23. Which of the following structures are the components of a joint?

(1) bone
(2) tendon
(3) ligament

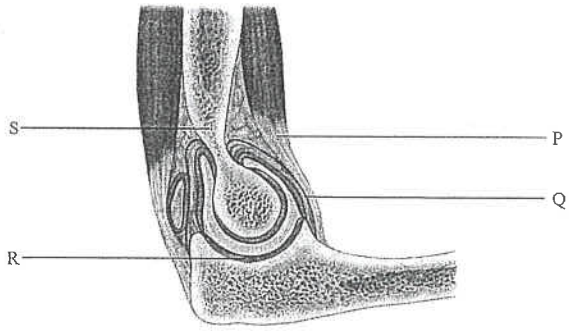
A. (1) and (2) only
B. (1) and (3) only
C. (2) and (3) only
D. (1), (2) and (3)

DSE M.C. Questions - Movement in humans
(sort by difficulty)

Challenging

2015 Q.21 (39%)

Directions: Questions 20 and 21 refer to the diagram below, which shows an elbow joint and its associated structures:



Structure S is able to

(1) carry out respiration.
(2) store minerals.
(3) produce blood cells.

A. (1) and (2) only
B. (1) and (3) only
C. (2) and (3) only
D. (1), (2) and (3)

Average

Directions: Questions 34 and 35 refer to the Diagram I and Diagram II below. Diagram I shows a yoga instructor in a yoga posture. Diagram II shows some of the muscles associated with her left leg.

Diagram I

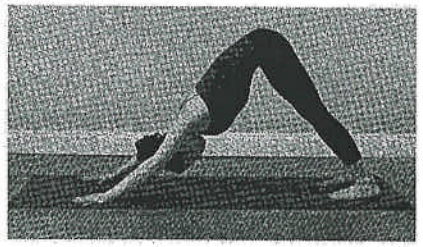
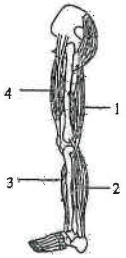


Diagram II



2014 Q.34 (54%)

Which muscles of the left leg of the yoga instructor are contracting when she maintains the posture shown in diagram I?

A. 1 and 2 B. 1 and 3 C. 2 and 4 D. 3 and 4

2014 Q.35 (58%)

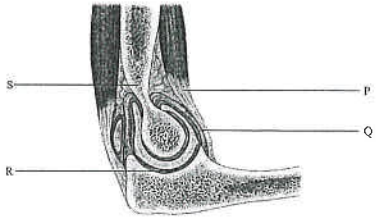
Which muscles of the left leg are flexors?

A. 1 and 2 B. 1 and 3 C. 2 and 4 D. 3 and 4

2015 Q.20 (67%)

Directions:

Questions 20 and 21 refer to the diagram below, which shows an elbow joint and its associated structures:



Which of the above structures are elastic?

A. P and R only B. P and S only C. Q and R only D. Q and S only

Average

Directions: Question 19 to 21 refer to the diagrams below. Diagram I shows the reflex arc of the knee jerk reflex while diagram II shows three types of neurons:

Diagram I

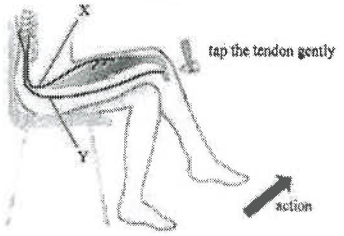
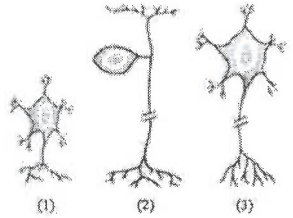


Diagram II



2018 Q.19 (73%)

The effector in the reflex are in Diagram I is

A. a flexor because its response bends the limb
B. an extensor because its response straightens the limb
C. a flexor because it shortens to bring about the movement
D. an extensor because it lengthens to bring about the movement

2018 Q.20 (50%)

Which of the following combinations correctly identifies the types of neurons to which X and Y belong?

	X	Y
A.	(1)	(3)
B.	(2)	(1)
C.	(2)	(3)
D.	(3)	(2)

2018 Q.21 (58%)

Another neural pathway allows the man to feel the tapping action. Which of the following parts should this pathway connect to?

A. Cerebellum
B. Spina cord
C. Cerebral cortex
D. Medulla oblongata

Average

2019 Q.20 (65%)

Directions: Question 19 to 20 refer to Diagram I and Diagram II below. Diagram I shows a leg and its associated muscles while Diagram II shows a woman practicing yoga.

Diagram I

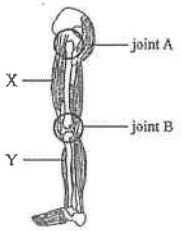


Diagram II

Which of the following combinations correctly indicates the state of muscles X and Y when the woman is maintaining the yoga posture shown in Diagram II?

	X	*Y*
A.	contracted	contracted
B.	contracted	relaxed
C.	relaxed	contracted
D.	relaxed	relaxed

Easy

2012 Q.7 (76%)

In a movable joint, the tissue holding the bones together is called

A. ligament.
B. cartilage.
C. muscle.
D. tendon.

2019 Q.19 (84%)

Directions: Question 19 to 20 refer to Diagram I and Diagram II below. Diagram I shows a leg and its associated muscles while Diagram II shows a woman practicing yoga.

Diagram I

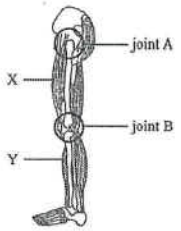


Diagram II

Which of the following combinations correctly identifies joints A and B in Diagram I?

	Joint A	*Joint B*
A.	Hinge joint	Hinge joint
B.	Hinge joint	Ball and socket joint
C.	Ball and socket joint	Ball and socket joint
D.	Ball and socket joint	Hinge joint

2021

23. Which of the following correctly describe the functions of the intervertebral disc?

(1) It prevents the wearing of the vertebrae.
(2) It encloses the spinal cord.
(3) It allows the bending of the vertebral column during movement.

A. (1) and (2) only
B. (1) and (3) only
C. (2) and (3) only
D. (1), (2) and (3)

Answers

Challenging

2015
21 [D]

Average

2014	2015	2018	2019
34 [D]	20 [C]	19 [B]	20 [B]
35 [B]		20 [D]	

Easy

2012	2019
7 [A]	19 [D]

CE - 1997

4. (c) The photographs below show two postures of a woman doing sit-up exercises :

Photograph 1 (Posture 1)

Photograph 2 (Posture 2)

(i) Describe how the movement of the head can be detected by the semi-circular canals of the ear when the woman changes her posture from 1 to 2. (5)

(ii) Referring to photograph 2, which muscles in her arms biceps or triceps, are in a contracted state so that she can touch her knees? (1)

(iii) Give two structural features of the backbone which allow it to bend to a smooth and curved shape as shown in photograph 2. (2)

(iv) Suggest one advantage of doing regular exercise. (1)

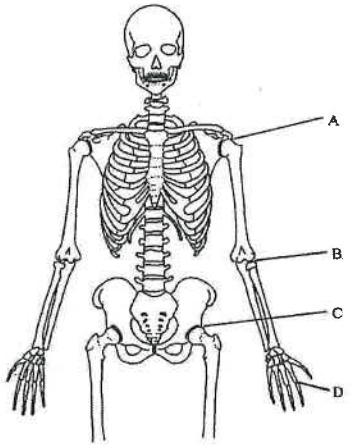
CE - 1998

2. (c) The diagram below shows part of the human skeleton:

(i) Joints A, B, C and D can be classified into two types according to their freedom of movement. Name these two types of joints. Classify A, B, C and D into these two types. (4)

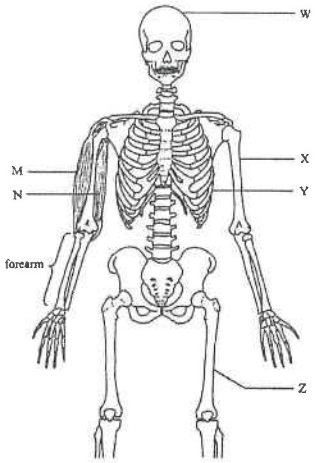
(ii) State how the vertebrae help to maintain the upright posture of a person. (2)

(iii) Osteoporosis is a condition in which the bone material of a person decreases and the bones become more porous and lighter than normal. It is more common in old people. Suggest, with a reason, one way in which people could reduce the chance of getting osteoporosis.(2)



CE - 2002

1. (b) The diagram below shows the human skeleton and two muscles of the right arm, M and N:



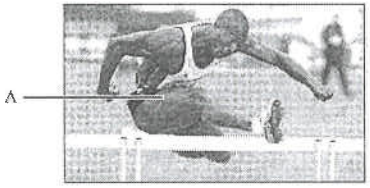
(i) Deficiency of vitamin D in childhood will lead to deformity of bones.
(1) Using the letters in the diagram, indicate which part of the skeleton is most easily deformed. Explain your choice. (3)
(2) Apart from diet, suggest another way by which the body gets vitamin D. (1)

(ii) Why are muscles M and N described as an antagonistic (opposing) pair? (1)

(iii) Draw a diagram to show the lever system involved in lifting the right forearm. Indicate the positions of the load, and the fulcrum in your diagram. In lifting the right forearm, what will form the load, the effort and the fulcrum respectively? (5)

CE - 2009

7. The photograph below shows an athlete leaping a hurdle.



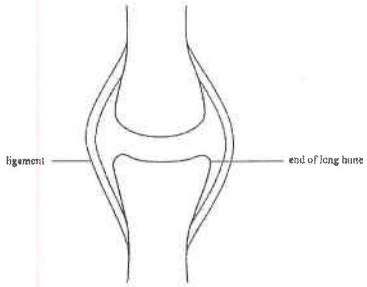
(a) The contraction of muscle A leads to the raising of the lower leg. How do muscle A and other related structures of the leg bring about this action? (3 marks)

AL - 2006 2B

6. (c) Describe how bones and the associated skeletal muscles work together to bring about locomotion. (4)

AL - 2007 1A

5. (a) The diagram below shows some structures of a hinge joint:
On the diagram, draw and label those components that serve to reduce friction at the joint during movement. (4)



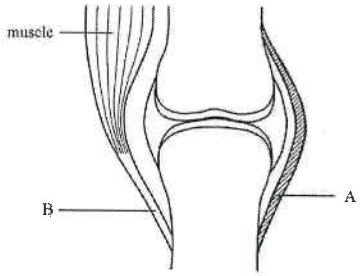
(b) Ligaments are elastic while tendons have very low elasticity. Explain how the elasticity of each structure is important to its function. (2)

AL - 2010 2B

5. (b) In the elderly, knee joints degenerate and the secretion of synovial fluid decrease. This results in knee pain when they walk. Account for the phenomenon in relation to the structure and functioning of the knee joint. (4)

HKDSE - 2013 1B

2. The diagram below shows the structures of a joint.



(a) Name the type of joint shown and suggest an example of such a joint in the body. (2)
Type of joint:
Example in the body:

(b) Briefly describe how A and B work together to bring about movement at the joint shown. (4 marks)

HKDSE - 2017 1B

1. For each of the components of the musculoskeletal system listed in Column I, select from Column II one phrase that correctly describes it. Put the letter in the space provided.(3 marks)

Column I		*Column II*
Ligament	_____	A. Inelastic tissue found at the two ends of a skeletal muscle
Tendon	_____	B. Elastic tissue found at the two ends of a long bone
Cartilage	_____	C. Inelastic tissue that surrounds a joint
		D. Elastic tissue that binds bones together

Past papers Marking Scheme – Movement in humans

CE - 1997 Q. 4 (c)

(i) The movement of the head results in the movement of the endolymph / the gelatinous structure of the semi-circular canal 1
in the direction opposite to the head movement 1
This stimulates the sensory hair cells 1
and nerve impulses are generated and 1
carried to the cerebrum for interpretation 1
Effective communication (c) *1*

(ii) triceps 1

(iii) The backbone is made up of many vertebrae / small bones which are articulated by joints
There are compressible cartilage discs between the vertebrae any two 1,1

(iv) Improve the functioning of the lungs / the heart
Help to reduce body weight
Improve musculature / improve strength of muscles
Improve / maintain the flexibility of joints
Reduce stress / tension any one 1

CE - 1998 Q.2 (c)

(i) *ball and socket joint ; A and C 1+1
*hinge joint ; B and D 1+1

(ii) Vertebrae are linked together by ligaments)
to form a column) any
and they allow the attachment of muscles for maintaining the posture) two 1,1

(iii) Take in more vitamin D [1] to help the absorption of calcium from food [1]

Take in more calcium [1] for bone formation [1] any one set

Do regular weight-bearing exercise [1] to stimulate the increase in bone mass [1]

CE - 2002 Q.1 (b)

(i) (1) Z 1
Deficiency of vitamin D will lead to poor bone growth 1
As Z is not strong enough, the body weight exerting on it will cause it to bend 1
(2) The body produces its own vitamin D under sunlight / UV light 1

(ii) because when producing movements, one muscle contracts, the other relaxes / the contraction of M bends the arm and that of N extends the arm 1

(iii) Title (T) ½
Position of load, effort, fulcrum correct (P) 1 0r 0
Direction of arrows correct (A) ½

The weight of the forearm forms the load 1
The force generated by the contraction of muscle M forms the effort 1
The elbow joint forms the fulcrum 1

CE - 2009 Q.7 (a)

(a) The contraction of muscle A provides a pulling force 1
the force is transmitted o the bone of he lower leg via inelastic tendons 1
This allows movement across the knee joint 1
to raise the lower leg
Effective communication (c) 1

AL – 2006 2B

6. (c) • bones provide a surface for muscular attachment (1) max. 4
• bones and their associated skeletal muscles form a lever system (1) with the joint being the fulcrum (1)
• contraction of skeletal muscles provides the effort (1) / force for pulling onto the bone to bring about movement (1)
• antagonistic pairs of skeletal muscles attached to bones (1) bring about movements in opposite directions (1)

AL - 2007 1A

5 (a) · drawing to show the synovial membrane and articular cartilage (4)
· labels: articular cartilage / cartilage (1)
synovial membrane (1)
synovial fluid (1)

(b) · ligaments have to be elastic so as to allow a certain degree of flexibility in the movement (1) of bones relative to one another at the joint (2)
· tendons have to be of lower elasticity as this will ensure most of the force of muscle contraction is used to pull onto the bones (1) / effective / efficient transfer of force to the bones to bring about movement, instead of stretching the tendons

AL – 2010 2B

5. (b) · when one walks, the knee joint is bent and straightened alternately to bring about movement (1) and bears the weight of the upper body (1) (4)
· as there is less synovial fluid, there is more friction between the articular cartilages (1)
· continuous rubbing leads to wearing of the articular cartilage (1) of the bones at the knee joint
as a result, it would result in pain when they walk

HKDSE - 2013 1B

2. (a) Type of joint: hinge joint * 1
Example in our body: elbow joint / knee joint 1

(b) • A binds bones together (1)
• and prevents dislocation of the bones (1) during movement
• B attaches the muscle to the bone (1) (4)
• and transmits the pulling force (1) produced by muscle contraction

HKDSE – 2017 1B

1. • D (1)
• A (1)
• B (1) (3)

3 marks