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YAKEEN NEET 2.0

2026

STRUCTURAL ORGANISATION IN ANIMALS

ZOOLOGY

Lecture – 05

By- SAMAPTI MAM





Topics to be covered

1

CONNECTIVE TISSUE

2

3

4



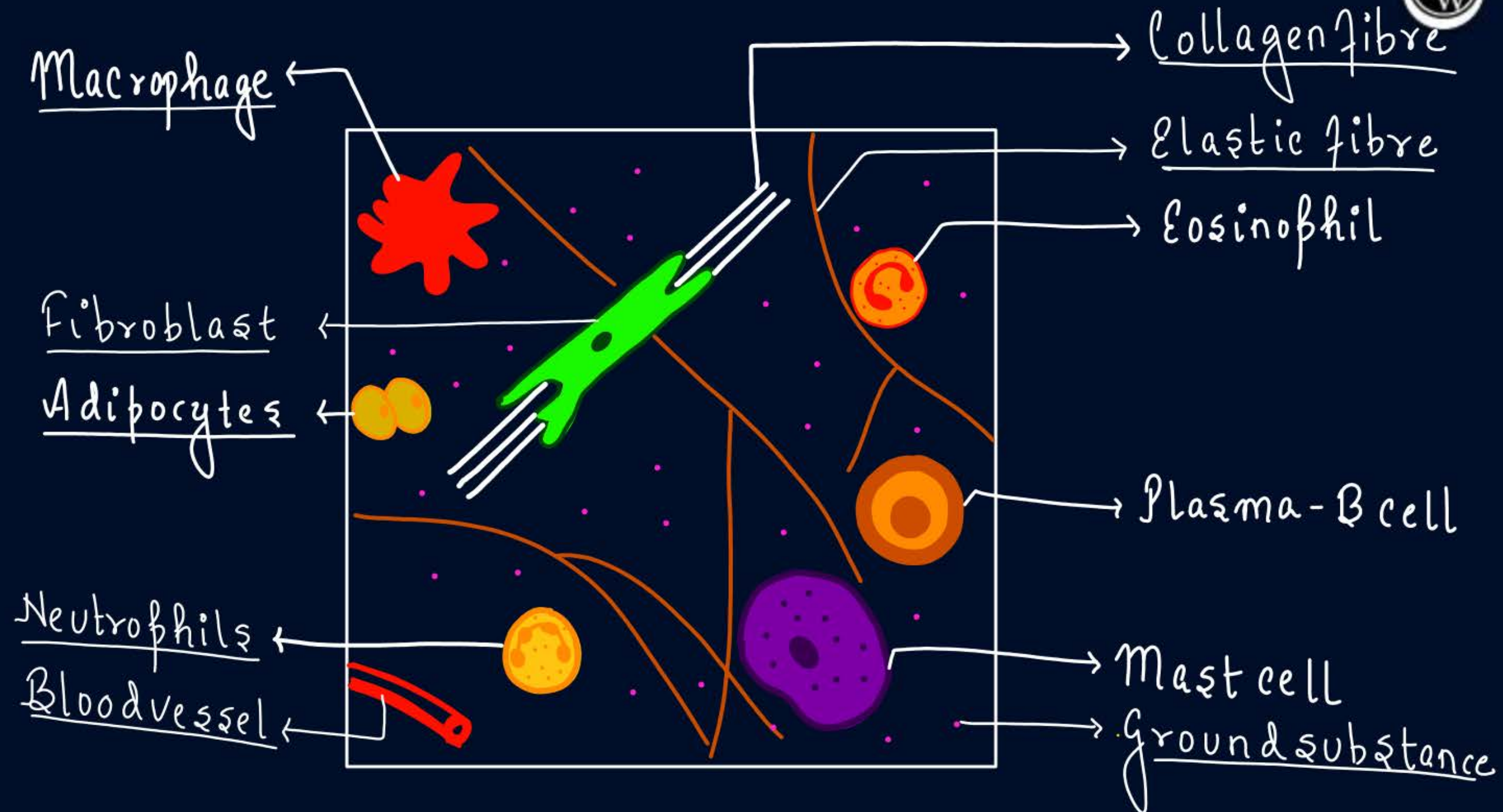
Lamphierers

Axolar C.T

Cells:

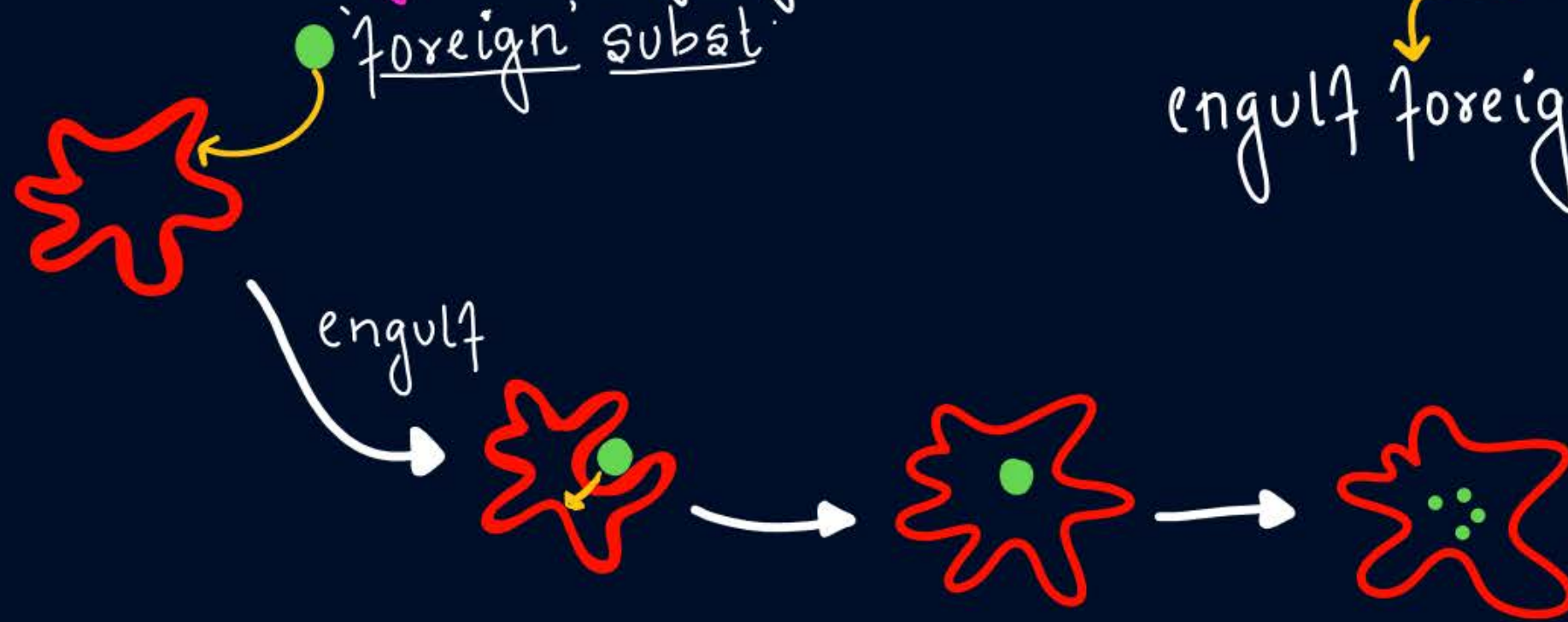
1) Fibroblast:

- Most abundant
- Secretes the ground substance & fibres



② Macrophage: Phagocytic cell: performs 'phagocytosis'

engulf foreign particle & destroys



'lytic' (Breaking) enzymes act on the foreign subst. & Break it.

③ Eosinophil

④ Neutrophil

⑤ Plasma-B-cell

Type of W.B.C

→ Secrete Antibodies

⑥ Mast cells: Are involved in Inflammatory rxn

Inflammation means

→ Redness
→ Warmth
→ Swelled

responsible for

* Mast cell secretes

→ Histamine: Vasodilator
Blood vessel



→ Serotonin: Vasoconstrictor
Blood vessel



→ Heparin: Anticoagulant : Prevent Blood Clotting
opposite clot

Type of fibres



COLLAGEN

- White in color: hence called 'WHITE FIBRES': 'Collagen' ^{protein}
- Present in BUNDLES
- Responsible for Strength
- Unbranched



ELASTIC

- Yellow in color hence called 'YELLOW FIBRES': 'ELASTIN' proteins
- Present individually
- Responsible for elasticity
- Branched



Note Reticular fibre (a type of Collagen fibres) are also present responsible for FLEXIBILITY.

Location & Function of AREOLAR:



- Present Beneath/Below SKIN : Means it connects the SKIN with the underlying muscles
- It acts as a support framework for Epithelium.
- Around Blood vessel, Nerves.

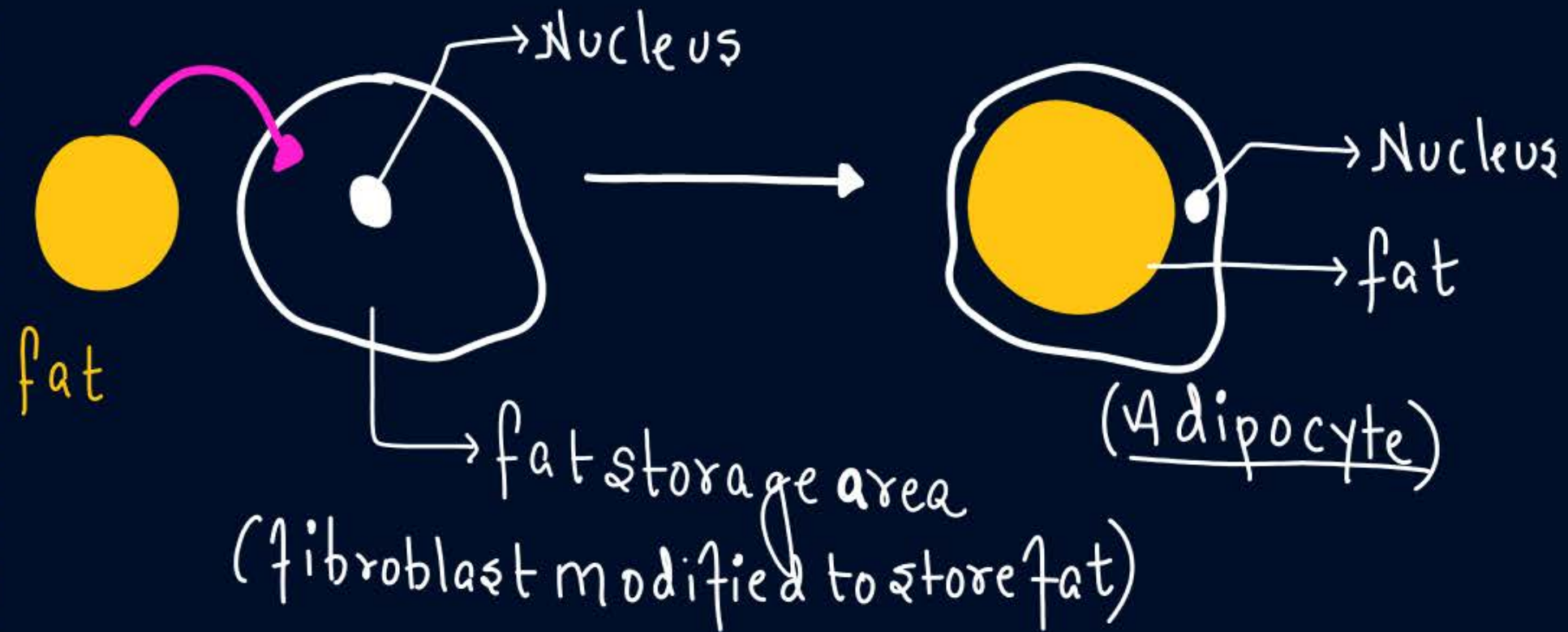


② Adipose C.T: It is a SPECIALISED loose C.T (as per NCERT, summary, its a SPECIALISED C.T)

↓
Specialised to store fats

- All cells similar to Areolar but has 'Abundant ADIPOCYTES' that are the 'FAT-FILLED CELLS'.

- Excess of nutrients that are not used immediately are converted into FAT & stored in the cells c/a 'ADIPOCYTES'.



Location & Function:

- Beneath SKIN
- Around visceral organs like kidney: Act as 'CUSHION' & 'SHOCK ABSORBER'
- In some aquatic animals like: WHALE' thick layer of fat c/a BLUBBER present below SKIN: Act as insulator.

7.1.2 Connective Tissue

Connective tissues are most abundant and widely distributed in the body of complex animals. They are named connective tissues because of their special function of linking and supporting other tissues/organs of the body. They range from soft connective tissues to specialised types, which

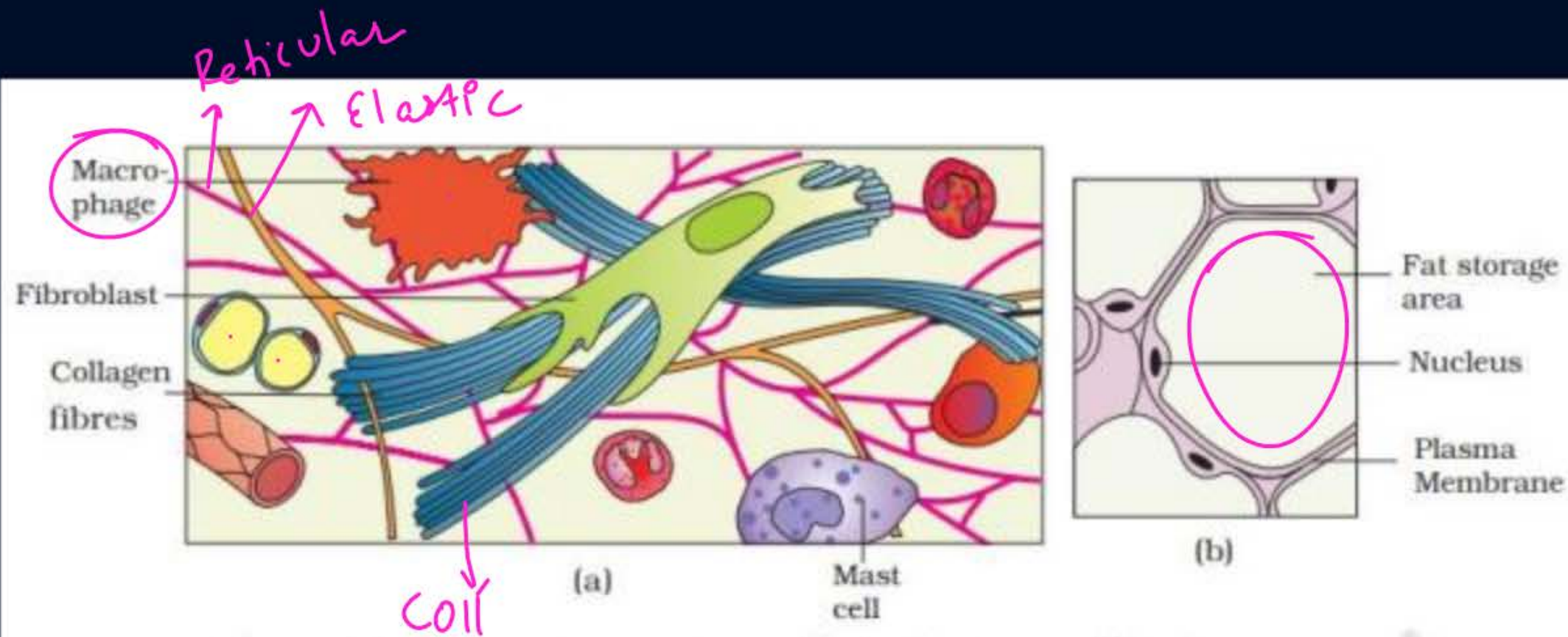
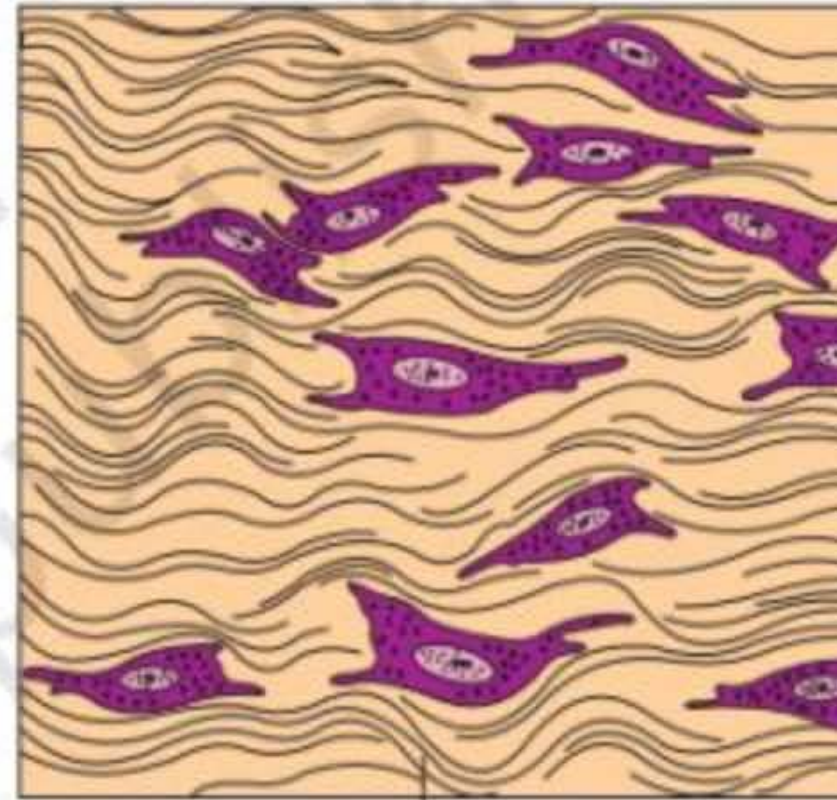


Figure 7.4 Loose connective tissue : (a) Areolar tissue (b) Adipose tissue

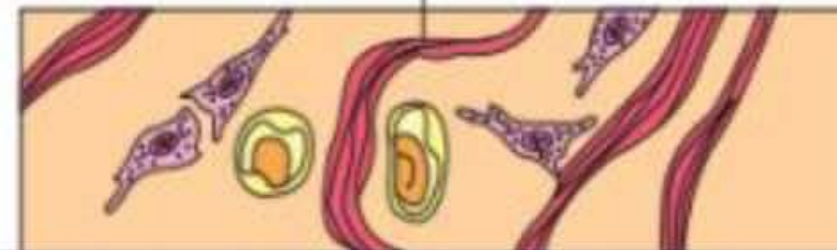
include cartilage, bone, **adipose** and blood. In all connective tissues except blood, the cells secrete fibres of structural proteins called collagen or elastin. The fibres provide strength, elasticity and flexibility to the tissue. These cells also secrete modified polysaccharides, which accumulate between cells and fibres and act as matrix (ground substance). Connective tissues are classified into three types: (i) Loose connective tissue, (ii) Dense connective tissue and (iii) Specialised connective tissue.

Loose connective tissue has cells and fibres loosely arranged in a semi-fluid ground substance, for example, **areolar tissue** present beneath the skin (Figure 7.4). Often it serves as a support framework for epithelium. It contains fibroblasts (cells that produce and secrete fibres), macrophages and mast cells. **Adipose tissue** is another type of loose connective tissue located mainly beneath the skin. The cells of this tissue are specialised to store fats. The excess of nutrients which are not used immediately are converted into fats and are stored in this tissue.



(a)

Collagen fibre



DENSE CONNECTIVE TISSUE:

- Matrix ↓, Cells & fibres compactly packed in ground substance.

Dense C.T

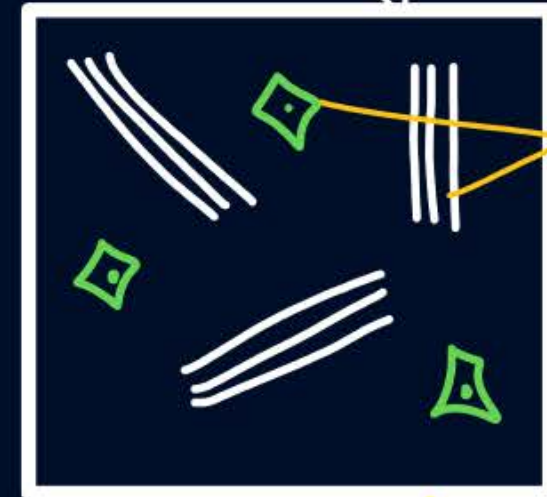
Dense Regular C.T



Cells & fibres are
Parallelly arrangement
(Uniform)

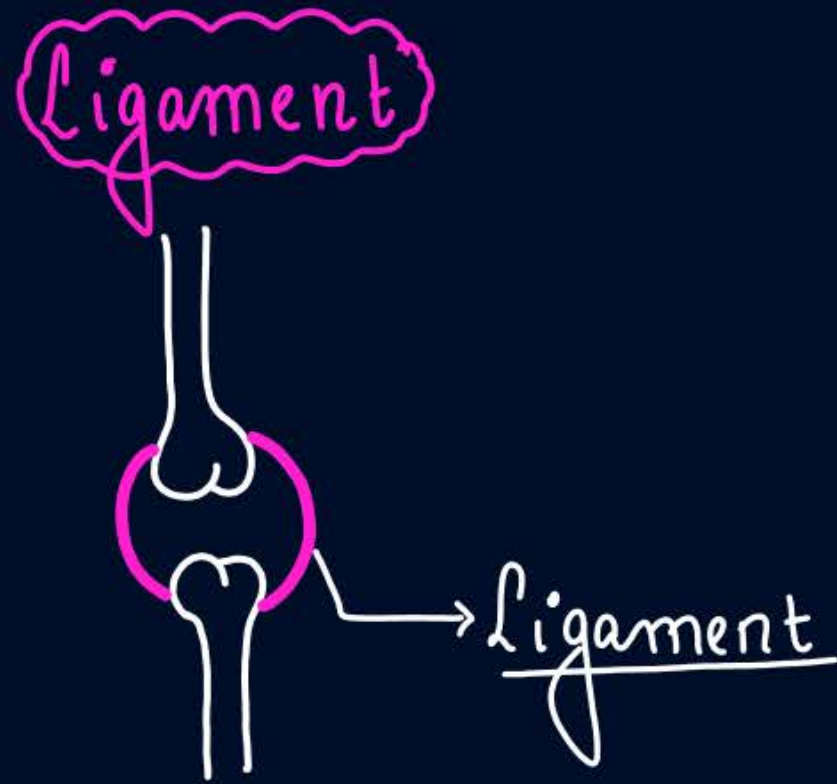
eg: Ligament & Tendon

Dense irregular C.T

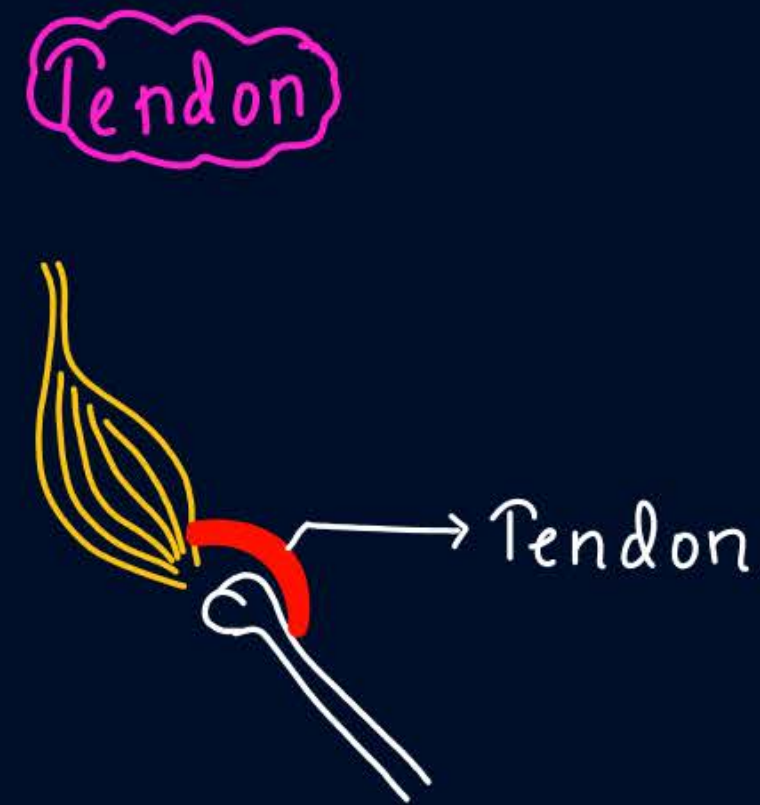


Cells & fibres
(mostly collagen)
are randomly
present /
arranged

eg: SKIN (Dermis)

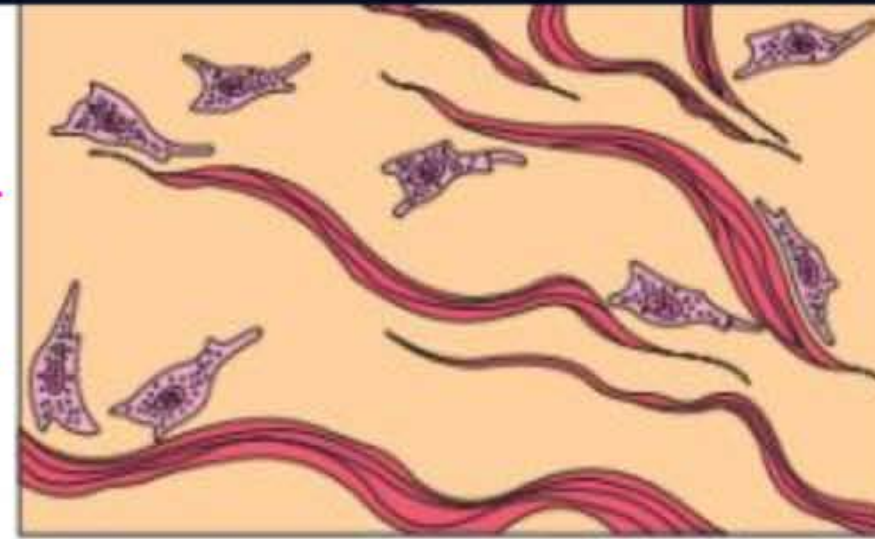


Connects Bone to Bone



Connects Muscles to Bone
 ↓
 (Skeletal)

Fibres and fibroblasts are compactly packed in the **dense connective tissues**. Orientation of fibres show a regular or irregular pattern and are called **dense regular** and **dense irregular tissues**. In the dense regular connective tissues, the collagen fibres are present in rows between many parallel bundles of fibres. Tendons which attach skeletal muscles to bones and ligaments which attach one bone to another are examples of this tissue. Dense irregular connective tissue has fibroblasts and many fibres (mostly collagen) that are oriented differently (Figure 7.5). This tissue is present in the skin. Cartilage,



(b)

H.W Question discussion

Match the **Column-I** with **Column-II**.

	Column-I		Column-II
(a)	Tight junctions	(i)	Cement neighbouring cells together to form sheet
(b)	Adhering	(ii)	Transmit information through chemical to another cells
(c)	Gap junctions	(iii)	Establish a barrier to prevent leakage of fluid across epithelial cells
(d)	Synaptic junctions	(iv)	Cytoplasmic channels to facilitate communication between adjacent cells

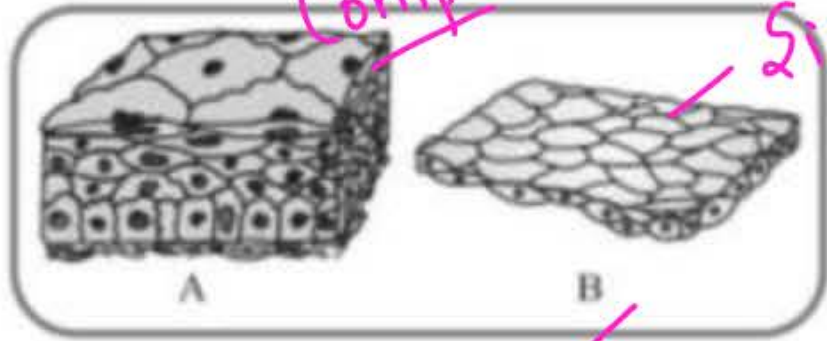
Choose the **correct** answer from the following options:

- (A) (a)-(iv) (b)-(iii) (c)-(i) (d)-(ii)
 (B) (a)-(ii) (b)-(iv) (c)-(i) (d)-(iii)
 (C) (a)-(iv) (b)-(ii) (c)-(i) (d)-(iii)
 (D) (a)-(iii) (b)-(i) (c)-(iv) (d)-(ii)

0-1

4

Identify the correct option with respect to the figures (A & B) given below.



(A) A: provide protection against chemical and mechanical stresses: Stomach. ☒

(B) A: secrete mucus, saliva, earwax, oil, milk, digestive enzymes: Stomach. ☒

(C) B: found in the walls of blood vessels and air sacs of lungs : diffusion boundary. ☒

(D) B: mainly present in the inner surface of hollow organs: Secretion and absorption. ☒

Q-2

3

Read the following statements and choose the correct option.

- I. Cells of germinal epithelium are cuboidal. (T)
- II. Main function of stratified squamous epithelium is protection. (T)
- III. Ciliated epithelium is found in trachea and fallopian tubes. (T)

Q-3

(D)

(Simple Epithelium)

Pseudostratified ciliated

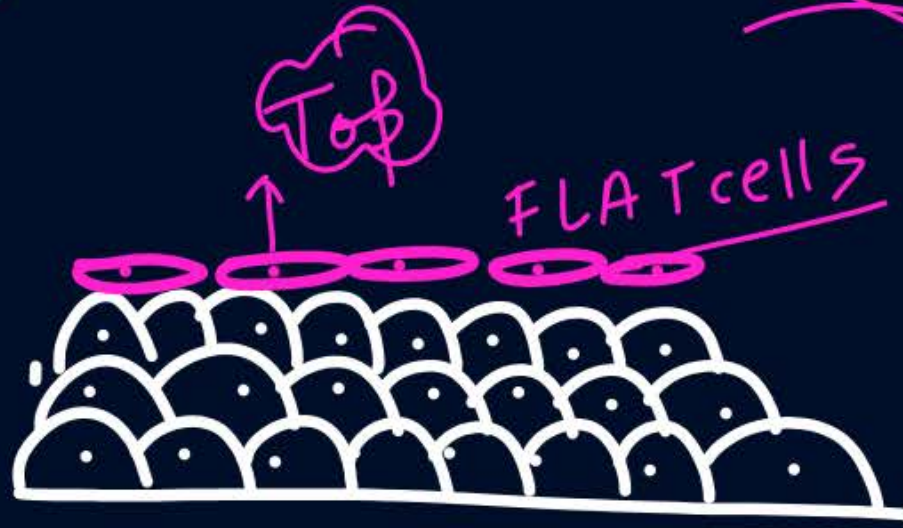
Columnar { Short
Tall



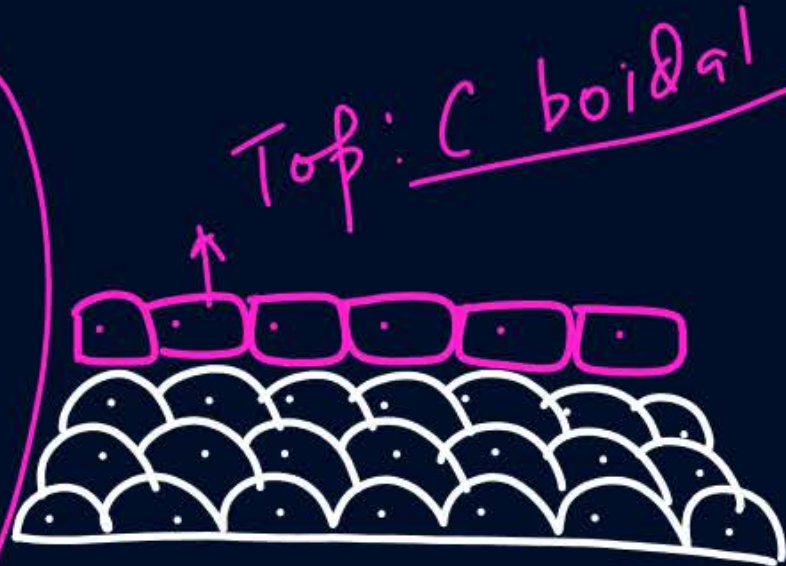
- (A) Only I & II are correct.
- (B) Only II & III are correct.
- (C) Only I & III are correct.
- (D) I, II and III are correct

Extra

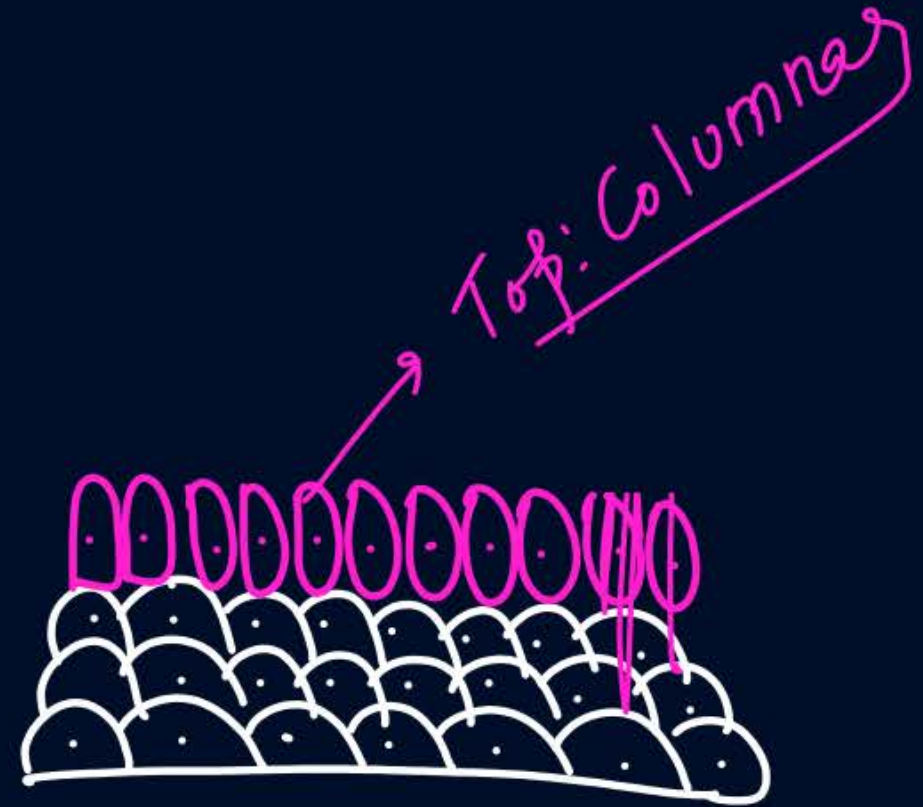
SKIN



Stratified Squamous



Stratified
Cuboidal



Stratified
Columnar

Fill in the blanks by option for the correct combination of A to E

- I. Endocrine glands secrete _____A_____.
- II. The columnar epithelium is composed of a single layer of _____B_____ and _____C_____ cells.
- III. _____D_____ covers dry surfaces of the skin.
- IV. _____E_____ performs cementing to keep neighbouring cells together.

- (A) A-Mucus, B-Cuboidal, C-Flattened, D-Compound epithelium, E-Tight junction
- (B) A-Hormones, B-Tall, C-Slender, D-Compound epithelium, E-Adhering junction
- (C) A-Oil and sweat, B-Oval, C-Round D-Squamous epithelium, E-Gap junction
- (D) A-Saliva, B-Rounded, C-Tall, D-Cuboidal epithelium, E-Mucus

Q-4

2

Directions: In the following questions, a statement of Assertion (A) is followed by a statement of Reason (R). Mark the correct choice as:

Assertion (A): Urinary bladder can considerably expand to accommodate urine.

Reason (R): It is lined by stretchable squamous epithelium.

Transitional

(A) Assertion (A) is true, Reason (R) is true;

Reason (R) is a correct explanation for Assertion (A).

(B) Assertion (A) is true, Reason (R) is true;

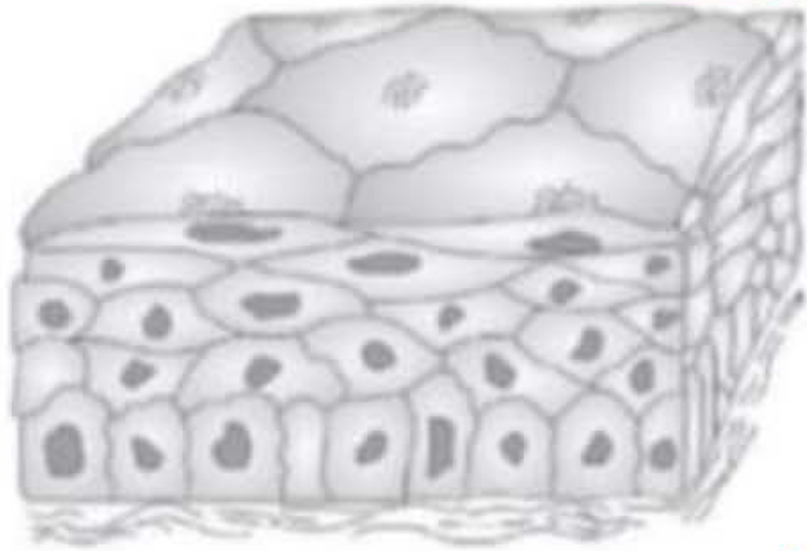
Reason (R) is not a correct explanation for Assertion (A).

(C) Assertion (A) is true, Reason (R) is false.

(D) Assertion (A) is false, Reason (R) is true.

Q-5
C

2 Read the following statements and find out how many of these are related to given figure.



Compound

(A) Multilayered epithelium. ✓

(B) Limited role in secretion and absorption. ✓

(C) Main function is to provide protection against chemical and mechanical stresses. ✓

(D) They cover the dry surface of skin, moist surface of buccal cavity and pharynx. ✓

✓ (A) 4

(B) 3

(C) 2

(D) 1

Q-6
A

Given below are two statements: one is labelled as Assertion A and the other is labelled as Reason R.

Assertion A: The main function of compound epithelium is to provide protection against chemical and mechanical stresses. (T)

Reason R: Compound epithelium is made up of one layer of cells. (F)

In the light of the above statements, choose the **correct** answer from the options given below:

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

Q-7
1

Secretions of exocrine glands does not include

(A) Sebum ✓

(B) Trypsin ✓

(C) Insulin

(D) Sweat ✓

Protein digesting enzyme

Q-8
3

Next Catalyst

Find the correct statement

- (A) Areolar tissue is a loose connective tissue
- (B) Tendon is a specialized connective tissue
- (C) Cartilage is a loose connective tissue
- (D) Adipose tissue is a dense connective tissue

Out of the given tissues, how many are types of connective tissues.

Adipose, bones, skeletal, dense irregular, simple squamous, areolar.

- (A) Two
- (B) Four
- (C) Six
- (D) Five

The cells of areolar tissue that secrete fibres are

- (A) Mast cells (B) Macrophages
- (C) Fibroblasts (D) Chondrocytes

Given below is the diagrammatic sketch of a type of connective tissue.



	Part-A	Part-B	Part-C	Part-D
(1)	Macro-phage	Fibroblast	Collagen fibres	Mast cells
(2)	Mast cell	Macro-Phage	Fibroblast	Collagen fibres
(3)	Macro-phage	Collagen fibres	Fibroblast	Mast cell
(4)	Mast cell	Collagen fibres	Fibroblast	Macro-phage

Identify the parts labelled **A**, **B**, **C** and **D**, and select the **correct** option.

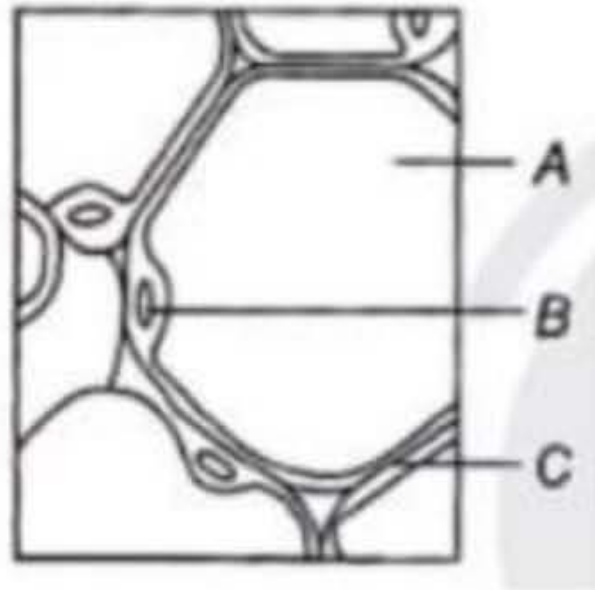
(A) (1)

(B) (2)

(C) (3)

(D) (4)

Identify A, B and C in the given diagram of adipose tissue



- (A) A-Cytoplasm, B-Nucleus, C-Cell wall
- (B) A-Fat storage area, B-Mast cell, C-Plasma membrane
- (C) A-Cell fluid, B-Collagen fibres, C-Plasmalemma
- (D) A-Fat storage area, B-Nucleus, C-Plasma membrane

In the following questions, a statement of

STATEMENT 1-Adipose tissues are specialised to store fats.

STATEMENT 2-The extra nutrients, which are not used immediately by the body get converted into fats.

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.

Directions: In the question two statements are given as statement and statement-II.
Mark the correct choice as:

Statement-I: Epithelial tissues are specialized for linking and connecting other tissues/organs.

Statement-II: Tendon and ligament are the types of dense irregular connective tissues.

- (A) Both Statement-I and Statement-II are correct.
- (B) Both Statement-I and Statement-II are incorrect.
- (C) Statement-I is correct & Statement-II is incorrect.
- (D) Statement-I is incorrect & Statement-II is incorrect.

Samapti Sinha Mahapatra

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Homework

- REVISE CLAASNOTES / ZOOLOGY MED EASY

PRARAMBH EXERCISE 1-25,26,27

PRABAL EXERCISE 2-213,15

THANK
YOU