**Final-Term Assignment**

**Course Title: Human Physiology I**

**DT plus Rad 1st semester**

**Instructor: Dr. M .Shahzeb khan (PT)**

**Marks: 50**

**Note:**

* **Attempt all questions, all questions carry equal marks.**
* **Answer Briefly and to the point, avoid un-necessary details**

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

**Pituitary gland:**

The major endocrine gland, a pea-sized body attached to the base of the brain that is important in controlling growth and development and the functioning of the other endocrine glands.The pituitary gland is about the size of a pea and is situated in a bony hollow, just behind the bridge of your nose. It is attached to the base of your brain by a thin stalk. The pituitary gland is often called the master gland because it controls several other hormone glands in your body, including the thyroid and adrenals, the ovaries and testicles.

The pituitary has two lobes, the anterior and the posterior lobe. Each of the two lobes of the pituitary gland contains different types of cells and produces different types of hormones. The posterior lobe produces two hormones, vasopressin and oxytocin.

Q2: Write a difference between Appendicular and Axial skeleton.

**Appendicular System:**

The appendicular system is formed by the bones of pectoral girdle, pelvic girdle and upper and lower limbs.The appendicular skeleton includes the skeletal elements within the limbs, as well as supporting shoulder girdle pectoral and pelvic girdle. The word appendicular is the adjective of the noun appendage, which itself means a part that is joined to something larger.The appendicular skeleton of 126 bones.

The appendicular skeleton forms during development from [cartilage](https://en.wikipedia.org/wiki/Cartilage), by the process of [endochondral ossification](https://en.wikipedia.org/wiki/Endochondral_ossification" \o "Endochondral ossification).

The appendicular skeleton is divided into six major regions:

1. Shoulder gridles (4 bones) - Left and right  clavicle (2) and scapula (2).
2. Arms and forearms (6 bones) - Left and right humerus (2) (arm), ulna (2) and radius (2) (forearm).
3. Hands (54 bones) - Left and right carpals  (16) (wrist), metacarpals  (10), [proximal phalanges](https://en.wikipedia.org/wiki/Proximal_phalanges) (10), [intermediate phalanges](https://en.wikipedia.org/wiki/Intermediate_phalanges) (8) and [distal phalanges](https://en.wikipedia.org/wiki/Distal_phalanges) (10).
4. [Pelvis](https://en.wikipedia.org/wiki/Human_pelvis) (6 bones) - Ilium (2), Ischium (2) and Pubis (2).
5. Thighs and legs (8 bones) - Left and right [femur](https://en.wikipedia.org/wiki/Femur) (2) (thigh), [patella](https://en.wikipedia.org/wiki/Patella) (2) (knee), [tibia](https://en.wikipedia.org/wiki/Tibia) (2) and [fibula](https://en.wikipedia.org/wiki/Fibula) (2) (leg).
6. Feet and ankles (52 bones) - Left and right [tarsals](https://en.wikipedia.org/wiki/Tarsus_(skeleton)) (14) (ankle), [metatarsals](https://en.wikipedia.org/wiki/Metatarsals) (10), [proximal phalanges](https://en.wikipedia.org/wiki/Proximal_phalanges) (10), [intermediate phalanges](https://en.wikipedia.org/wiki/Intermediate_phalanges) (8) and [distal phalanges](https://en.wikipedia.org/wiki/Distal_phalanges) (10).

It is important to realize that through [anatomical variation](https://en.wikipedia.org/wiki/Anatomical_variation) it is common for the skeleton to have many [accessory bones](https://en.wikipedia.org/wiki/Accessory_bone) ([sutural](https://en.wikipedia.org/wiki/Sutural" \o "Sutural) bones in the skull, [cervical ribs](https://en.wikipedia.org/wiki/Cervical_rib), [lumbar](https://en.wikipedia.org/wiki/Lumbar) ribs and even extra lumbar vertebrae).

**Axial System:**

The Axial System is made up with the Skull bones, the Vertebrae, the Ribs and the Sternum.the axial skeleton of 80 bones.The axial skeleton is the part of the skeleton that consists of the bones of the head and trunk of a vertebrate. In the human skeleton, it consists of 86 bones and is composed of six parts; the skull (22 bones), the ossicles of the middle ear, the hyoid bone, the rib cage, sternum and the vertebral column. The spine is divided into several sections. The cervical vertebrae make up the neck. The thoracic vertebrae comprise the chest section and have ribs attached. The lumbar vertebrae are the remaining vertebrae below the last thoracic bone and the top of the sacrum. The sacral vertebrae are caged within the bones of the pelvis, and the coccyx represents the terminal vertebrae or vestigial tail.

Q3: What is Muscular tissue? Explain different Types of muscles.

**Muscular tissue** :

Muscle tissue is composed of cells that have the special ability to shorten or contract in order to produce movement of the body parts. The tissue is highly cellular and is well supplied with blood vessels.

**Types of Muscles:** The 3 types of muscle tissue are cardiac, smooth, and skeletal. Cardiac muscle cells are located in the walls of the heart, appear striated, and are under involuntary control. Smooth muscle fibers are located in walls of hollow visceral organs, except the heart, appear spindle-shaped, and are also under involuntary control. Skeletal muscle fibers occur in muscles which are attached to the skeleton. They are striated in appearance and are under voluntary control.

In the muscular system, muscle tissue is categorized into three distinct types: skeletal, cardiac, and smooth. Each type of muscle tissue in the human body has a unique structure and a specific role. Skeletal muscle moves bones and other structures. Cardiac muscle contracts the heart to pump blood. The smooth muscle tissue that forms organs like the stomach and bladder changes shape to facilitate bodily functions. Here are more details about the structure and function of each type of muscle tissue in the human muscular system.

Q4: Write a note on Cycle of Breathing.

* The average respiratory rate is 12 to 15 breaths/minute.
* Each breath consists of two phases:
* Inspiration
* 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 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.
* They still contain some air & are prevented from collapse by the intact pleura.
* This process is PASSIVEas 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.

Q5: Write a detail note on Function of Integumentary system.

**Function of integumentary system**:

* **Protection:**
* **First line of defense against**
* Bacteria
* Viruses
* **Protects underlying structures from**
* Ultraviolet (UV) radiation
* Dehydration
* **Vitamin D production**
* Needed for 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 amounts of waste products are lost through perspiration

**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 fucntion**

* **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 sligh movement of hair
* **Arrector pili muscle**:
* Attached to every hair follicle
* Contract to stand hair perpendicular to skin surface.