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PAPER
PHYSIOLOGY

Discipline BS (RAD)

Q1: What is pituitary gland? Explain different lobes and hormones release from it?

A: The pituitary gland is a small, bean shaped gland situated at the base of brain, so behind the nose and the ears. Despite its small size, the gland influences nearly every part of the body. The hormones it produces help regulate important functions, such as growth, blood pressure and reproduction.

The pituitary has two lobes, the anterior and the posterior lobe, each of two lobes of the pituitary gland contains different types of cells and produces

different types of ^xcells hormones-

Anterior Lobe:

- * Growth hormone (GH)
- * prolactin
- * Thyroid stimulating hormone
- * Adrenocorticotrophic hormone
- * Follicle stimulating hormone
- * Luteinizing hormone

Posterior Lobe:

- * Vasopressin (ADH)
- * oxytocin

1) Growth Hormone

Action of growth hormone

- 1 Stimulating of growth of bones, cartilage and connective tissue.
- > Increase calcium absorption
- Decrease sodium, potassium, phosphorus excretion from kidney.

Diseases related to growth Hormone

1. Gigantism:- It is due to overproduction of GH.

- Tall Stature
- large hand and feet.

2. Dwarfism:- Deficiency of GH secretion

- shortness of stature
- small genitalia
- delicate extremities.

2) Prolactin:-

Action of prolactin

Prolactin plays an important role in the development of mammary gland and in milk synthesis.

3) Thyroid-stimulating hormone

it stimulates the thyroid gland to produce

Thyroxin (T_4) and
Triiodothyronine (T_3)

4) Adrenocorticotrophic Hormone

it is often produced in biological stress

its principal effects are production and release of corticosteroids.

5) Follicle Stimulating Hormone

FSH regulates the development pubertal maturation and reprod process of the body.

1) Luteinizing hormone

In females, an acute rise of LH triggers ovulation.

In males, it stimulates the production of testosterone.

Hormones of posterior pituitary

1) Anti-diuretic hormone (ADH) / Vasopressin
To retain water in the body.

2) Oxytocin

Oxytocin is synthesized in the hypothalamus

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Action of oxytocin

→ Oxytocin stimulates contraction of mammary gland to produce milk.

→ stimulate contraction of muscles of the uterus.

Q: Write a difference between Appendicular and Axial skeleton?

A The axial skeleton forms the vertical axis of the body and includes the bones of the head, neck, back and chest of the body. It consists of 80 bones.

that include the skull, vertebral column, and the thoracic cage.

- The appendicular skeleton consists of 126 bones and includes all bones of the upper and lower limbs.
- The appendicular skeleton includes all the bones that form the upper and lower limbs, and the shoulder and pelvic girdles.

The axial skeleton includes all the bones along the body's long axis. Let's work our way down this axis. Learn about these structures and the bones that form them.

- In terms of function the axial skeleton provides protection for the vital organs such as the rib cage protecting the heart and the lungs. The appendicular skeleton allows for movement and is what skeletal muscle attaches to.

Q3: What is muscular tissue? Explain different types of muscles;

A:- Muscle tissue is a soft tissue that composes muscles in animal bodies, and gives rise to muscles' ability to contract. This is opposed to other components or tissues in muscle such as tendons or perimysium. It is formed during embryonic

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development through a process known as myogenesis. muscle tissue consists of elongated cells also called as muscle fibers. This tissue is responsible for movements in our body. muscles contain special proteins called contractile protein which contract and relax to cause movement.

Muscular cells are called muscle fibers. Every fiber contains thousand of myofibrils. Inside each myofibril there are many myofilaments that are made of two proteins:

the actin and the myosin.

The myofibrils are divided in subunits called sarcomeres.

Types of muscles

There are three types of muscles:

* skeletal muscle

b cardiac muscle

* smooth muscle

1) Skeletal muscle

- The skeletal muscles are also known as striated or voluntary.

- They are attached to bones by tendons, providing movement.

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Their contraction is quick and variable from powerful to precise. It is controlled by the CNS.

Cardiac muscle

- Cardiac muscle is only found in the heart.
- it is made of striated fibers and its contraction is directed by the ANS.
- it contracts involuntarily and rhythmically. It's also very resistant to fatigue due to the large number of mitochondria they have.

Smooth muscle

- Smooth muscle are also known as involuntary as its contraction is lead by the CNS and the glands.
- it covers the hollow walls of many organs such as the oesophagus, the bronchi, the uterus or the stomach. It contracts slowly.

Q4:- Write a note on cycle of Breathing?

Cycle of Breathing

The average respiratory rate is 12 to 15 breaths/minute

- Each breath consists of two phases.
 - 1) Inspiration
 - 2) Expiration

Inspiration

When the capacity of the thoracic cavity is increased by simultaneous contraction of the intercostal muscles and the diaphragm.

The parietal pleura moves with the walls of the thorax & the diaphragm.

- This reduces the pressure in the pleural cavity to a level considerably lower than atmospheric pressure.
- The visceral pleura follows the parietal pleura, pulling the lungs with it.
- This expands the lungs and the pressure within the alveoli and in the air passages drawing air into the lungs in attempt to equalise the

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atmospheric and alveolar air pressure

When we breathe in (inspiration) the following happens:

- The diaphragm pulls down
- The intercostal muscles contract
- Air pressure is reduced.
- Air is inhaled into the lungs
- The chest expands.

The process of inspiration is Active, as it needs energy for muscle contraction.

Inspiration lasts about 2 seconds.

Expiration

- Relaxation of the intercostal muscles and the diaphragm results in downward and inward movement of the rib cage and elastic recoil of the lungs.
- As this occurs, pressure inside the lungs exceeds that in the atmosphere and so air is expelled from respiratory tract.
- The still contain some air & are prevented from collapse by the intact pleura.

This process is PASSIVE as it does not require the expenditure of energy.

When we breathe out (expiration) the opposite happens:

- * The diaphragm relaxes into its dome position.
- * The intercostal muscles relax.
- * The chest becomes smaller.
- * Pressure increases in the lungs.
- * Air is forced out.

Q:- Write a detail note on Function of integumentary system;

- Protection
 - First line of defense against Bacteria
 - viruses
 - Protects underlying structures from ultraviolet (UV) radiation
 - Dehydration
 - Vitamin D production
 - Needed ~~from~~ calcium absorption
 - Sensation
 - Sensory receptors.

Body temperature regulation
if too hot

Dermal blood vessels dilate
vessels carry more blood to surface so
heat can escape

if too cold

Dermal blood vessels constrict
prevents heat from escaping

Excretion

Small amount of waste products are
lost through perspiration.

The integumentary system comprises the skin and its appendages acting to protect the body from various kinds of damage, such as loss of water or damages from outside. The integumentary system includes hair, scales, feathers, hooves, and nails. It has a variety of additional functions: it may serve to waterproof, and protect the deeper tissues, excrete wastes, and regulate body temperature, and is the attachment site for sensory receptors to detect pain, sensation, pressure, and temperature. In most land vertebrates with significant exposure to sunlight, the integumentary system also provides for vitamin D synthesis.

Structure of the Skin

Understanding how the skin can function in these many ways starts with understanding the structure of the 3 layers of skin.

- * The Epidermis
Epithelial tissue
- * Dermis
Dense connective tissue proper - irregular
- * Hypodermis
Subcutaneous tissue - loose connective tissue proper and adipose tissue

Hair Function

Head:

UV protection
cushion from trauma
Insulation

Nostrils, Ear canals Eyelashes
prevent entry of foreign material

Body Hair
sensory detection

Root hair plexus

sensory nerves at base of hair
Follicle that detect slight movement of hair.

Arrector pili muscle

Attached to every hair follicle
contract to stand hair perpendicular to skin surface

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Function of Nail

Nails

- protect fingers and toes
- made of dead cells packed with keratin
- metabolic disorders can change nail structure

Nail production

occurs in a deep epidermal fold near the bone called the nail root.

The End.

