SUPPORT AND MOVEMENT IN ANIMALS

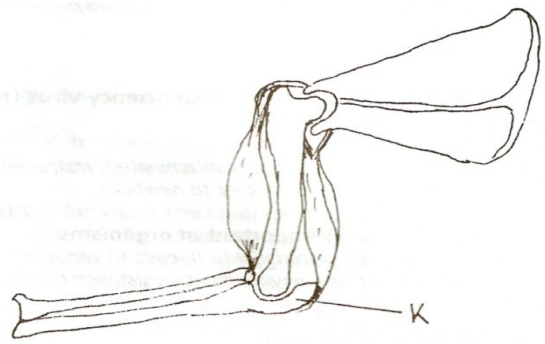
1. 1989 Q6 P1

2. 1991 Q1 P1

State two ways in which skeletal muscle fibers are adapted to their functions

3. 1991 Q5 P1

The diagram below shows the arrangement of bones and muscles in a human arm



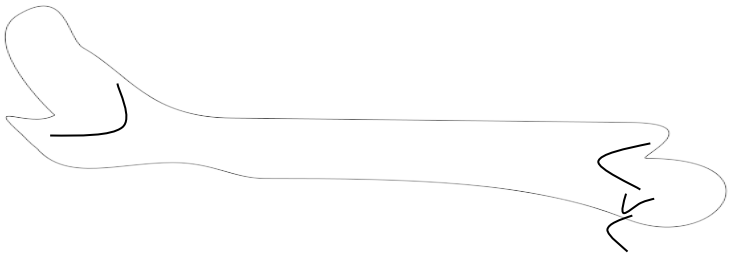
(a) Name the part of the bone labelled K
(b) How do the muscles work to extend the arm?

4. 1997 Q7 P1

State three structural differences between biceps muscles and muscles of the gut (2marks)

5. 1998 Q7 P1

The diagram below represents a mammalian bone



(a) Name the bone (2marks)
(b) Name the type of joint formed by the bone at its anterior end with adjacent bone. (1mark)

6. 2000 Q6 P1

Give a reason why lumbar vertebrae have long and broad transverse process (2marks)

7. 2002 Q8 P1

Which type of joint is found at the articulations of
a) Pelvic girdle and femur
b) Humerus and ulna? (2marks)

8. 2002 Q20 P1

a) Name three types of skeletons found in multicellular animals (3marks)

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b) Describe how the cervical, lumbar and sacral vertebrae are suited to their functions. (17marks)

8. 2003 Q5 P1

10. 2004 Q1 P1

a) Name the cartilage found between the bones of the vertebral column (1 mark)

b) State the function of the cartilage named in (a) above (1 mark)

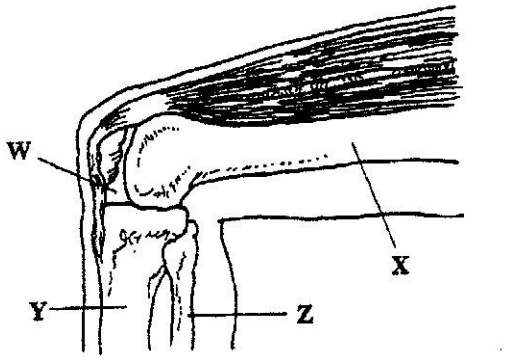
11. 2006 Q20 P1

a) What name is given to response to contact with surface exhibited by tendrils and climbing stems in plants?

b) State three biological importances of tropisms plants.

12. 2006 Q1 P2

The diagram below represents bones at a joint found in the hind limb of a mammal.



a) Name the bones labelled XY and Z (3 marks)

b) i) Name the substance found in the place labelled W. (1 mark)

ii) State the function of the substance named in (b) (i) above. (1 mark)

c) Name the structure that joins the bones together at the joint. (1 mark)

d) State the differences between ball and socket joint and the one illustrated in the diagram above. (1 mark)

e) Name the structure at the elbow that performs the same function as the same function as the patella. (1 mark)

13. 2007 Q24(a) P1

State characteristic that is common to all cervical vertebrae (1 mark)

14. 2007 Q4 P2

(a) Name the three type of muscles found in mammals and give an example of where each of them is found (3 marks)

(b) State the difference between ball and socket and hinge joint (1 mark)

(c) State the functions of synovial fluid (2 marks)

(d) State two advantages of having an exoskeleton (2 marks)

15. 2008 Q19 P1

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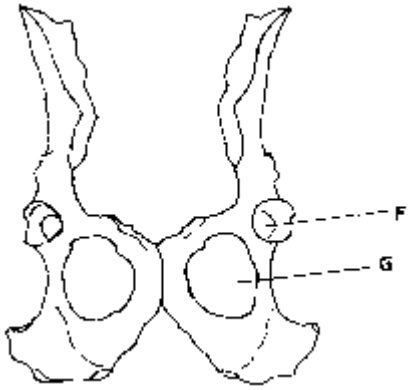
The diagram below represents a tissue obtained from an animal



(a) Identify the tissue (1 mark)
(b) State the functions of the tissue named (a) above (1 mark)

16. 2008 Q30 P1

The diagram below shows two fused bones of a mammal



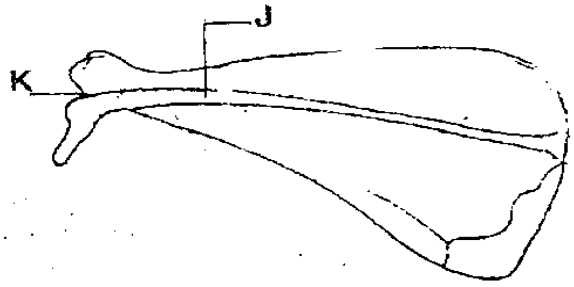
(a) Identify the fused bone (1 mk)
(b) Name the
(i) Bone that articulates at the point labelled F (1 mk)
(ii) The hole labelled G (1 mk)

17. 2008 Q4 P2

(a) Give three reasons in each case why support is necessary in
(i) Plants (3 mks)
(ii) Animals (3 mks)
(b) Why is movement necessary in animals (2 mks)

18. 2009 Q12 P1

12. The diagram below represents a bone obtained from a mammal



(a) Name the bone (1 mk)
(b) Name the:

(i) Bone which articulate with the bone named in (a) above at the cavity labeled

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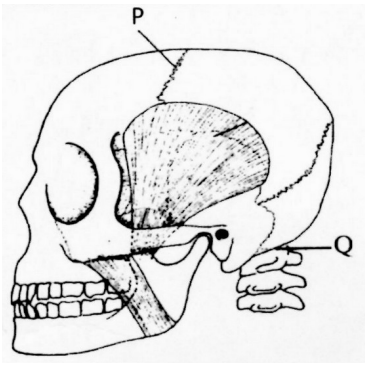
K; (1 mk)
(ii) Joint formed by the two bones (1 mk)
(c) State the function of the part labeled J (1 mk)

19. 2009 Q5(c) P2

5. (a) what happens when a wilting young plants is well watered (3 mks)
(b) Name a support tissue in plants thickened with
(i) Cellulose (1 mk)
(ii) Lignin (1 mk)

20. 2010 Q21 P1

The diagram below represents part of the human skeleton.



a) Name the part labeled **P** (1 mark)
b) i) Name the bone the articulates with the part labeled **Q**. (1 mark)
ii) What type of joint is formed between the part labeled **Q** and the bone named in (b) (i) above? (1mark)

21. 2010 Q8 P2

Describe how a finned fish such as Tilapia moves in water. (20 marks)

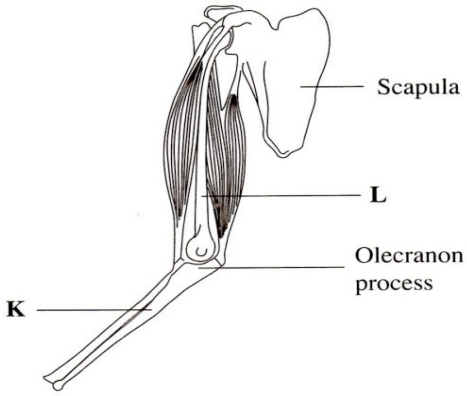
22. 2010 Q8 (a) P2

Describe the exoskeleton and its functions in insects. (13marks)

23. 2012 Q4 P2

(a) The diagram below illustrates the arrangement of bones and muscles in the human arm.

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(i) Name the bones labeled K and L (2 marks)

(ii) Explain how the upward movement of the lower arm is brought about by the bones and muscles shown in the diagram above. (3 marks)

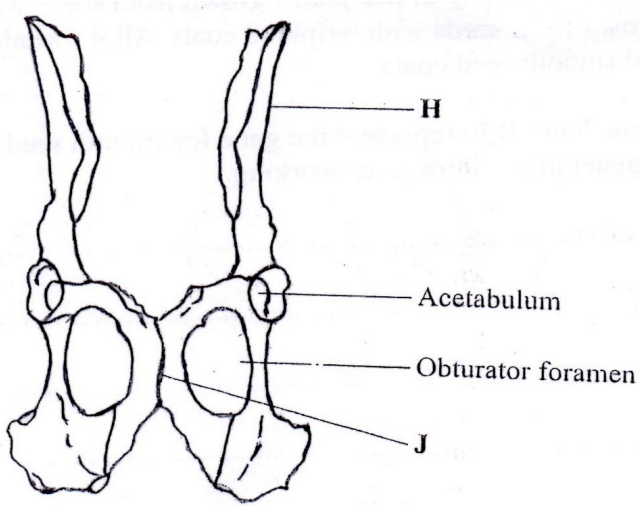
24. 2013 Q28 P1

25. 2013 Q29 P1

State two ways in which osmosis is significant to plants. (2 marks)

26. 2013 Q5 P2

The diagram below represents a mammalian pelvic girdle.



a) How are the structures labelled H and J adapted to their function?

H..... (2 marks)

J..... (2 marks)

b) State the function of obturator foramen. (1 mark)

c) i) Name the bone that articulates with the pelvic girdle at acetabulum (1 mark)

ii) Name the type of joint formed by the acetabulun and the bone named in(c)(i)above. (1 mark)

d) Name the bone formed by the fusion of caudal vertebrae in human beings. (1 mark)

27. 2014 Q9 P1

State **two** functions of intervertebral discs in the mammalian skeleton. (2 marks)

28. 2014 Q15 P1

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(a) Which type of mammalian muscles is voluntary? (1 mark)

(b) Distinguish between a tendon and a ligament. (1 mark)

29. 2014 Q21 P1

Name the type of skeleton that makes up each of the following animals

(a) Locust. (1 mark)

(b)Bird. (1 mark)

SUPPORT AND MOVEMENT IN ANIMALS
MARKING SCHEME

1. 1989 Q6 P1

(a) **K:** Facet for articulation
L: Transverse process- for attachment of muscles.

(b) Cervical or neck region

2 1991 Q1 P1

Skeletal muscles have actin and myosin Sadiomeres/ contractile proteins: which facilitate contraction and relaxation; a high density of mitochondrion provide energy for contraction; elongated fibres to allow change in length.Acc. Atomycin, actin and myosin Re: Haemoglobin because it's found in blood.

3 1991 Q5 P1

(a) Olecranon process
(b) Biceps (flexor muscles) relax triceps (extensor muscles) contract.

4. 1997 Q7 P1

Biceps	Gut Muscles
Striated	Unstriated
Multinucleated	Uninucleated
Long Fibres	Short fibres
Cylindrical	Spindle Shaped

5. 1998 Q7 P1

(a) Femur
Ball and socket

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6. 2000 Q6 P1

Attachments of powerful back muscles that maintain posture flex the vertical column/ support viscera/ abdominal organs

7. 2002 Q8 P1

a) Ball and socket
b) Hinge

8. 2002 Q20 P1

(a) **Hydrostatic**

- Exoskeleton
- Endoskeleton

(b) **Cervical vertabrae**

Vertebraterial canals for passage of (vertebral) artery; atlas has (broad) surfaces for articulation with condylyses of skulls to permit nodding

- Axis has adenoid process/ protein Centrum to permit rotary/ turning act as a pivot for atlas/ skull/ movement of atlas/ Branched / forked/ short/ broad transverse processes, for attachment of (neck) muscles; ace zygopophysis, for articulation between vertebrae (acc. Vertebraterical canals and zygopophogen if shown on a diagram of the vertebrae
- Has a short reduce neural spine, for attachment of (neck) muscles, has wide / larger neural canal; for passage of spinal cord/ alternatively has wide neural for protection of spinal cord.

Lumbar

- Broad/ long/ neural spine for attachment of (powerful back) muscles long/ large/ well development/ transport processes for attachment of muscles
  (that maintain posture and flex the muscles)
- Has metamorphosis and hypothesis for muscle attachment large/ thick centrums for support
- Prezygapophysis/ post/ zygapophysis for articulation between vertebrae (acc. Anapophysis for hypopyses)

Sacral Vertebrae

- Anterior vertebrae has a well developed transverse process, which are fused to the pelvis girdle/ articulate with pelvic girdle
- Vertebrae fused, for strength transmit weight of the stationary animal to the rest of the body.
- Sacrum has a broad base/ short neural spine; for attachment of (back)

9. 2003 Q5 P1

a) Ulna
b) radius;
Humerus;

10. 2004 Q1 P1

a) Intervertebral disc.
b) -Act as a cushion / absorbs shock;

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- Reduce frictions; flexibility of the vertebral column. Rej. prevent avoid.

11. 2006 Q1 P2

(a) X- Femur
Y- Tibia
Z- Fibula

(b) (i) Synovial fluid
(ii) Lubrication of the joint/ shock absorption
Distribution of pressure

(c) Ligament

(a) Ball and socket joint allows movement in all planes while the illustrated allows movement in one plane only. Accept 360^0 for all planes 180^0 for one plane.

(b) Olecranon process.

12. 2007 Q24 (a) P1

Have short neural spines

13. 2007 Q4 P2

Type of muscle	**Where found**
(i) skeletal	Attached bones and skeleton
(ii) Smooth	Walls of tabular structures
(iii) Cardiac	Heart muscles

(b) Ball and socket joint- allow movement in all directions i.e 360^0
Hinge joint – Allow movement only on one plane i.e 180^0

(c) It's a slippery fluid that lubricates the joints reducing friction during movement

(d) Prevents drying out of organism
Controls size of the organism
- Provides protection against microbial infections and mechanical injury

14. 2008 Q19 P1

(a) Cardiac muscle

(b) Contraction of the heart

15. 2008 Q30 P1

(a) Pelvic girdle

(b) (i) Femur
(ii) Obturatar foramen.

16. 2008 Q4 P2

(a) **(i) Plants**
Expose the surface area of leaf to sun light for photosynthesis
Ensure flowers are exposed to pollution
Expose fruits seeds to disperse
To resist breakage (due to their own weight and that of the organism)

(ii) Animals
Attachment of other body organs
To protect delicate organs

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Maintain body shape/ form
Enable movement/ locomotion
Attachment of muscles

(b) Enable animals to search for funds
Enable animals to search for shelter
Enable animals to search for water
Enables animals to search for breeding
Enables animals to escape predator/ harmful conditions

17. 2009 Q12 P1

(a) Scapula; *Acc. Scapul*
(b) (i) Humerus; *Acc: Humerous but Rej: Humourous*
Ref: ball/socket, Rej. Socket and ball joing
(ii) Ball and socket joint;
c) Attachment of muscles

18. 2009 Q5(c) P2

- Steering
- Balancing
- Braking, changing direction
- Prevent fish from pitching / up and down movement

19. 2010 Q20 P1

(a) P – sutures
(b) i) Atlas;
ii) Hinge joint

20. 2010 Q8 P2

Movement of fish in water is by swimming. It involves forward movement and control of the body position in water. Mucus / streamline body shape reduces friction/ resistance (Acc; scale overlapping backwards) to enhance forward movement; forward movement/ propulsion is caused by the tail. The tail is long (almost half the large of the body of the fish) to enable it create enough force(to enable the fish push forward). Propulsion is achieved when the tail pushes sideways against water. Sideways movement is brought about by muscles arranged in segmented blocks/ myotomes on both sides of vertebrate column to swing sideways; when the muscle blocks on the right relax and those on the left contract; the body bends to the left side. When the muscle of the left relax and those on the right contract; the body bends to the right side; the fish uses its fins to control the position of body in water. During forward movement paired fin/ pectoral & pelvic fins). Lie flat on the body surface to reduce friction/ resistance. To change direction the fish uses the paired fins. Paired fins also are used by fish to change its level in water / control pitching. The fish spreads out the pectoral & pelvic fins at 90^0 to the body; to enable it brake. Fish can also use the swim bladder to change its level in water. When the bladder fills up with air the fish become less dense / lighter making it to rise in water; when the air leaves the bladder the fish becomes more dense/ heavier; making it to sink deeper in the water. Water currents may cause sideways swaying of the body of the fish/ yawing. The dorsal and ventral fins (also) prevent rolling / yawing; Acc anal fin for ventral fin.

21. 2011 Q27 P1

(a) Ligament ;
(b) Secretes synovial fluid; contains /holds the synovial fluid in place;

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22. 2010 Q8 (a) P2

- The exoskeleton is made of chitin; chitin is not evenly distributed / is thin and (flexible) at joint; for movement; exoskeleton is secreted by the epidermal cells; when still soft it allows for growth of the insect; when in contact with air it hardens/ limiting growth; it is shed regularly; thus regulating the growth of insect; it also supports the internal structures; because it is hard; it protects internal organs from mechanical damage; it is water proof; preventing / reducing water loss / desiccation; of the insect.
- It also provides a surface for attachment of muscles; it is light / low density ; for flight; can be modified to form hard parts / jaws; for biting / piercing/ sucking/ grinding; it is pigmental; for camouflage; can be transparent at some places for allowing entry of light into the eye; for camouflage in water.

23. 2012 Q4 P2

(a) (i) **K**- Ulna

L- Humerus

(ii) Movement of lower arm upwards takes place at the elbow,olecranon process which is between the ulna and the humerus;biceps/flexor muscles contract;while the triceps/extensor muscles relax; bringing about the movement of lower arm upwards.

24. 2013 Q28 P1

(a) • has two bones, one with round head and the other with a cavity where head fits
• allows movement in all directions i.e. rotates through 360°

(b) (i) atlas (ii) axis

25. 2013 Q29 P1

- made of fused bones to form a rigid/strong structure to bear the body weight
- forms joints with bones of the hind limbs to make walking/movement possible
- provide large surface area to which powerful muscles of the leg are attached
- the two hales are joined together by flexible cartilage (pubic symphysis) which permits widening of the female girdle when giving birth.

26. 2013 Q5 P2

(a) (i) H:

- ilium provide a large surface area for attachment of thigh muscles
- has sacral facet for articulation with wing like transverse process of the first sacral vertebra

(ii) J: pubic symphysis - it's made of flexible cartilage that permits widening of the female girdles during parturition.

(b) It is an aperture that allows passage of blood vessels, nerves and muscles.

(c) (i) Femur (ii) Ball and socket joint

(d) Coccyx

27. 2014 Q9 P1

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- Act as shock absorbers
- Allow smooth movement between vertebrae / reduce friction between vertebrae

28. 2014 Q15 P1

- Skeletal muscle /striated /stripped

29. 2014 Q21 P1

(a) Exoskeleton

(b) Endoskeleton

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