YAKEEN NEET 2.0

2026

4 June 2025

STRUCTURAL ORGANISATION IN ANIMALS

ZOOLOGY | Lecture – 07

By- SAMAPTI MAM

Topics to be covered

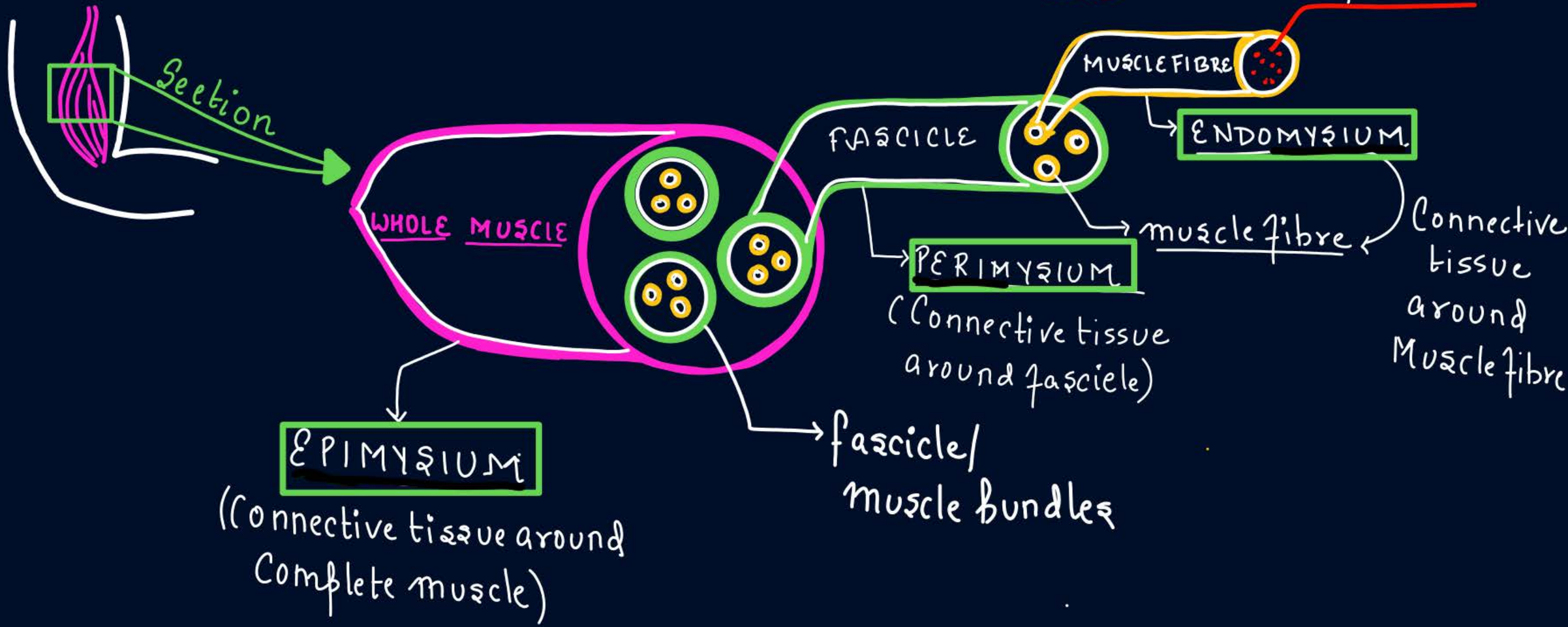
1. MUSCULAR TISSUE
2.
3.
4.

MY TELEGRAM

#Samaptiexpress

MUSCULAR TISSUE:

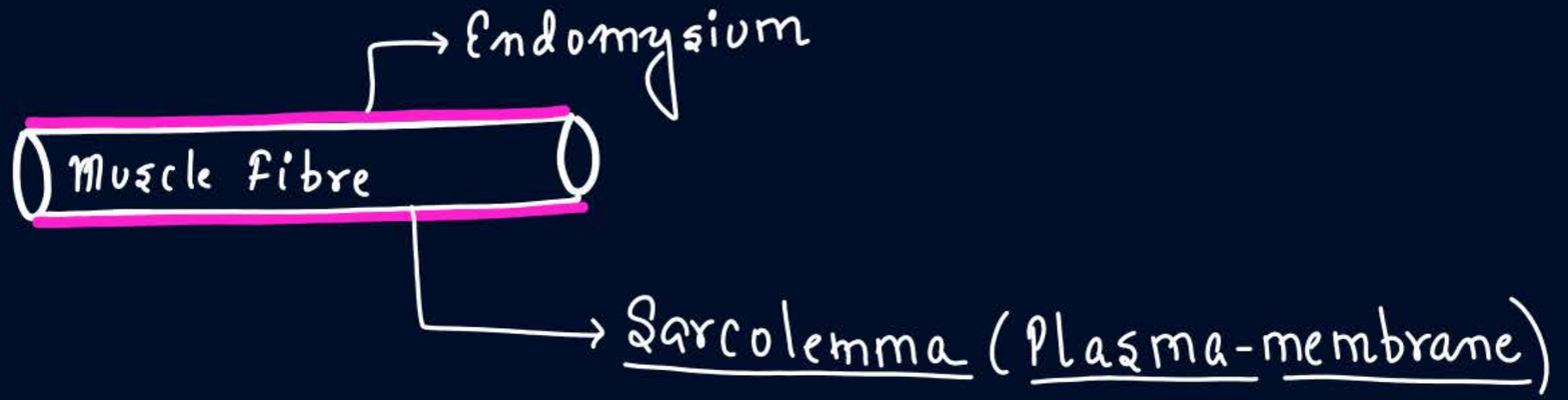
Muscle fibre: Muscle cell



H.W

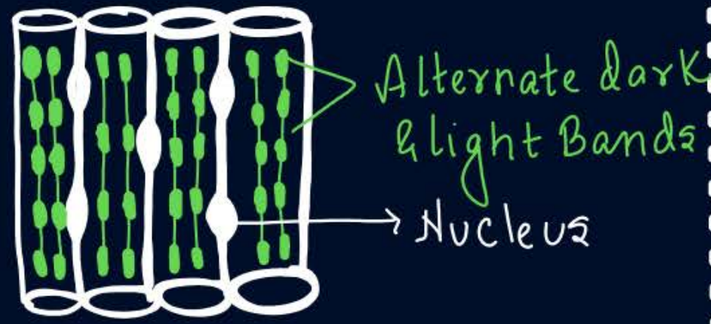
1. Whole muscle :
2. Fascicle :
3. Musclefibre :

Note



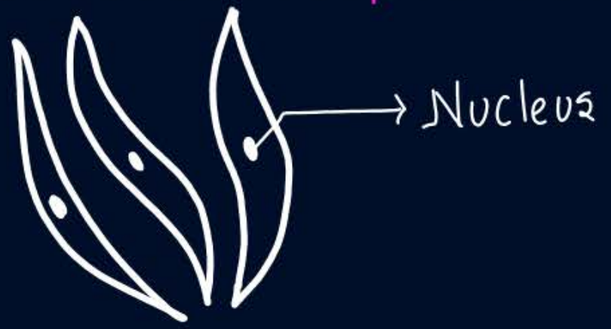
TYPES OF MUSCLE FIBRE:

Skeletal muscle fibre



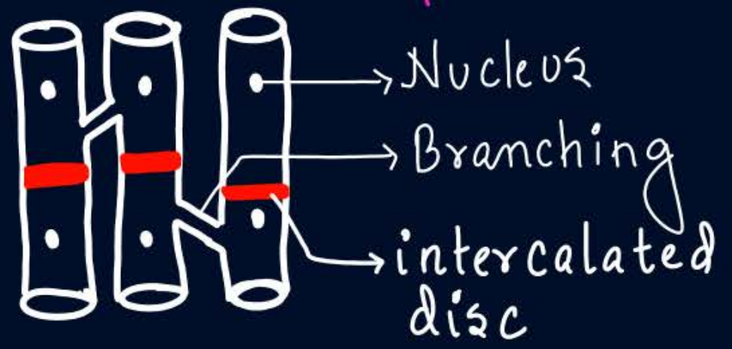
1) Cylindrical muscle fibre
2) Unbranched "
3) Multinucleated, nuckus in Periphery
4) Alternate Dark & light Bands c/a STRIATIONS are prominantly seen hence c/a STRIATED (Striped) muscle

Smooth muscle fibre



1) SPINDLE / FUSIFORM
2) Unbranched
3) Uninucleated, centre
4) No Striations

Cardiac muscle fibre



1) CYLINDRICAL
2) Branched
3) Uninucleated, centre
4) Faint Striations present but also k/a Striated muscles.

Skeletal muscle fibre

5. Voluntary control of N.S
6. Fast contraction
7. Rich Blood supply
8. Easily fatigue
9. Intercalated disc ✗

eg: Biceps, triceps, facial muscle

Note

Skeletal muscle in close association with Bone bring movement

Smooth muscle fibre

5. Involuntary control of N.S
6. Slow contraction
7. Low Blood supply
8. Slowly fatigue
9. Intercalated disc ✗

(Gap junctions & adhering junction (which holds them together) present

eg: Blood vessels, iris, Ciliary muscle, intestine, stomach etc.

Cardiac muscle fibre

5) Involuntary
6) Fastest contraction
7) Abundant Blood supply
8) Never fatigue.
9) Intercalated disc ✓

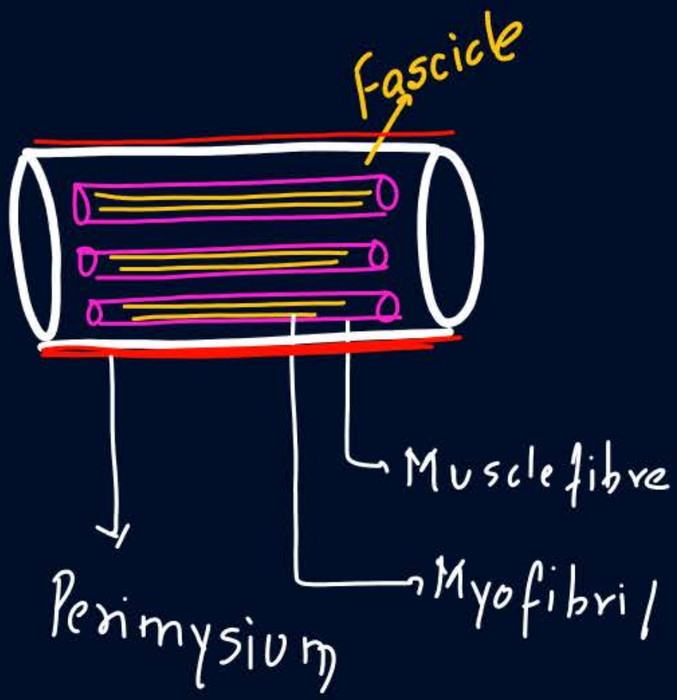
(Gap + Adhering)

eg: Heart

7.1.3 Muscle Tissue

Each muscle is made of many long, cylindrical fibres arranged in parallel arrays. These fibres are composed of numerous fine fibrils, called myofibrils. Muscle fibres contract (shorten) in response to stimulation, then relax (lengthen) and return to their uncontracted state in a coordinated fashion. Their action moves the body to adjust to the changes in the environment and to maintain the positions of the various parts of the body. In general, muscles play an active role in all the movements of the body. Muscles are of three types, skeletal, smooth, and cardiac.

Skeletal muscle tissue is closely attached to skeletal bones. In a typical muscle such as the biceps, striated (striped) skeletal muscle fibres are bundled together in a parallel fashion (Figure 7.7a). A sheath of tough connective tissue encloses several bundles of muscle fibres (You will learn more about this in Chapter 20).



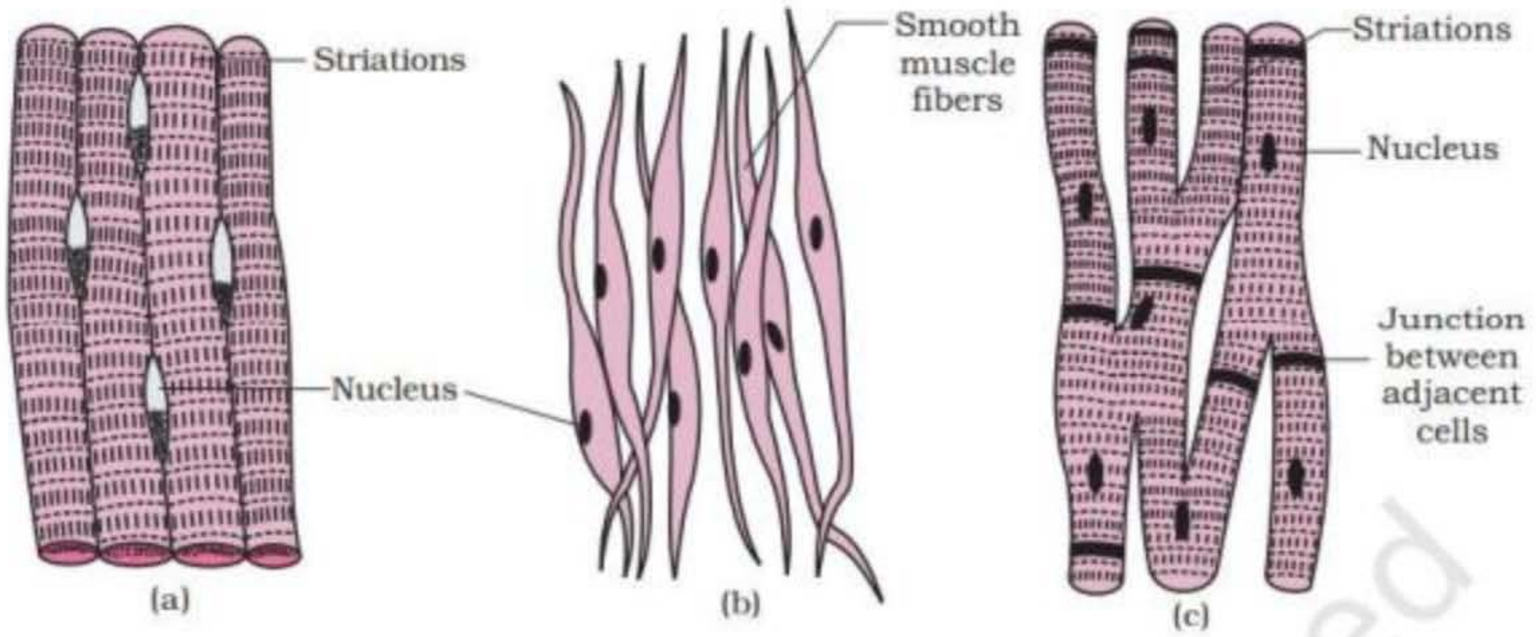


Figure 7.7 Muscle tissue : (a) Skeletal (striated) muscle tissue (b) Smooth muscle tissue (c) Cardiac muscle tissue

The **smooth muscle** fibres taper at both ends (fusiform) and do not show striations (Figure 7.7b). Cell junctions hold them together and they are bundled together in a connective tissue sheath. The wall of internal organs such as the blood vessels, stomach and intestine contains this type of muscle tissue. Smooth muscles are 'involuntary' as their functioning cannot be directly controlled. We usually are not able to make it contract merely by thinking about it as we can do with skeletal muscles.

Cardiac muscle tissue is a contractile tissue present only in the heart. Cell junctions fuse the plasma membranes of cardiac muscle cells and make them stick together (Figure 7.7c). Communication junctions (intercalated discs) at some fusion points allow the cells to contract as a unit, i.e., when one cell receives a signal to contract, its neighbours are also stimulated to contract.

Neural Tissue:

- Ectodermal in origin

Neural Tissue

① NEURON

- Longest cell of the Body
- Structural & functional unit of neural tissue.
- EXCITABLE CELLS.
- CONDUCTIBILITY (flow of ions / current)

② NEUROGLIAL CELLS

- Make up more than 50% volume of the entire Neural tissue
- NON-EXCITABLE
- No Conduction
- These help in SUPPORT & PACKAGING of Neuron (secretion of Myelin sheath)
  eg: Schwann cells,
  Oligodendrocytes.

Ncert Catalyst

PW Discussion

QUESTION

Given below are two statements.

Statement I: Bones have a hard and non-pliable ground substance rich in calcium salts and elastic fibres.

Statement II: cartilage is the main tissue that provides structural frame to the body.

In the light of the above statements, choose the most appropriate answer from the options given below.

1. Statement I is correct but Statement II is incorrect.
2. Statement I is incorrect but Statement II is correct.
3. Both Statement I and Statement II are correct.
4. Both Statement I and Statement II are incorrect.

The only connective tissue without fibres is

(a) areolar connective tissue
(b) bone
(c) cartilage
(d) blood

Q-2
4

Assertion (A): Bone is stronger than cartilage.

Reason(R): Bone matrix is hardened by calcium salts.

A. Both A and R are true and R is the correct explanation of A

B. Both A and R are true but R is not the correct explanation

C. A is true but R is false

D. A is false but R is true

STATEMENT 1- Matrix is present in the form of rings in bones called lacunae

STATEMENT 2- Osteocytes can be multiple in one lacunae

1. Statement I is correct but Statement II is incorrect.

2. Statement I is incorrect but Statement II is correct.

3. Both Statement I and Statement II are correct.

4. Both Statement I and Statement II are incorrect.

Assertion (A): Cartilage provides flexibility to body structures.
Reason (R): Cartilage has a SOFT and pliable matrix

A. Both A and R are true and R is the correct explanation of A
B. Both A and R are true but R is not the correct explanation
C. A is true but R is false
D. A is false but R is true

STATEMENT 1- Bone cells are embedded in a hard matrix of calcium and phosphorus.
STATEMENT 2- These minerals provide flexibility to the bone.

Osteocytes → Fluid fluid → lacunae.

Q-6

1. Statement I is correct but Statement II is incorrect.

2. Statement I is incorrect but Statement II is correct.

3. Both Statement I and Statement II are correct.

4. Both Statement I and Statement II are incorrect.

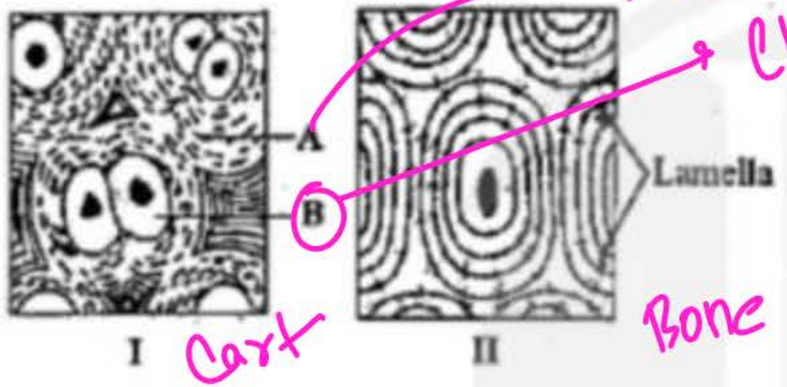
1.Which of the following statements is/are not correct regarding connective tissues.

(i) They are most abundant and widely distributed in the body of complex animals.
(ii) They connect and support other tissues.
(iii) They include diverse tissues such as bones, cartilage, tendons, adipose and other loose connective tissues.
(iv) They form the internal and external lining of many organs.
(v) In all connective tissues except blood, the cells secrete fibres of structural proteins like collagen and elastin.

Which of the above statements are incorrect?

(A) (iv) only
(B) (v) only
(C) i and ii only
(D) iii and v only

Refer to the diagram given below:



Which of the following is the correct identification of **A**, **B**, **I** and **II**.

(A) I-Cartilage, II-Bone, A-Collagen fibres, B-Chondrocyte

(B) I-Cartilage, II-Bone, A-Collagen fibres, B-Chondroblast

(C) I-Bone, II-Cartilage, A-Microtubules, B-Osteoblast

(D) I-Bone, II-Cartilage, A-Collagen fibres, B-Osteoblast

Collagen
Chondrocyte
Cart
Bone
Q8
A

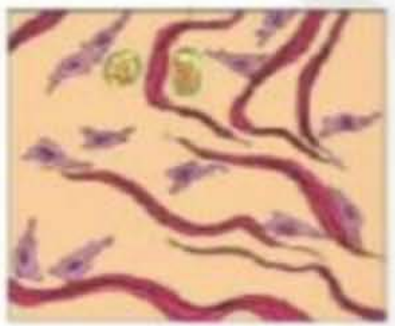
Read the following statements

(a) Ground substance is hard and non-pliable

(b) Rich in collagen fibres and calcium salts

(c) Main tissue that provides a structural frame to the body

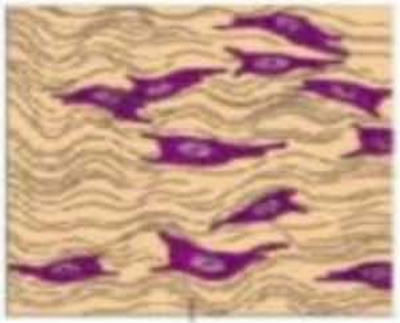
Identify the tissue on the basis of given characteristics and choose the correct option from the given diagrams



(A)

(B)

(C)



(D)

Q-9

B

Read the following statements and answer thequestion.

(i) They have a hard and non-pliable ground substance rich in calcium salts and collagen fibres.

(ii) They provide support and protection for softer tissues and organs.

(iii) Osteocytes are present in the spaces called lacunae.

(iv) They also interact with skeletal muscles attached to them to bring about movements.

Which of the following type of tissue is being described by above statements?

(A) Cartilage

(B) Bone

(C) Blood

(D) Neurons

Q-10 B

Choose correct option which have all right statement for bones.

(A) Bones have a hard and non-pliable ground substance.

(B) Matrix of bone is rich in calcium salt and free from collagen fibres.

(C) Bone marrow in some bones is the site of production of blood cells.

(D) Bone is a type of specialised connective tissue.

(A) A, B and C

(B) A, C and D

(C) A and D only

(D) All of these

Q-11

B

QUESTION

Given below are two statements.

Statement I: Cartilage is a specialised connective tissue.

Statement II: The intercellular material of cartilage is solid and pliable and resists compression.

In the light of the above statements, choose the most appropriate answer from the options given below.

1. Statement I is correct but Statement II is incorrect.
2. Statement I is incorrect but Statement II is correct.
3. Both Statement I and Statement II are correct.
4. Both Statement I and Statement II are incorrect.

Homework

- REVISE CLAASNOTES / ZOOLOGY MED EASY

MODULE HW
PARIKSHIT EX 3- 13-22

Samapti Sinha Mahapatra

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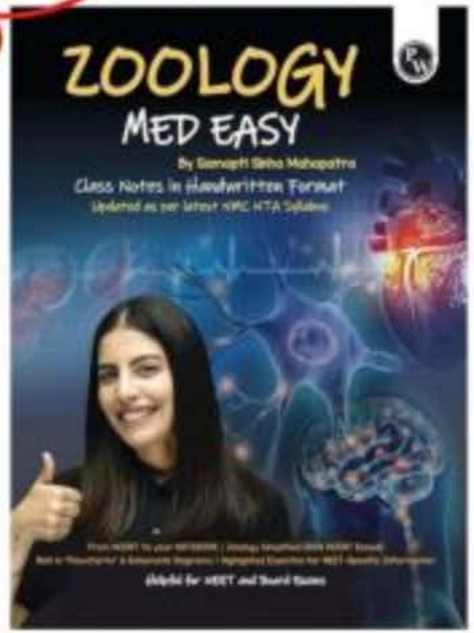

THANK YOU