot B ialah bicep femoris dan otot C ialah kuadrisep femoris P3 – (otot B / bicep femoris) mengecut dan (otot C / kuadrisep femoris) mengendur P4 - otot betis mengecut dan membolehkan tumit diangkat P5 - tulang A ialah femur P6 - (tulang A / femur) menyokong berat badan P7 - daya dipindahkan daripada otot ke tulang melalui tendon P8 - tendon bersifat tidak kenyal / menghubungkan otot kepada tulang P9 – sendi engsel membenarkan pergerakan pembengkokan kaki / gerakan satu arah</p>
(c)	<p>P1 – kasut tumit tinggi menyebabkan berat badan bertumpu ke atas tapak kaki bahagian depan P2 – (ini) boleh mencederakan tisu lembut / sendi / tulang tumit // tisu otot / betis menjadi regang // tisu tapak kaki menjadi bengkak P3 – kasut yang sesuai mempunyai tapak yang kuat / fleksibel / berkusyen P4 – (ini) mengelakkan kaki daripada permukaan yang keras</p>
(d)	<p>Tumbuhan herba P1 – kesegahan sel parenkimia kolenkimia P2 – tekanan segah bendalir dalam vakuol P3 – penebalan dinding sel oleh selulosa / pektin P4 – (dan ini) memberikan sokongan mekanikal Tumbuhan berkayu K1 – mempunyai tisu sklerenkemia / xilem yang dinding berlignin // fiber yang panjang, lurus dan nipis // sclereids yang pendek, bulat dan tiada bentuk tetap K2 – trakeid mempunyai dinding yang berlignin K3 – tumbesaran sekunder membentuk xylem sekunder / kayu Tumbuhan akuatik A1 – tisu aerenkimia menyebabkan tumbuhan ringan A2 – menghasilkan ruang udara dalam batang A3 – pundi udara menyebabkan tumbuhan terapung A4 – akar serabut yang memerangkap gelembung udara Tumbuhan-tumbuhan lain L1 – akar banir tumbuh dari bahagian batang sebelah bawah pada pokok paya bakau L2 – sulur paut (pada hujung daun) melilit pada penyokong L3 – batang berduri (seperti pokok ros) melekat pada penyokong</p>

QUESTION 3 - 2014 JOHOR BATU PAHAT

(a) Diagram 7.1 and 7.2 shows the different types of joints.

Rajah 7.1 dan Rajah 7.2 menunjukkan jenis sendi yang berbeza.

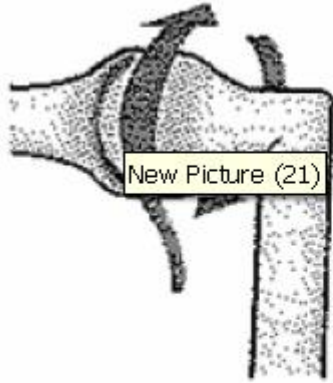


Diagram 7.1
Rajah 7.1

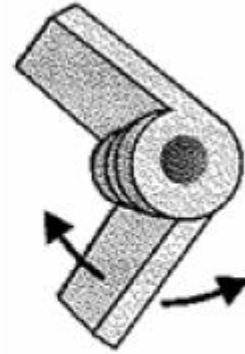


Diagram 7.2
Rajah 7.2

Compare the joint in Diagram 1.1 and Diagram 7.2.
Bandingkan sendi dalam Rajah 7.1 dan Rajah 7.2

[5marks]

(b) Diagram 7.3 shows different positions of forearm during a movement.

Rajah 7.3 menunjukkan kedudukan yang berlainan bagi lengan dalam satu pergerakan

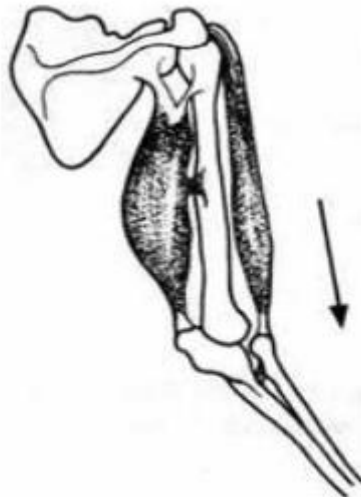


Diagram 7.3
Rajah 7.3

Explain the action of the muscles which cause the movement of the forearm in Diagram 7.3

7.3. Terangkan tindakan otot-otot yang menyebabkan pergerakan lengan dalam Rajah 7.3.

[5marks]

(c) Diagram 7.4 show a osteoarthritis.

Rajah 7.4 menunjukkan pesakit osteoarthritis



Explain the causes and effect of osteoarthritis

Terangkan punca dan kesan osteoarthritis

[5marks]

(d) Diagram 7.5 shows locomotion in a grasshopper.
Rajah 7.5 menunjukkan pergerakan seekor belalang.

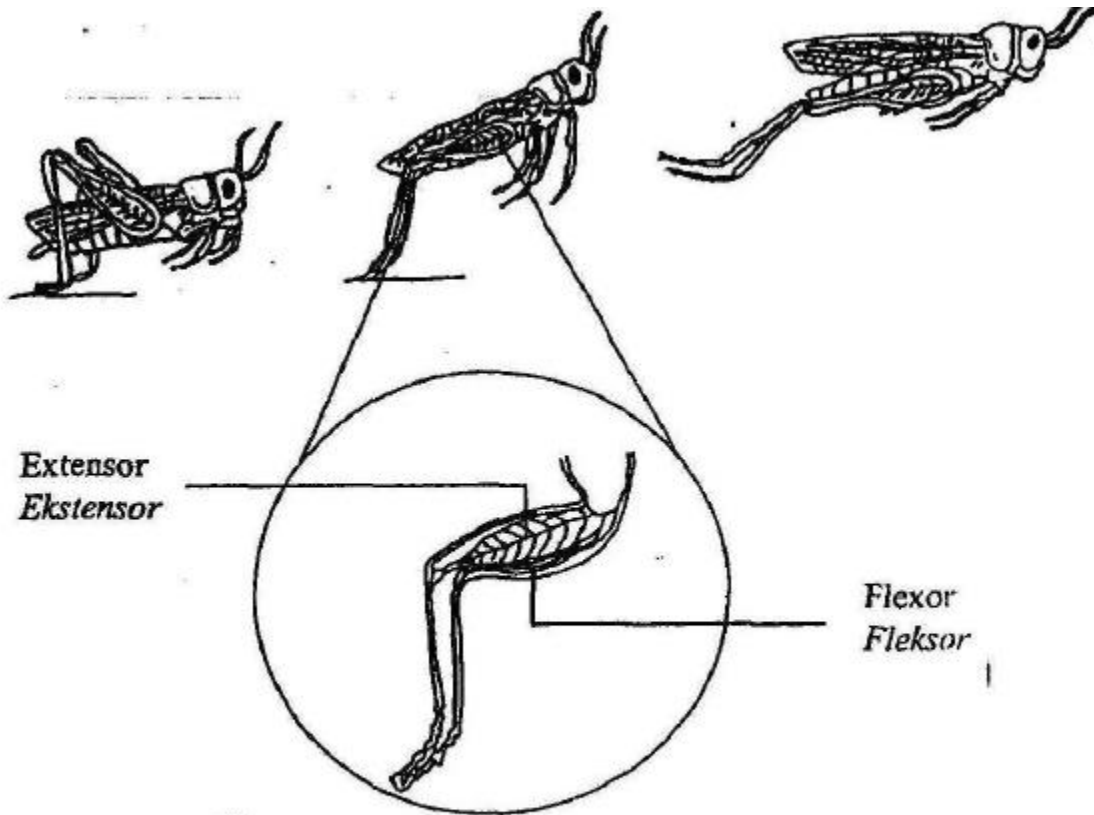


Diagram 7.5
Rajah 7.5

Explain the action of the leg muscle during jumping.
Terangkan tindakan otot kaki semasa melompat.

[5marks]

Suggested Answer

(a)	<p>Comparison hinge joint (H) and ball socket joint (B).</p> <p>Similarities:</p> <p>F1: Both joint H and joint B has a cavity filled with synovial fluid//lined with synovial membrane.</p> <p>P1: Synovial fluid acts as lubricant to reduce friction between bones// absorbs shock of the movement</p> <p>F2: The end surfaces of the humerus bone of joint H and joint B are covered with cartilage.</p> <p>P2: To protect the bone/ reduce friction between the bones.</p> <p>F3 Both joint H and B are connected with ligaments.</p> <p>P3: to absorb shock// reinforce/ strengthen the articulation of bones/ joint //prevent dislocation of joint</p> <p>Differences:</p> <p>D1: Joint H allows the movement of bones in one plane/ direction while joint B allows rotational movement of bones in all directions</p> <p>D2: Joint H is the point where the distal end of humerus articulates with the ulna and radius while joint B is the point where proximal end of humerus articulates with the scapula</p>
(b)	<p>Bending of Forearm</p> <p>F1 The action biceps muscles and triceps muscles are antagonistics</p> <p>P1: When biceps muscle contracts,</p> <p>P2: the triceps muscle relaxes,</p> <p>P3: The tendons transmit the pulling force produced by the contraction to the radius</p> <p>P4: resulting in the bending of elbow joint// the forearm moves upwards</p>
(c)	<p>P1 : Arthritis is a skeletal disorder that involve inflammation of the joints.</p> <p>P2 : The joint become swollen, stiff and painful.</p> <p>P3 : One type of arthritis is called osteoarthritis.</p> <p>P4 : Osteoarthritis is part of the ageing process, and is caused by wear and tear of the cartilage inside certain joints.</p> <p>P5 : The ageing process may also result in a decreases production of synovial fluid in the joint.</p> <p>P6 : If treatment fails to relieve the pain, a surgeon can replace the damaged joints with artificial ones made of plastic or metal.</p>
(d)	<p>P1: When the flexor muscle relax</p> <p>P2: the extensor muscle contract</p> <p>P3 the leg jerk backwards</p> <p>P4: propelling the grasshopper forwards and</p> <p>P5: upwards into the air</p>

QUESTION 4 - 2014 TERENGGANU

Diagram 4 shown a part of the human body limb that involved in movement.

Rajah 4 menunjukkan sebahagian daripada anggota badan manusia yang terlibat dalam pergerakan.

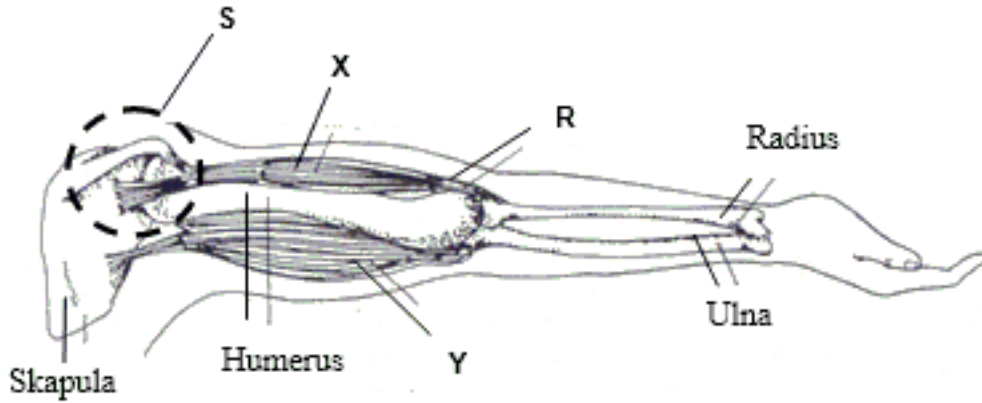


Diagram 4 // *Rajah 4*

a) Name the structure tissue R and the type of joint S

Namakan struktur tisu R dan jenis sendi S

(i) R tissue / *Tisu R*:

(ii) Type of joint S / *Jenis sendi S*:

[2 marks]

b) Explain the function of X muscle, Y muscle and structure R in produced the limb position shows in Diagram 4.

Terangkan peranan otot X, otot Y dan R dalam menghasilkan keadaan anggota seperti dalam Rajah 4.

[3 marks]

c) Explain why muscle X and Y must work in pair to produce the movement.

Terangkan mengapa otot X dan Y mesti bekerja dalam pasangan bagi menghasilkan pergerakan.

[2 marks]

d) Based on Diagram 4, explain two importance of skeletal part in movement.

Berdasarkan Rajah 4, terangkan dua kepentingan bahagian rangka tersebut dalam pergerakan

[2 marks]

e) Explain what happened to the movement of arm if the tissue R is torn.
 Terangkan apakah yang berlaku kepada pergerakan tangan jika tisu R terkoyak.

[3 marks].

Suggestion Answers

(a)	R : Tendon S : Ball and socket joint
(b)	F : Muscle X and muscle Y act as an antogonistic pair P1 : Muscle Y / trisepts contract while muscle X / bisepts was relaxes P2 : to transfer the force by tendon / R tissue to the bone P3: (Tendon is inelastic and tough) pulled the ulna bone downward (and caused the forearm is straighten)
(c)	F: The muscle can only contract / pull out P: It has to be extended back to it original lenght (to contract again) by the contraction of another muscle
(d)	P1: provides surface area for muscle attachment P2: form the joints that enable the bone to move and allowing movement P3: support the body / forearm weight
(e)	F: the forearm cannot bend / straightens P1: when the muscle X or Y contract P2: the pulling force (produced by contraction of muscle) is not transmit to the radius / ulna

QUESTION 5 - 2014 KEDAH MODUL 2

. Diagram 4.1 and 4.2 show two types of vertebrae in human body.

Rajah 4.1 dan 4.2 menunjukkan dua jenis vertebra dalam badan manusia.

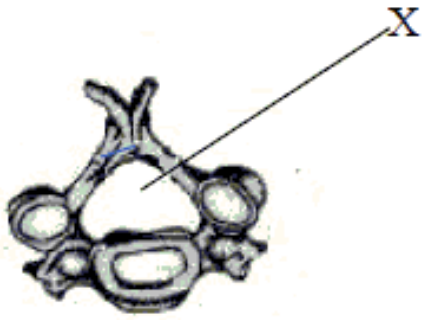


Diagram 4.1
Rajah 4.1

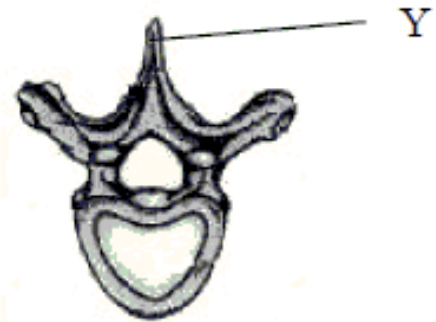


Diagram 4.2
Rajah 4.2

(a) (i) Name the part labelled X and Y
Namakan bahagiari berlabel X dan Y

X: _____
Y: _____
[2marks]

(ii) State the function of structure X and Y
Nyatakan fungsi X dan Y

X: _____
Y: _____
[2marks]

(b) Vertebrae in diagram 4.1 have a specific structures which can be used to differentiate it from others vertebrae.State the structure and their function.
Vertebra P mempunyai satu struktur spesifik yang boleh digunakan untuk membezakannya daripada vertebrata lain. Nyatakan struktur itu dan fungsinya

Structure	/
<i>struktur</i> :.....	
Function	/
<i>Fungsi</i> :.....	
	[2marks]

(c) Explain one feature of the vertebrae in Diagram 4.2 which is related to the mechanism of respiration

Terangkan satu ciri vertebra P yang berkaitan dengan mekanisme respirasi.

[3 marks]

(d) Diagram 4.3 show a knee joint. At the joint the bones are held together by the ligament and each bone is covered by tissue Z.

Rajah 4.3 menunjukkan sendi lutut. Pada sendi ini, tulang-tulang diikatkan bersama oleh ligamen dan setiap tulang dilitupi oleh tisu Z.

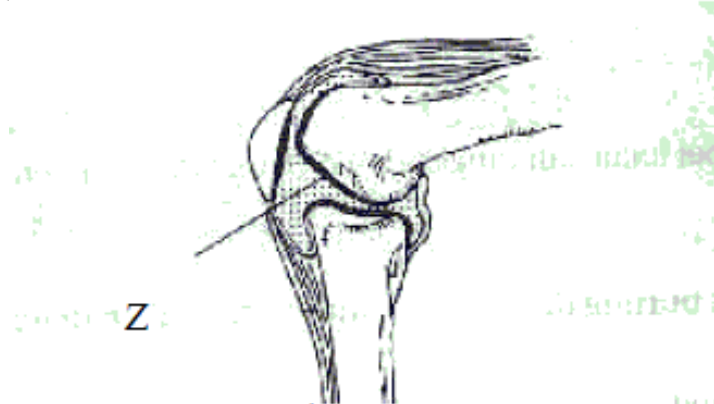


Diagram 4.3

Rajah 4.3

Explain the health problem may experienced by a person when tissue Z is worn out.

Terangkan masalah kesihatan yang dialami oleh seseorang apabila tisu Z telah haus.

[3 marks]

Suggested Answer

(a) (i)	X : Neural canal Y: Spinous process
(ii)	X : Provide the passage of spinal cord Y : Provides surface for the attachment of muscles
(b)	A pair of vertebral foramina To allow the vertebrae to pass through to the brain
(c)	P1 Have two facet/articulating surfaces on the transverse process and the centrum P2 Forming point of the articulation for the rib // Attachment of rib to the transverse process/ thoracic vertebrae P3 Allow the rib to move upwards and downwards P4 Has long spinous process / neural spine for muscles attachment to the rib cage
(d)	P1: Suffers from osteoarthritis P2: Z is a layer of cartilage P3: Cartilages degenerates / worn out and cause friction between the bone during movement P4 : Joint is painful and the patient having difficulties in movement