



WINTER- 14 EXAMINATION

Subject Code: 17436

Model Answer

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**Important Instructions to examiners:**

- 1) The answers should be examined by key words and not as word-to-word as given in the model answer scheme.
- 2) The model answer and the answer written by candidate may vary but the examiner may try to assess the understanding level of the candidate.
- 3) The language errors such as grammatical, spelling errors should not be given more Importance (Not applicable for subject English and Communication Skills).
- 4) While assessing figures, examiner may give credit for principal components indicated in the figure. The figures drawn by candidate and model answer may vary. The examiner may give credit for any equivalent figure drawn.
- 5) Credits may be given step wise for numerical problems. In some cases, the assumed constant values may vary and there may be some difference in the candidate's answers and model answer.
- 6) In case of some questions credit may be given by judgement on part of examiner of relevant answer based on candidate's understanding.
- 7) For programming language papers, credit may be given to any other program based on equivalent concept.



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Model Answer

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Q.1 Solve any five

20marks

a) Define cell and mention organelles of cell.

( Definition :02 Marks. List organelles of cell any four : 02 Mark)

**Ans.** The cell is the smallest unit of living tissues.

Organelles cell.

1. Endoplasmic reticulum.
2. Goli apparatus.
3. Mitochondria.
4. Lysosomes.
5. Centrosome.
6. Microtubules.

b) Describe cell electrophysiology repolarization.(4marks)

Ans: -

- cells at rest are considered polarized, meaning no electrical activity takes place.
- The cell membrane of muscle cell separates different concentrations of ions, such as sodium, potassium, and calcium. This is called the resting potential
- Electrical impulses are generated by automaticity of specialized cardiac cells
- Once an electrical cell generates an electrical impulse, this electrical impulse causes the ions to cross the cell membrane and causes the action potential, also called depolarization
- The movement of ions across the cell membrane through sodium, potassium and calcium channels, is the drive that causes contraction cells/muscle
- Depolarization with corresponding contraction of myocardial muscle moves
- Repolarization is the return of the ions to their previous resting state, which corresponds with relaxation of the myocardial muscle
- Depolarization and repolarization are electrical activities which cause muscular activity
- The action potential curve shows the electrical changes in the myocardial cell during the depolarization – repolarization cycle



c) Name the different types of tissue. (4 Marks)

**Ans.**-Tissues are classified into four major groups. They are:

1. Epithelial tissue
2. Connective tissue
3. Muscular tissue
4. Nervous tissue

d) Describe Nervous tissue and state its function.

( Description :02 Marks. List function any two : 02 Mark)

**Ans:** -Nervous tissue is specialized to react to stimuli and to conduct impulses to various organs in the body which bring about a response to the stimulus. The properties of irritability and conductivity are specially developed in the nervous tissue.

**Functions of Nerve Tissue**

1. Nervous tissue allows an organism to sense stimuli in both the internal and external environment.
2. The stimuli are analyzed and integrated to provide appropriate, co-ordinated responses in various organs.
3. The afferent or sensory neurons conduct nerve impulses from the sense organs and receptors to the central nervous system.
4. Internuncial or connector neurons supply the connection between the afferent and efferent neurons as well as different parts of the central nervous system.
5. Efferent or somatic motor neurons transmit the impulse from the central nervous system to a muscle (the effector organ) which then react to the initial stimulus.
6. Autonomic motor or efferent neurons transmit impulses to the involuntary muscles and glands

e) State the functions of male hormones. (Any 4)

**Ans:** - 1. Maintaining libido.

2. Sperm production.
3. Maintaining muscle strength and mass.
4. Promoting healthy bone density.
5. Maintaining secondary sexual character.

f) What are the connective tissues? (4 marks)

**Ans :-**Connective tissues serve to connect or bind together different organs or different parts of an organ. They contain an intercellular substance called matrix. It helps in binding and supporting the cells. Connective tissues are classified as:



1. Areolar tissue (loose connective tissue)
2. Dense fibrous tissue
3. Adipose tissue (Fatty tissue)
4. Cartilage
5. Bone

**g) List the instruments related to heart.**

**(List any four: 1 Mark each= 04 Mark)**

**Ans:** -The instruments related to heart are given below:

1. ECG machine.
2. Defibrillator.
3. Pacemaker.
4. Heart lung machine.
5. Heart rate meter.
6. Phonocardiograph.
7. Sphygmomanometer.

**(h) Name different organs of respiratory system.**

**(List any four: 1 Mark each= 04 Mark)**

**Ans:** - The respiratory system consists of following organs.

1. Nasal cavity
2. Pharynx
3. Larynx
4. Trachea
5. Bronchi
6. Bronchioles
7. Alveoli
8. Lungs.



**i) List of instrument related to digestive system.**

**(List any four: 1 Mark each= 04 Mark)**

**Ans :-**The instrument related to digestive system are

- |                |                 |
|----------------|-----------------|
| 1)Endoscope.   | 6)Ultrasound    |
| 2)Laparoscope. | 7)Sigmoidoscopy |
| 3)X-RAY.       | 8)MRI           |
| 4)Colonoscopy. |                 |
| 5)CT           |                 |

**j) List of instrument related to nervous system.**

**(List any four: 1 Mark each= 04 Mark)**

**Ans: -** The instruments related to nervous system are

1. Electroencephalograph
2. CT
3. MRI
4. Nerve muscle stimulator.

**k) List the endocrine glands.**

**(List any four: 1 Mark each= 04 Mark)**

**Ans :-**The following are the endocrine glands present in the body.

1. Pituitary gland.
2. Thyroid gland.
3. Parathyroid gland.
4. Adrenal glands (suprarenal glands)
5. Pancreas.
6. Ovaries
7. Testis
8. Pineal

2. Solve any two:

16

a) Classify the blood groups and explain the term universal donor and universal recipient.

( Classification :02 Mark, universal donor:01 Mark,universal recipient:01 Mark)

**Ans:** -There are four major blood groups determined by the presence or absence of two antigens – A and B – on the surface of red blood cells:

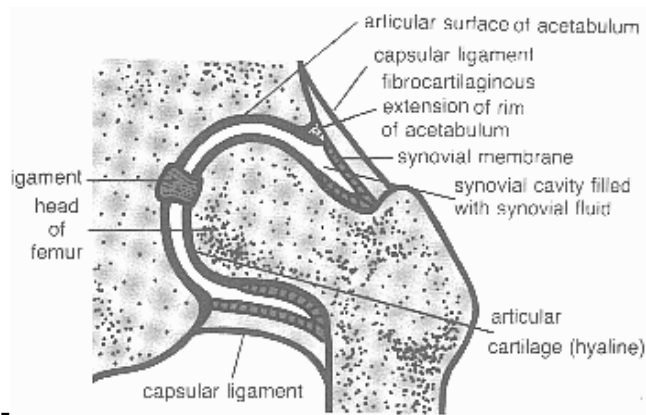
- **Group A** – has only the A antigen in red cells (and B antibody in the plasma)
- **Group B** – has only the B antigen in red cells (and A antibody in the plasma)
- **Group AB** – has both A and B antigens in red cells (but neither A nor B antibody in the plasma)
- **Group O** – has neither A nor B antigens in red cells (but both A and B antibody are in the plasma)

**Universal donor:** Type O– blood is considered the “universal donor” because it can be donated to people of any blood type.

**Universal recipient:** Type AB+ blood is considered the “universal recipient” because people with this type can receive any blood type.

b) Describe ball and socket joints and draw a well label diagram of ball and socket joint.

(Diagram:2 marks, Description:2 marks)



These joints are formed where the rounded head of one bone fits into the hollow, cup-shaped socket of another bone such as the shoulder joint and the hip joint. Such joints allow freedom of movement in all directions. This type of joint allows the bone to move in a 360° angle—with more freedom than other joints.

Ball-and-socket joints are classified functionally as multiaxial joints because they can move bones along several axes. The muscles that surround the joints permit the humerus and femur to move away from the body’s midline (abduction), toward the body’s midline (adduction), forward (flexion), and backwards (extension). The humerus and femur can also move around the joint in a full circle (circumduction) as well as rotate both medially and laterally around their axis. Other parts of the body, such as the wrist and ankles, require at least two separate joints working together to achieve all of the movements of the ball-and-socket joints.

c) Describe the actions of oestrogens & progesterone.

(Estrogen:2 marks, Progesterone:2 marks)

**Ans: Estrogen action:** Estrogens are present in significant amounts in both men and women. They are present significantly higher amounts in women after menarch (onset of menstrual puberty) until menopause (cessation of menstrual periods after completion of reproductive age). The primary function of estrogen is development of female secondary sexual characteristics. This includes breast, endometrial, regulation of menstrual cycle, etc. In male estrogen helps in maturation of the sperm and maintains of healthy libido. It helps to decelerate height increase in puberty in females, accelerate burning of body fats and muscle bulk, increases uterine growth, improves the lubrication of vagina, and thickens the vaginal wall.

**Progesterone action:** progesterone is hormone secreted by the female reproductive system. Its main function is to thickening the inner lining of the uterus. Progesterone is produced by ovaries, placenta and adrenal glands.  
Progesterone Action in the Breast:

- A. Effect of progesterone on proliferation of the normal breast
- B. Progesterone regulation of genes associated with cell cycle progression
- C. Progesterone regulation of growth factors and growth factor receptors in the breast
- D. Markers of progestin action in the breast
- E. Progesterone effects on lactation

Q3. Attempt any TWO:

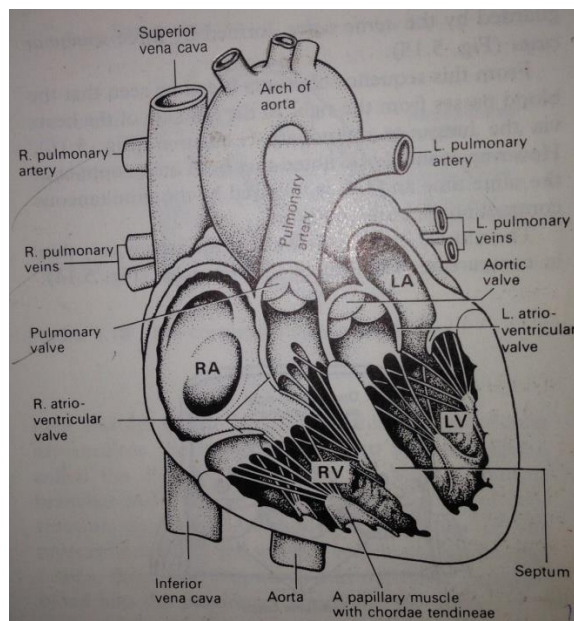
16

a) Draw well labeled diagram of internal structure of heart, describe external structure of heart.

(Diagram:4 marks, Description:4 marks)

Answer:

Internal structure of heart diagram:





The heart is a muscular organ which pumps blood through the blood vessels of the circulatory system. The heart is located in the middle compartment of the mediastinum in the chest. The heart is divided into four chambers: upper left and right atria; and lower left and right ventricles.

The heart is situated in the middle of the mediastinum behind the breastbone in the chest, at the level of thoracic vertebrae T5-T8. The largest part of the heart is usually slightly offset to the left. The heart is supplied by the coronary circulation and is enclosed in the pericardial sac.

The pericardium encloses the heart and also attaches to the mediastinum via the pericardiac pleura, providing anchorage for the heart. The back surface of the heart lies near to the vertebral column, and the front surface sits deep to the sternum and costal cartilages. The two great veins, the venae cavae, and the great arteries, the aorta and pulmonary trunk, are attached to the upper surface of the heart, called the base, which is located at the level of the third costal cartilage. The lower tip of the heart, the apex, lies just to the left of the sternum between the junction of the fourth and fifth ribs near their articulation with the costal cartilages. The right side of the heart is deflected forwards, and the left side is deflected to the back. The shape of the heart is similar to a pinecone at the base and tapering to the apex. An adult heart has a mass of 250–350 grams. The heart is typically the size of a fist: 12 cm (5 in) in length, 8 cm (3.5 in) wide, and 6 cm (2.5 in) in thickness.

**b) What is blood pressure? How it is recorded?**

**(Explanation:4marks,Recording procedure:4 marks)**

**Answer:**

Blood pressure may be defined as the force or pressure which the blood exerts on the wall of the blood vessels.

The normal arterial pressure is: 110-120 mmHg systolic and 65-80 mmHg diastolic and it is given as follows

BP=120/80 mmHg

The auscultatory method of BP measurement uses a stethoscope and a sphygmomanometer. This comprises an inflatable cuff placed around the upper arm at roughly the same vertical height as the heart, attached to a mercury or aneroid manometer.

A cuff of appropriate size is fitted smoothly and also snugly, and then inflated manually by repeatedly squeezing a rubber bulb until the artery is completely occluded. Listening with the stethoscope to the brachial artery at the elbow, the examiner slowly releases the pressure in the cuff. When blood just starts to flow in the artery, the turbulent flow creates a "whooshing" or pounding (first Korotkoff sound). The pressure at which this sound is first heard is the systolic blood pressure. The cuff pressure is further released until no sound can be heard (fifth Korotkoff sound), at the diastolic arterial pressure.

**C) Describe the mechanism of respiration.**

**(Inspiration:4 marks, Expiration:4 marks)**

**Answer:**

This occurs 12 to 15 times per minute and it consists of two phases:

- Inspiration
- Expiration



### Inspiration:

When the capacity of the thoracic cavity is increased by simultaneous contraction of the intercostals muscles and diaphragm, the partial pleura moves with the walls of the thorax and the diaphragm. This reduces the pressure in the pleural cavity to a level considerably lower than atmospheric pressure. The visceral pleura follow the partial pleura. During this process the lungs are stretched and the pressure within the alveoli and in the air passage is reduced, drawing air into the lungs in an attempt to equalize the atmospheric and alveolar air pressure. The process of inspiration is active, as it requires expenditure of energy for muscle contraction.

### Expiration:

Relaxation of intercostals muscles and the diaphragm results in downward and inward movement of the rib cage and elastic recoil of the lungs. As this occurs, the pressure of gases inside the thorax exceeds that in the atmosphere and therefore air is expelled from the respiratory tract. The lungs will contain some air and are prevented from complete collapse by the intact pleura. This process is passive as it does not require the expenditure of energy.

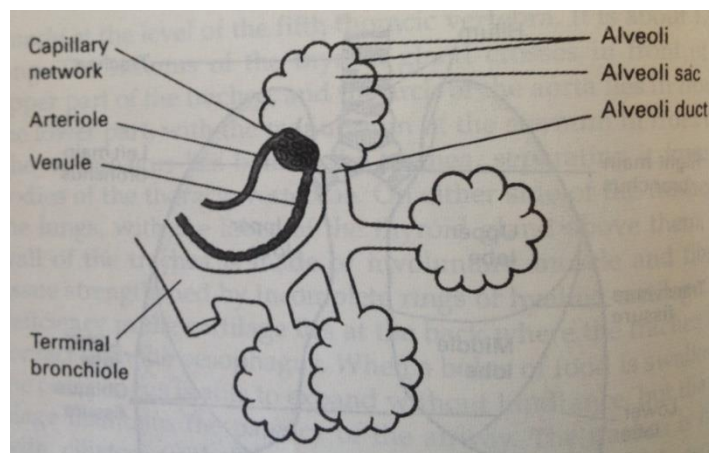
### Q4. Solve any TWO:

16

#### a) Describe Alveoli of lungs. (8 marks)

#### Answer:

Terminal bronchiole, which supplies air to the lobules of lung, divides and subdivides into alveolar ducts and alveoli (tiny air sacs). There are about 150 million alveoli in adult lung. As airways progressively divide and become smaller and smaller, their walls gradually become thinner until muscle and connective tissue disappear, leaving a single layer of simple squamous epithelial cells in the alveolar ducts and alveoli. A loose network of elastic connective tissue in which macrophages, fibroblasts, nerves and blood supports these distal respiratory passages and lymph vessels are embedded. A dense network of capillaries surrounds the alveoli. Exchange of gases in the lung (external respiration) takes place across a membrane made up of the alveolar wall and the capillary wall fused firmly together. This is called the respiratory membrane. Lying between the squamous cells are septal cells that secrete surfactant, a phospholipids fluid, which prevents the alveoli from drying out and reduces surface tension preventing alveolar collapse during expiration.





**b) Explain the functions of endocrine glands. ( 8 marks for any 4 glands and their functions )**

Endocrine system consist of glands widely separated from each other with no direct anatomical links. They are commonly referred as the ductless glands. Endocrine glands are groups of secretory cells surrounded by an extensive network of capillaries that facilitates diffusion of hormones (chemical messengers) from the secretory cells into the bloodstream. Homeostasis of the internal environment is maintained partly by the autonomic nervous system and partly by the endocrine system. Endocrine control is mainly involved in slower and more precise adjustments. Although the hypothalamus is classified as a part of the brain rather than an endocrine gland, it controls the pituitary gland and indirectly influences many others. The ovaries and the testes secrete hormones associated with the reproductive system after puberty. The endocrine glands are:

**1) Pituitary gland:**

**-Growth hormone:** This hormone promotes growth in childhood. For adults, it helps to maintain healthy muscle and bone mass.

**-Prolactin:** In women, it stimulates milk production. In males, low levels are linked to sexual problems; however, most males make no use of the hormone.

**-Adrenocorticotropic:** This hormone promotes the production of cortisol, which helps to reduce stress, maintain healthy blood pressure and more.

**-Thyroid-stimulating hormone:** Just as the name implies, this hormone helps to regulate the body's thyroid, which is crucial in maintaining a healthy metabolism.

**-Luteinizing hormone:** In women, this hormone regulates estrogen. In men, it regulates testosterone.

**-Follicle-stimulating hormone:** Found in both men and women. It stimulates the releasing of eggs in women and helps ensure the normal function of sperm production in men.

The back part of the pituitary gland is called the posterior pituitary. It produces the following two hormones:

**-Oxytocin:** This hormone causes pregnant women to start having contractions at the appropriate time and also promotes milk flow in nursing mothers.

**-Antidiuretic hormone:** Commonly referred to as vasopressin, this hormone helps to regulate water balance in the body.

**2) Thyroid gland:**

Found in both women and men, the thyroid controls a person's metabolism.

**3) Parathyroid glands:**

This gland is vital to proper bone development because it helps control both calcium and phosphorous levels in the body.

**4) Adrenal (suprarenal) gland:**

This gland helps to control blood sugar.

- Promoting proper cardiovascular function.
- Properly utilizing carbohydrates and fats.
- Helps distribute stored fat.
- Promotes healthy gastrointestinal functions.



### 5) Pancreatic islets:

The main function of the pancreas is to maintain healthy blood sugar levels.

### 6) Pineal gland or body:

The pineal gland releases melatonin, which helps the body recognize when it is time to go to sleep. Researchers continue to learn more about this gland

### 7) Thymus gland:

This gland secretes hormones that are commonly referred to as humeral factors and are important during puberty. The role of these hormones is to make sure a person develops a healthy immune system.

### 8)

Testes:

Found in men, this gland produces testosterone, which promotes the growth of the penis as a male gets older as well as facial and body hair. It also deepens the voice of a male at a certain age. Other functions of testosterone include:

- Maintaining sex drive
- Promoting production of sperm
- Maintaining healthy levels of muscle and bone mass

Ovaries:

found in women, this gland produces both estrogen and progesterone, which promote the development of breasts. They also help a woman maintain healthy menstrual periods.

### c) Describe the action of enzymes in the digestion of protein. (8 marks)

Ans An enzyme is a chemical substance which causes or speeds up a chemical change in other substances without itself being changed. They are organic catalysts. Each enzyme is specific to one chemical change and has an optimal pH and temperature for action.

Dietary protein consists of a number of amino acids. About 20 amino acids have been named and nine of these are described as essential because they cannot be synthesized in the body. The others are non-essential amino acids because they can be synthesized by many tissues. The enzymes involved in this process are called transaminases. Digestion breaks down dietary protein into its constituent amino acids in preparation for absorption into the blood capillaries of the villi in the small intestine. Amino acids are transported in the portal circulation to the liver and then into the general circulation, thus making them available to all body cells and tissues. Different cells choose from those available the particular amino acids required for building or repairing their specific type of tissue and for synthesizing their secretions, e.g. antibodies, enzymes or hormones.

Amino acids not required for building and repairing body tissues cannot be stored and are broken down in the liver.

In stomach, hydrochloric acid converts pepsinogen to pepsin. The *pepsin* then converts proteins to polypeptides. Enterokinase secreted by enterocytes in small intestine converts chymotrypsinogen and trypsinogen from pancreas to chymotrypsin and trypsin. Chymotrypsin and trypsin then transform polypeptides to dipeptides and tripeptides. Peptidase enzymes secreted in

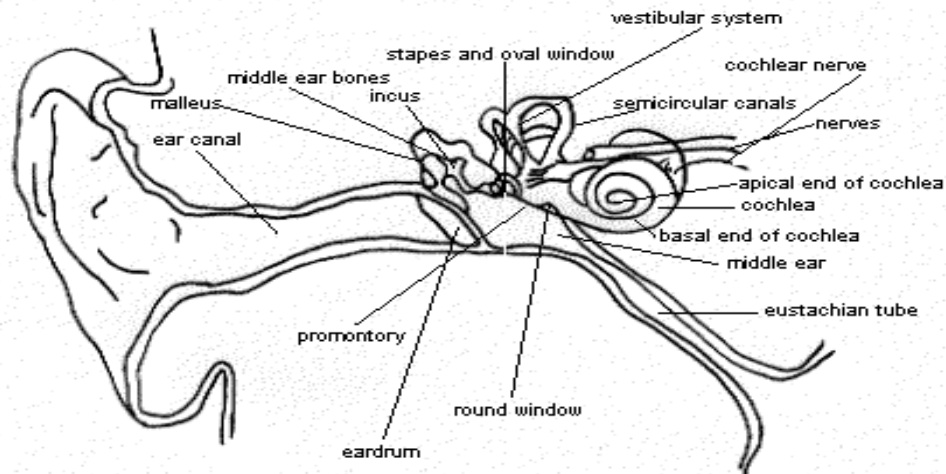
enterocytes then convert dipeptides and tripeptides to amino acids

**Q5 Solve any Two**

**16**

a) Describe mechanism of hearing(8Marks)

Ans:



Human ear is stimulated on producing sound waves at the rate of 30 and 30000/ seconds and sound waves travels at speed of 340 meter/ second. Sound waves are generally carried by air but also pass through solid and liquid. Sound waves are generally passes rapidly through solid.

Hearing process is completed by all parts of ear

- a) External ear – External acoustic meatus up to Tympanic membrane
- b) Middle ear – Ear ossicles – Incus, Malleus and Stapes
- c) Internal ear – Fenestra vestibule and Cochlea

Hearing process is conducted by collection of sound waves which leads to the vibration of tympanic membrane when waves pass through external acoustic meatus

Ear ossicles Incus, Malleus and Stapes carry the vibrations received by tympanic membrane to the internal ear

Through fenestra vestibule. Vibration of ear ossicle (Stapes) causes vibration in perilymph leads to vibrations of endolymph which stimulates nerve endings of vestibulocochlear nerve and this nerve carries stimulus at the centre of hearing located in temporal lobe of brain where it is appreciated or interpreted.

Appreciation brought stimulus through auditory nerve to the centre of hearing but identification depends on previous experience and power of reasoning.



b) Describe central nervous system. How does it differ from autonomic nervous system?

Ans – (4m+4m)

Brain is a chief important organ of central nervous system which is located in cranial cavity. According to the development it divides into three parts Forebrain, Mid brain, and Hind brain

### **FOREBRAIN**

It is larger part and called as cerebrum. It has two hemispheres right & left, separated from each other by longitudinal or median fissure. It separates completely in front and back but in middle is connected by band of nerve fiber called corpus callosum.

Cerebrum has outer layer called cerebral cortex which is composed of grey matter formed by numerous folds- Convulsions are called Gyri and Fissures are called Sulci. This pattern of gyri & sulci is same in all human beings.

Central sulcus- It runs downwards and forwards from top of hemisphere just above lateral sulcus.

Lateral sulcus- It runs backwards from lower part of brain

Parietooccipital sulcus- It runs downwards and forwards from upper posterior part of brain

### ***Lobes of brain***

Frontal lobe- Lying in front of central sulcus and above lateral sulcus.

Parietal lobe- Lying in between central sulcus and above lateral, parietooccipital sulcus.

Occipital lobe- It is in the back side of brain

Temporal lobe- It lies below lateral sulcus extends back to occipital lobe.

In sectional study of brain portion outside of the cerebrum is called cortex formed by grey matter which is composed of cell bodies. And inner side is called white matter composed of nerve fibers

### **MID BRAIN**

It lies between forebrain and hindbrain. It is measuring about 2cm in length and consists of mainly

- a) Cerebral Peduncles
- b) Quadrigeminal bodies
- c) Pineal Body

#### **a) Cerebral peduncles**

There are stalk like bands of white matter which help to pass impulses from spinal cord to brain and brain to the spinal cord

#### **b) Quadrigeminal bodies**

These are small four prominences mainly concerned with hearing and sight

#### **c) Pineal body**

These are small parts lying between two upper quadrigeminal bodies. These mainly take part in regulation of body temperature.



## HIND BRAIN

Hind brain consist of mainly three parts

- a) Pons
- b) Medulla oblongata
- c) Cerebellum

### **a) Pons**

It lies in between midbrain and medulla oblongata. It consists of nerve fibers which carry impulses to upward and downwards that is to the brain and its parts like cerebellum.

### **b) Medulla oblongata**

It lies between pons above and spinal cord below. It consists of vital centres like cardiac and respiratory, which controls activities of heart and lungs.

### **c) Cerebellum**

It lies posteroinferior side of brain below occipital lobe and connected to the midbrain, pons and medulla oblongata by nerve fibers called superior, middle, inferior cerebellar peduncles.

By CNS control over different parts of body is by spinal nerves through spinal cord which is voluntary in nature and ANS is controlled by cranial nerve fibers which are involuntary in nature

Autonomic nervous system is mainly concerned to the control the internal organs, function of these organs are not under willing control. Mostly organs of special senses, vital organs and secretory glands are provided by cranial nerve fibers.

c) How does kidney helps to maintain water balance of body(8)

Ans.– Urine consist of water, salts and protein waste products namely urea, uric acid and creatinine. The average composition of water is 96%, urea2%, uric acid and salts are 2%. The salts consist of chiefly sodium chloride, phosphates and sulphates produced partly from the use of phosphorus and sulphur from protein food.

The normal quantity of urine secreted is 1.5 liters in 24 hrs but it is increased by drinking and cold weather and reduced by less fluid intake, hot weather, exercise and by fever because of sweating. Potassium salts are reabsorbed or excreted as required to keep correct balance of level body fluid.

### Formation of Urine

Formation of urine takes place under three stages as follows

- i) Filtration under pressure*
- ii) Selective reabsorption*
- iii) Active secretion*

i)Filtration under pressure

It occurs at glomerular capsule where because of difference in size of vessels pressure exerted over efferent vessels leads to increased permeability of vessel wall and glomerular capsule. This fluid is called as glomerular filtrate and it has same composition of plasma in that it contains glucose, amino acids, fatty acids, salts, urea and uric acid in the same proportion. Normally 125 ml of glomerular filtrate is formed leads to 150 to 280 liters of urine is formed per day. The average amount of urine is passed per day is about is 1.5 litres so it is obvious that reabsorption must occurs.

ii) Selective reabsorption

Reabsorption of water, glucose, salts and their ions which required for body is takes place by proximal convoluted tubule because its cells are able to absorb. Mostly by absorption of water and salts resulted to passing of 1.5 litres of fluid to the tubules which consist of 2% of urea. It helps to maintain pH of about 7.4

iii) Active secretion

It occurs because the cell lining of tubule have ability to secrete some substance from the blood in second capillary network in to lumen of tubule

**Q 6 Solve (Any Two)**

16

a) Discuss anatomy of eye with sketch. (Description 4m+sketch 4m)

Ans.

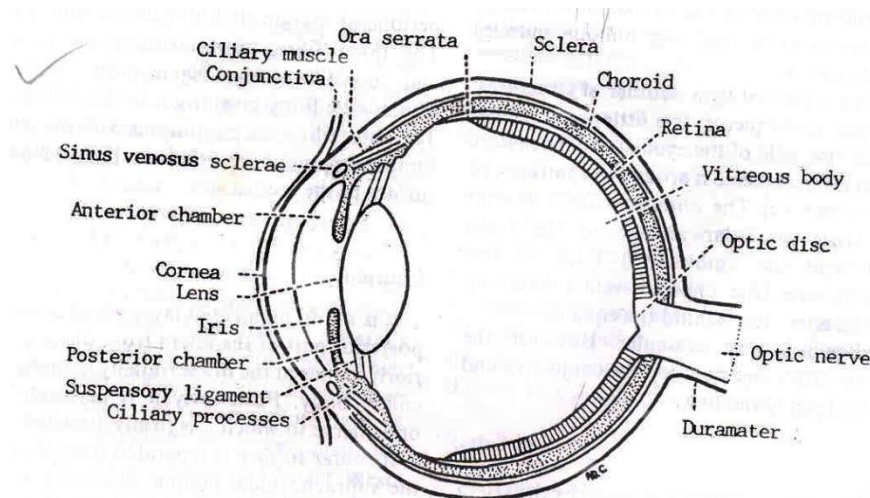


Fig. 19.1. Sagittal section through the eyeball.

Eye is the organ of vision or sight its function is to focus image on retina where retina is composed of nervous tissues which refers signals generated by light to the brain its vision centre.

Structure of Eye

Eyes are spherical organs lies within fat. It has three coats (layers)

- a) Outer fibrous coat
- b) Vascular pigmented coat
- c) Inner nervous coat
- A) Fibrous coat –**

It has two parts Sclera and Cornea



a) **Sclera** – It is a posterior part, firm membrane which maintains shape of eyeball. It is white in colour and forming white part of eye. Anteriorly covered with conjunctiva which is protective covering which reflect over inner side of eyelids.

b) **Cornea** – It is anterior fibrous coat projects little outside from spherical shape of eyeball. It is transparent covering which allows passing light rays inside eye by bending to focus on retina.

**B) Vascular , pigmented coat –**

It has three part Choroid, Ciliary body and Aqueous humour

a) **Choroid** – It lines front part of eyeball, dark brown in colour and provides blood to other part of eye particularly to the retina.

b) **Ciliary body** – It is a thickened part of middle coat consists of muscular and glandular tissues, ciliary muscles controls shape of lens. These are also known as muscles of accommodation. Ciliary glands produces watery fluid.

c) **Aqueous humour** – It lies in front of lens and passes veins through angle formed by Iris and Cornea.

Iris is coloured part eye lies between cornea and lens and divides space between anterior and posterior chambers. It contains muscular tissue arranged in circular and radiating fibres which helps to constrict pupils.

**C) Inner, nervous coat –**

Inner lining coat is called as retina. It is made by rods and cones. Rods are more numerous around outer edge of retina and sensitive to the movements of object within field of vision and cones are located in centre, they are responsible to vision and colour identification.

Rods consist of pigments called visual purple which synthesized by Vit-A, Deficiency of vit.- causes night blindness.

Optic nerve leaves the area of eye is called optic disc and area which is insensitive to the light is called blind area or blind spot.

**CONTENTS OF EYE**

Eyes consist of

- A) Aqueous humour
- B) Vitreous humour
- C) Lens

A) **Aqueous humour** - It is the front part of eye lies in front of lens which divides by iris in to anterior and posterior chamber. Which consist of muscular fibres by their contraction and relaxation they allow to enter light rays to focus on retina.

When light rays are more it will constrict to pass limited required rays to focus on retina and on less rays it dilates to allow rays to focus on retina.

B) **Vitreous humour** – It is colourless, transparent jelly substance which lies of posterior part of lens which maintains shape eyeball.

C) **Lens** – It is situated immediately behind iris. It is transparent biconcave body lies within capsule which adherent to the ciliary muscles and ciliary body called suspensory ligaments which helps to pull lens and maintains shape for near or far vision.





b) Describe cerebellum and its function (4marks+4marks)

Ans.

Cerebellum is largest part of hind brain situated in posterior cranial fossa behind pons and medulla. It coordinates voluntary movements of the body. It lies posteroinferior side of brain below occipital lobe and connected to the midbrain, pons and medulla oblongata by nerve fibers called superior, middle, inferior cerebellar peduncles. It is made up with two hemisphere which are connected together by stem called vermis

Functions

- 1) The cerebellum is concerned with the coordination of voluntary muscular movement, posture and balance.
- 2) Cerebellar activities are not under voluntary control.
- 3) The cerebellum controls and coordinates the movements of various groups of muscles ensuring smooth, even, precise actions.
- 4) It coordinates activities associated with the *maintenance of the balance and equilibrium* of the body.
- 5) The sensory input for these functions is derived from the muscles and joints, the eyes and the ears. *Proprioceptor impulses* from the muscles and joints indicate their position in relation to the body as a whole and those impulses from the eyes and the semicircular canals in the ears provide information about the position of the head in space.
- 6) Impulses from the cerebellum influence the contraction of skeletal muscle so that balance and posture are maintained.
- 7) Damage to the cerebellum results in clumsy uncoordinated muscular movement, staggering gait and inability to carry out smooth, steady, precise movements.

C) Give the location of pituitary gland and mention its function (4m+4m)

Answer – This gland lies in hypophyseal fossa of sphenoid bone at the base of skull in the brain. It is attached by neural stalk to the optic chiasma. Gland has Anterior and Posterior lobes. Anterior lobe also called as adenohypophysis. It is the actual endocrinal gland. Posterior lobe is called as neural lobe. It consists of nervous tissues which is derived from brain and directly connected to hypothalamus. Anterior lobe of pituitary is concerned as Master Gland because it has main and important influence in regulating the function of other gland

Function of Gland

- a) It secretes Thyroid stimulating hormone (TSH) and helps in calcium metabolism
- b) It secretes Adrenocorticotrophic hormone (ACTH) mainly regulates the development, maintenance and secretion of cortex of suprarenal gland. This hormone helps in mobilisation of fats, production of hypoglycaemia, also involved in body resistance in stress.
- c) It secretes Somatotrophic hormone (GH), increases rate of growth and maintains size
- d) It secretes Follicle stimulating hormone (FSH), It mainly controls maturation of ovarian follicles in females and production of sperm in males.
- e) It secretes Leuteinising hormone (LH) It works for development of corpus leuteum also helps to prepare breast for secretion of milk. In males this hormone acts on testis and controls secretion of testosterone hormone
- f) It secretes Prolactin This hormone works in females; it is involved in production of milk by breast
- g) It secretes Oxytocin, It mainly works on smooth muscle of uterus and duct of breast. It also works for generalised contraction of striated muscle of body
- h) It secretes Antidiuretic hormone (ADH) It helps to reabsorption of water by kidney tubules leads to less secretion of urine. Less secretion of ADH causes less water reabsorption leads to excess quantity amount of urine