Subject – Biology Class- 12 Topic – chapter- Integumentary system (21)

Ch: 21 Integumentary System Of Humans

★ Very Short :

1. Which vitamin is synthesized by skin?
Vitamin D

2. Where are meibomian glands found in human body?
These are modified sabaceous glands. It is found in dense connective tissue plate that supports the free edges of each eye lids. It opens into follicles of eye lashes.

3. In humans, milk glands are modified part of which part of skin?
Modified sweat gland.

4. Why is skin called 'the jack of all trades'?
Skin is helpful in protection, temperature regulation, secretion, storage of nutritive materials, skeleton development, stimulus rep reception, excretion, formation of teeth, shape of the body, sexual attraction, locomotion, regeneration etc. That is why it is also called 'Jack of all Trades'.

5. Which pigment gives the colour to skin?

The colour of human skin is due to presence of melanin pigment particles.

6. Dermis originates from which part of body layer?
Embryonic mesoderm.

7. Which protein is found in dermis layer?
Collagen and elastin.

8. Name the oily material found in sebaceous glands.
Cholesterol and vitamin D

9. Write down the names of muscles that activate and operate motion of hair
Arrector pilli muscles.

10. What are rete pegs?
Stratum germinativum or stratum Malphighi is the inner most living layer and composed of single layer of columnar cells. When these cells spread outside the skin, their shape changes from columnar to cuboidal. At many places on this layer, elevation and depression are found. The elevation and is called Rete Pegs.

★ Short Answers:

1. What is keratinization ? Name the organs made from it.
In the outer cells of epidermis, the process of formation of non-living keratin is called keratinization. In human by this process, different organs of external skeleton, such as hair, nail are formed for protection.

2. Write a short note on arrector pili muscles.
These are special muscles made of unstriped muscles fibres. An arrector pili muscles connect each hair with basement membrane of epidermis. When arrector pili muscles contracts it squeezes the oil out from the sebaceous gland which results in erection of the hair. This process is called Goose flesh Nerve fibres are present around muscles.

3. Describe the cutaneous glands associated with eyes and ears.
The cutaneous glands are exocrine because these contain duct which opens on the surface of epidermis. These glands are made by invagination of the Malphighi layer of the dermis.
Cutaneous glands associated with eyes and ears are -
a) Ceruminous glands, b) Meibomian glands
(c) Zeis glands.

Long Answers :-

1. Describe the different part of human skin with diagram.

Human skin is made up of two layers

i) Epidermis – It develops from embryonic ectoderm. It has no blood capillaries and is nourished by dermis which contain blood capillaries. It's thickness differs in different parts of the body. It is thinnest in conjunctive of eyes. The epidermal cells are made up of several layers so it is also called stratified epithelial tissue Epidermis is composed of five layers which are as follows: (From inside to outside)

a) Stratum germinativum or stratum Malphigi – It is the inner most living layer and composed of single layer of columnar cells. At many places on this layer, elevation and depression are found. The elevation is called Rete Pegs. The cells of the layer remain in touch with dermis hence, get nutrition from it. At many places, in between the cells, pigmented cells are present. These cells are called melanocytes, which synthesizes melanin.

b) Stratum spinosum – This is a stratum of six or seven sub layers of cells, which

lies next to the stratum Malphigi. cells of this layer contains microparticles of ketetohyline protein.

c) Stratum granulosum — Outside to stratum spinosum, the cells of 5-6 layers make granulosum layer. The protoplasm of the cells of this layer contains microparticles of ketetohyline protein.

d) Stratum lucidium — 3-4 layers situated outside the stratum granulosum are made up of flat cells. The protoplasm of these cells eleidin substance is filled which is formed due to decomposition of keretohyline. In these the keratohyaline, granule first dissolve and then transform into a protein, eleidin, which is semi-transparent and water proof and acts as a barrier layer.

e) Stratum Corneum — It is the outermost layer of epidermis with 99% dead cells. The dead cells dies because of keratinization and cornification. Cells of this layer are thickest as it is composed of 8-10 layers of cells. It is thick in palm and sole.
Stratum corneum undergoes periodic shedding in pieces, the process is known as ecdysis.

ii) Dermis — It is the internal part of skin developed from the embryonic mesoderm. It is located below epidermis and is almost 2-3 times thicker than epidermis. It is strong and

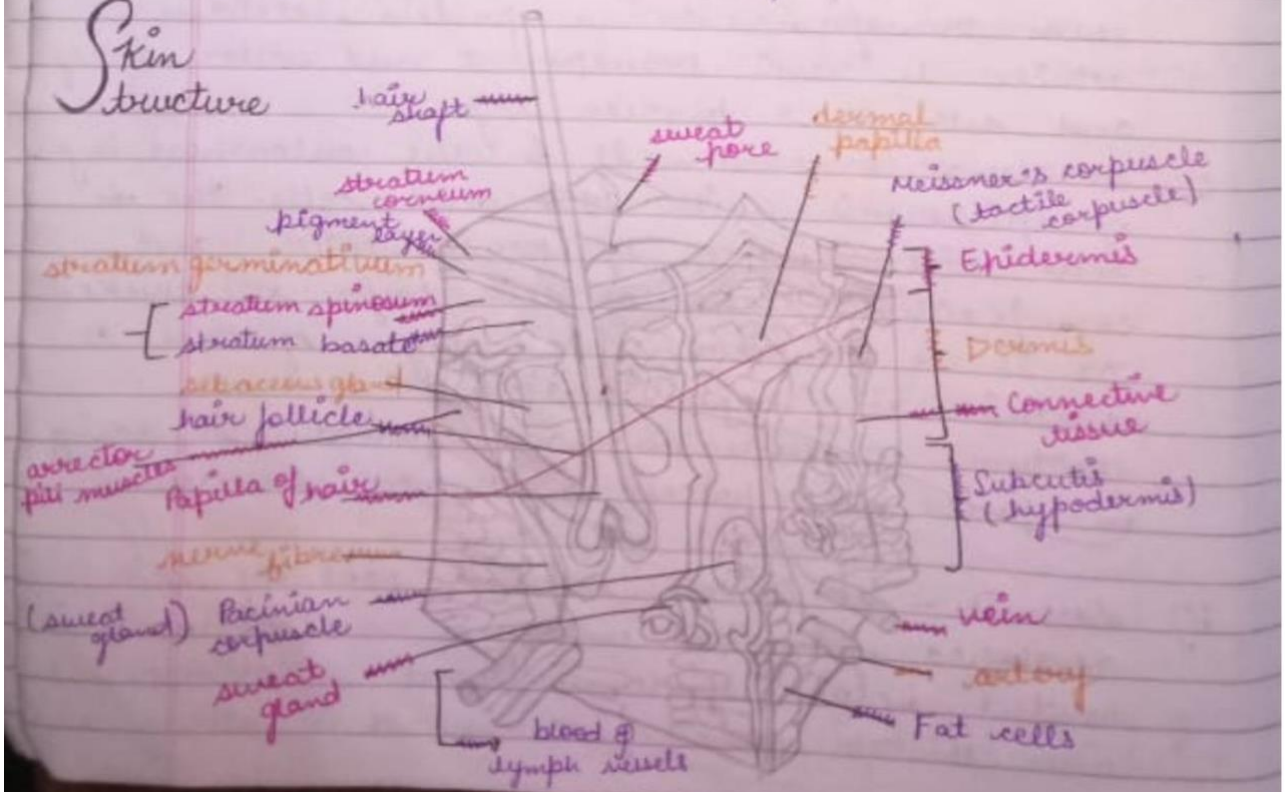
flexible part. In it white collagen fibres, white elastic fibres and unstriated muscles fibers blood vessels, nerves, receptors, skin glands, hair follicles are found.

Dermis is composed of two layers:

a) Papillary layer – It is outer thin layer. This layer at many places remains embedded in epidermis called dermal papilla. Collagen fibres are less in this layer.

b) Reticular layer – Reticular layer is thicker in comparison to papillary layer. In this layer skin glands, hair follicles receptors and adipose tissue are found. This layer keeps the skin well shaped.

Skin structure



i) Cuticle – It is the outer most layer and is mostly thin and unicellular. Heavily keratinized overlapping cells are found having their free ends directed upwards.

ii) Cortex – It is the middle layer with several layers of cells. The cell of this layer contain pigment particles in between which gives colour to the hair.

iii) Medulla – This is the innermost and main part. It contains adjoining polyhedral cells. These cells form the axis of hair.

(e) Arrector pili muscles – An arrector pili muscles connect each hair with basement membrane of epidermis. When arrector pili contracts it sequeezes the oil out from the sebaceous gland which result in erection of the hair. This process is called Goose flesh.

2. Cutaneous glands –
These glands are following types :

(a) Sweat glands
(b) Sebaceous glands
(c) Mammary glands
(d) Seruminous glands
(e) Perineal glands or inguinal glands.
(f) Meibomian glands
(g) Zeis glands

2. What are the derivatives of human skin? Describe.

Special structures are found in human skin which are called the derivatives of skin. Derivatives of skin include:

1. Hair – Hair are characteristic feature of mammals. It develops as a thickening of the stratum germinativum of the epidermis. Each hair lies in a tubular pit called hair follicle.

Hair comprises following structures:

a) Hair follicle – The basal part of hair is sunken in dermis and forms a bag like structure. This bag like structure is called hair follicle.

b) Hair root – Hair root is slightly bulged called hair bulb. The cells of the hair follicles bulb ~~the~~ just above hair papilla are living and divisible and are called germinal matrix of hair. Due to division in these cells, hair increases in size.

(c) Hair papilla – The basal part of the hair invaginates inward to form hair papilla. Within hair papilla bunch of blood capillaries and nerve fibres are found. It nourishes root.

(d) Hair shaft – The part of hair which comes out of epidermis is called hair shaft. It is dead due to keratinization of the cells reaching up to this part. It has three layer

3. Briefly describe the different glands found in human skin.

Cutaneous glands – The cutaneous glands are exocrine because these contain duct which opens on the surface of epidermis. These glands are made by invagination of the Malphigi layer of the dermis.

Cutaneous glands are following types :

(a) Sweat glands – Sweat glands are simple and tubular glands, located in deeper zone of dermis. These glands secreat the sweat which contains water, several salt, urea and some CO_2. That's why, sweat is salty in taste.

Sweat glands are found largest in number in palms, soles and armpits.

The main function of sweat glands are thermoregulation, excretion and water balance.

(b) Sebaceous glands – Sebaceous glands are also called as oil glands. It generally remain associated with hair follicle. It secretes sebum which makes the skin and hair water proof. These glands are found all over the body parts but are absent in palms and sole.

(c) Mammary glands – Mammary glands is modified sweat gland. In human these glands are found in thoracic region. It is

characteristic feature of mammal, present in both sex. In females, it nourishes the baby. The growth of mammary glands is controlled by estrogen and polegesterone and milk secretion by oxytocin in hormone.

(d) Seruminous glands - These are located in the skin of external auditory canal. These are modified sebaceous glands and holocrine in nature. It secretes cerumin, which is called as earwax.
The cerumin protects the tympanum.

(e) Perineal glands or inguinal glands - Thes glands are found around the anus of rabbit and release certain thin liquid of typical smell which attracts animal of opposite sex. So these are also called as scent glands.

(f) Meibomian glands - These are modified sebaceous glands. It opens into follicles of eye lashes. It produces oily secretion which keeps the cornea moist and prevent from getting dried. It forms a thin film over the layer of lacrimal glands.

(g) Zeis glands - These are modified sebaceous glands, found in the eye lashes. Its secretion keeps eyelashes smooth.

4. Why the skin is called 'jack of all trades' organ ? Write a descriptive short note on it

Functions of Skin

1. Protection — It protects the body from external injuries, fraction etc. It also checks the entry of harmful bacteria, worms, fungi etc. and protects us from them. Melanin of epidermis gives protection against UV rays of sun.
2. Temperature regulation of body — Human is homeothermic. The temperature of a healthy human remains 98.4° F. This temperature is maintained in all seasons. The sweat cools the skin. Temperature regulation is controlled under the directions of thermostate centre of hypothalamus gland.
3. Shape of the body — Skin helps in maintaining the figure of the body.
4. Storage of food material — The adipose tissue of the skin act as a region of food storage.
5. Secretion of useful substances — Important glands present in skin secrete useful substances like oil, earwax, milk and vitamin D etc.
6. Excretion — Skin removes excess of water, lactic acid, traces of urea and some salt like NaCl from the blood as sweat.

7. Locomotion — Due to flexibility, it is helpful in locomotion.
8. Skeleton formation — Membranous bones are developed from the connective tissue of dermis.
9. Absorption — Skin is permeable to oil and other substances, thus it helps in absorption of substances.
10. Reception of stimuli — Sense organs present in the dermis of the skin respond to stimulus.
11. Formation of teeth — Some parts of the teeth are formed by the dermis of the skin. Teeth are helpful in chewing food.
12. Sexual attraction — The colour of the hair present in skin, dressing and scented material secreted by glands are helpful for sexual attraction.
13. Regeneration — Epidermis of the skin has great capability of healing the wound by regeneration, at the time of injury.

In a body skin performs many important function, therefore it is called the "Jack of all Trades".