



SUMMER– 15 EXAMINATION

Subject Code: 17436

Model Answer

Page No: 01/20

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.



SUMMER – 15 EXAMINATION

Subject Code: 17436

Model Answer

Page No: 02/20

Q.1.	Attempt any ten of the following	20
a)	Write two functions of pituitary gland.(01 mark for each function) Ans: 1)The anterior lobe of pituitary secretes hormones for eg. Growth hormone which is required for normal growth of the body. 2)The posterior lobe secretes two hormone for e.g. Oxytocin which is required while labour to contract the uterus.	02
b)	Write two functions of joints. .(01 mark for each function) Ans: 1)It allows movement in one direction only. 2) It allows rotational movement. For eg. Elbow. 3) It gives gliding movement. 4) Two pairs of articular surfaces allow movement in one direction only. For e.g. Knee.	02
c)	Write two functions of Skeletal muscles .(01 mark for each function) Ans: 1)They give shape, form and appearance to the body. 2) They protects the vital organ of the body. 3)They keep the joints in proper position 4)They produce movements of the body. 5)They help in venous return and lymphatic drainage	02
d)	Write normal value of heart rate and pulse rate in adult .(01 mark for each) Ans: Heart rate: 72 beats/min Pulse rate: 60 to 100 beats /min.	02
e)	What is resting membrane potential? Ans: The difference in potential across the membrane of a cell when it is at rest, i.e., fully repolarized.	02
f)	What is cardiac output? Ans: It is defined as the quantity of blood pumped by the heart in one minute. Cardiac output=Stroke	02



	volume x Heart rate.	
g)	Write normal value of blood pressure in adults.(01 mark for each) Ans: 1) Systolic blood pressure: 100 to 120 mm Hg 2) Diastolic blood pressure: 60 to 80 mm Hg.	02
h)	Give two functions of skin.(01 mark for each function) Ans: 1) Protection of underlying structures from injury. 2) Excretion of salts like sodium chloride and metabolites like urea. 3) Provides sensation which gives the awareness of environment. 4) Secretion of sweat and sebum. 5) Regulation of body temperature. 6) Synthesis of vitamin D from ergosterol of skin by the action of UV rays of sun	02
i)	Write list of instruments used to detect abnormal functioning of heart. (01 mark for each instrument any two instruments) Ans : 1) Sphygmomanometer 2) ECG machine 3) Heart rate meter.	02
j)	What is lung volume? Ans: Lung volume is the percentage of air that the lungs can hold at any given time.	02
k)	Write list of instruments related to respiration. (01 mark for each instrument any two) Ans: 1) Spirometer. 2) Ventilator 3) Respiration rate meter.	02
l)	What is lung capacity. Ans: The volume of gas in the lungs at the end of a maximum inspiration. It equals the vital capacity plus the residual capacity.	02



m)	<p>Name organs which are involved in digestive system. . (1/4 mark for each)</p> <p>Ans: 1) Mouth. 2) Pharynx. 3) Oesophagus. 4) Stomach. 5) Small intestine. 6) Large intestine. 7) Rectum. 8) Anus.</p>	02
n)	<p>Write any two functions of kidney.(01 mark for each function)</p> <p>Ans: 1) To secrete and excrete urine. 2) Excretion of excess Sault. 3) Excretion of harmful substances drugs and toxins. 4) Regulation of PH of blood.</p>	02
2.	Attempt any Two of the following	16
a)	<p>Enlist different types of tissues and mention two functions of each.(List 04Mark, Functions <u>any two</u> of each 04 Mark)</p> <p>Ans:</p> <p>1) Epithelial tissue.</p> <ul style="list-style-type: none">• Function It forms covering to the free surfaces of body.• It performs vital functions like protection,, excretion,giandular secretion and absorption. <p>2) Connective tissue:</p> <ul style="list-style-type: none">• Function : Connective tissues serve to connect or bind together different organs or different parts of an organ.• It helps in binding and supporting the cells. <p>3) Muscular tissue:</p> <ul style="list-style-type: none">• Function: It helps to contraction of muscle• It helps to produce movement. <p>4) Nervous tissue:</p>	08



	<ul style="list-style-type: none">• Function: It carries out special function of carrying messages of stimuli within the body.• It covers and protects the axon of some nerves.	
b)	<p>Write composition and function of blood(mention six functions).(Composition 02 Mark, Function 06Mark)</p> <p>Ans: Composition of blood: Blood contains a fluid called plasma in which the cellular elements of blood are suspended.</p> <p>Plasma contains 1) water to the extent of 91% 2) proteins(albumin, glucose and fibrinogen.3)Other substances like glucose, sodium, chloride, iron ,urea ,uric acid and cholesterol.</p> <p>Function of blood:1)It transports oxygen and nutrients to various tissues, 2) It transports waste products to organs of excretion. 3) It carries hormones from endocrine glands to various tissues. 4) It redistributes water from one part of body to the other. 5) It contains antibodies and white blood cells which protects the body from diseases. 6) Clotting of blood protects against heamorrhage.</p>	08
c)	<p>Describe cardiac muscle and its Properties. (Description 04 Marks, 04 m for Properties)</p> <p>Ans: Cardiac muscles found only in heart, it is strained like voluntary muscle, but it differs in that it's fibers branches and anastomose with each other. They are arranged longitudinally as in strained muscle and characteristically red in color and involuntary in nature.</p> <p>Properties: 1) contractility: by contraction of the cardiac muscle the heart pumps the blood out of its chamber. 2) Conductivity: The impulses for cardiac contraction are conveyed through specialized conduction system. 3) Rhythmsity: The heart muscle has the inherent property of rhythmic contraction. Cardiac contraction occurs in a regular faction. The two atria and ventricles contracts alternately. 4) Refractory Period: during systole the heart does not respond to any other stimuli, however strong it may be. This is called as refractory period.</p>	08
Q3	Attempt any four of the following.	16
a)	<p>Write classification of bone and give two function of each. (2m+2m)</p> <p>Ans: Classification of bone:</p> <p>1. Long bone:</p> <p>Function: 1. Long bones contain yellow bone marrow and red bone marrow, which produce blood cells.</p> <p>2. Long bones are hard, dense bones that provide strength, structure, and mobility</p>	04



2. Short bone.

Function:

1. Their primary function is to provide support.
2. Stability with little to no movement.

3. Flat bone.

Function

1. Flat bones are bones whose principle function is either extensive protection.
2. The provision of broad surfaces for muscular attachment.

4. Irregular bone.

Function

1. Irregular bones serve various purposes in the body, such as protection of nervous tissue (such as the vertebrae protect the spinal cord).
2. Affording multiple anchor points for skeletal muscle attachment (as with the sacrum).
3. Maintaining pharynx and trachea support.

5. Sesamoid Bones.

Function:

1. To resist pressure.
2. To minimize friction.
3. To alter the direction of pull of the muscle.
4. To maintain the local circulation

b)

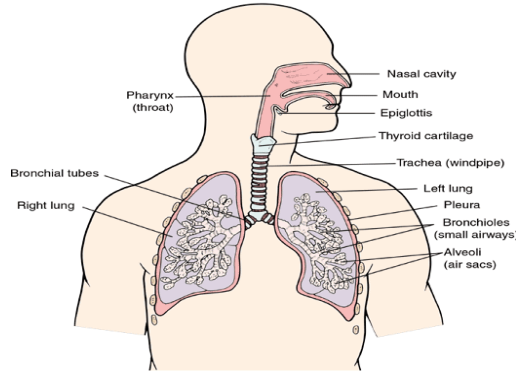
Write anatomy of respiratory system with neat labeled diagram.

(Diagram 02 Mark, Description 02 Mark)

Ans:

04

Respiratory System



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The respiratory system is situated in the thorax, and is responsible for gaseous exchange between the circulatory system and the outside world. Air is taken in the upper airways that is the nasal cavity, pharynx and larynx through the lower airways trachea i.e. trachea, primary bronchi and bronchial tree and into the small bronchioles and alveoli within the lung tissue. The lungs are divided into lobes; The left lung is composed of the upper lobe, the lower lobe and the lingual, the right lung is composed of the upper, the middle and the lower lobe.

c)

Give the structure and function of cell organelles.

(Structure 02 Mark, Function 02 Mark)

Ans:

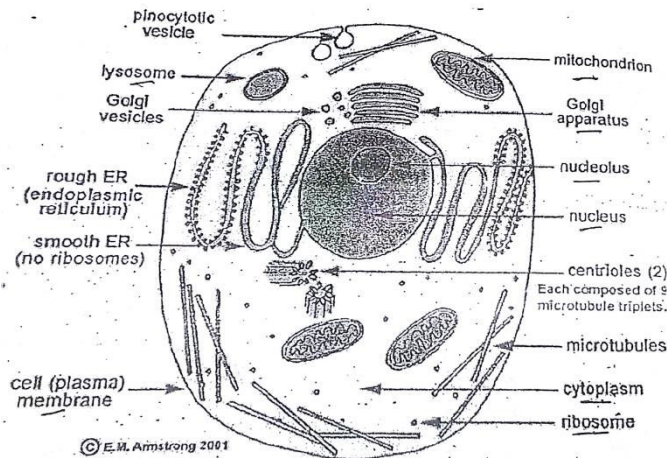


Fig: Components of the cell

Living things are made of cells. Some organisms consist of just one cell, while others are made of trillions of cells. Each one of these cells functions as a tiny factory, with individual parts that work together to keep the cell alive and, in turn, keep the organism going. These parts are called organelles.

- Cell membrane: Separates the cell from outside environment, Selectively permeable
- Cell wall : Additional support, protection , Gives cell its shape
- Nucleus: Controls cell activities
- Nuclear membrane/ Envelope: Allows material to move into & out of Nucleus (RNA pass through pores)
- Nucleolus: Assembly of ribosome's take place here
- Cytoplasm: Chemical reactions take place here
- Ribosome: Site of protein synthesis.
- Golgi Apparatus: Sorts & packs protein into vesicle & transports them.

04

- Lysosome: Digests food, bacteria, worn out organelle

d) **Describe the anatomy of heart with a neat labeled diagram.** **04**

(Diagram 02 Mark, Description 02 Mark)

Ans:

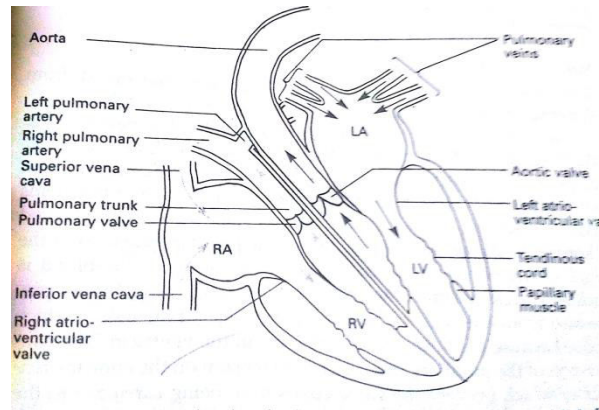


Fig: The Heart

The human heart is a four-chambered muscular organ, shaped and sized roughly like a man's closed fist with two-thirds of the mass to the left of midline.

The heart is enclosed in a pericardial sac that is lined with the parietal layers of a serous membrane. The visceral layer of the serous membrane forms the epicardium.

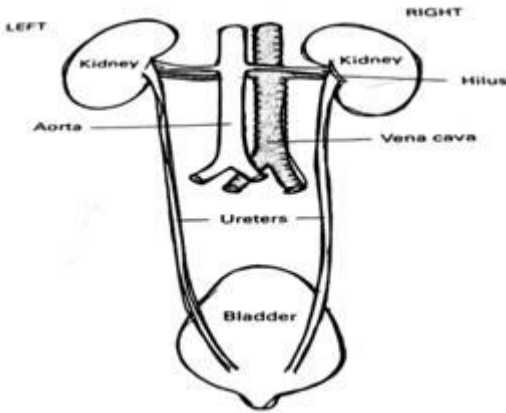
Three layers of tissue form the heart wall. The outer layer of the heart wall is the epicardium, the middle layer is the myocardium, and the inner layer is the endocardium. The internal cavity of the heart is divided into four chambers:

- Right atrium
- Right ventricle
- Left atrium
- Left ventricle

The two atria are thin-walled chambers that receive blood from the veins. The two ventricles are thick-walled chambers that forcefully pump blood out of the heart. Differences in thickness of the heart chamber walls are due to variations in the amount of myocardium present, which reflects the amount of force each chamber is required to generate. The right atrium receives deoxygenated blood from systemic veins; the left atrium receives oxygenated blood from the pulmonary veins.

e) **Describe the mechanism of gaseous exchange in the lungs.** **04**

Ans: Exchange of gases takes place at alveoli because of pressure of oxygen is more in inspiratory air, exchange of gases & diffusion process according to pressure law. Oxygen present in inspired air diffused and equalizes it with quantity present in deoxygenated blood, in the same way diffusion of

	carbon dioxide takes place more quantity diffused along with lower quantity of Co ₂ in inspired air.	
f)	<p>Describe the conduction system of the heart.</p> <p>Ans: - The cardiac conduction system is group of specialized cardiac muscle cell in the walls of the heart that send signals to the heart muscle causing it to contract. The main components of the cardiac system are the SA node, AV node, bundle of His, bundle branches and purkinje fibers. The SA node starts the sequence by causing the arterial muscle to contracts. From there signal travels to the AV node, through bundle of His, down the bundle branches, and through the purkinje fibers, causing the ventricles to contracts. This signal creates an electrical current that can be seen on graph called an Electrocardiograph.</p>	04
Q 4.	Attempt any Two of the following.	16
a)	<p>Describe the anatomy of urinary system with a neat labeled diagram.</p> <p>Ans: (Diagram 04 Mark, Description 04 Mark)</p> <div style="text-align: center;">  </div> <p style="text-align: center;">Fig: The urinary System</p> <p>The urinary system, also known as the renal system, consists of the two kidneys, ureters, the bladder, and the urethra. Each kidney consists of millions of functional units called nephrons. The purpose of the renal system is to eliminate wastes from the body, regulate blood volume and pressure, control levels of electrolytes and metabolites, and regulate blood pH. The kidneys have extensive blood supply via the renal arteries which leave the kidneys via the renal vein. Following filtration of blood and further processing, wastes (in the form of urine) exit the kidney via the ureters, tubes made of smooth muscle fibers that propel urine towards the urinary bladder, where it is stored and subsequently expelled from the body by urination(voiding). The female and male urinary system are very similar, differing only in the length of the urethra.</p> <p>Urine is formed in the kidneys through a filtration of blood. The urine is then passed through the ureters to the bladder, where it is stored. During urination (peeing) the urine is passed from the bladder through the urethra to the outside of the body.</p> <p>About 1-2 litres of urine are produced every day in a healthy human, although this amount may vary according to circumstances such as fluid intake.</p> <p>The urinary system refers to structures which conduct urine, formed in the nephrons of the kidney, to the point of its excretion. There are two kidneys in the human body, on the right and the left. Urine begins to be created within a nephron, which is a small unit within the kidney. It travels through the structures of</p>	08



	<p>the nephron and into the collecting duct system, which is a system of larger vessels within the kidney. The collecting ducts join together to form calyces and ultimately major calyces, larger and larger ducts. These drains into a structure called the pelvis of the kidney, and enter the ureter. The ureter is a tube-like structure which carries the urine from the kidneys to the bladder. The ureters enter the bladder from within the bladder.</p> <p>Urine collected in the bladder is discharged through the urethra, which ends at the external urethral orifice.</p>	
b)	<p>Describe the mechanism of formation of urine.</p> <p>Ans: - Formation of urine takes place under three stages as follows.</p> <p>i) Filtration under pressure: It occurs at glomerular capsule where because of difference in size of vessels pressure exerted over efferent vessels lead 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 acid, fatty acid, salt, 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 1.5 liters so it is that reabsorption must occurs.</p> <p>ii) Selective reabsorption: Reabsorption of water, salt and their iron 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</p> <p>iii) Active secretion: Non-threshold substances which are not filtered via by capsule are carried in the capillaries of efferent arteriole & are cleared by secretion into the tubule.</p>	08
c)	<p>Describe the anatomy of female reproductive organs with a neat labeled diagram.</p> <p>(Diagram 04 Mark, Description 04 Mark)</p> <p>Ans:</p> <p>Female reproductive system consist of internal and external genital organs</p> <p>a)Internal Organs:1) ovaries 2) uterine tube 3)vagina.</p> <p>b) External organs:1)mons pubis 2)labia majora and minora 3)clitoris4) vestibule of vagina 5)Greater vestibular gland.</p> <p>Females are born with a large number of potential ova (female sex cells, also called egg cells). However, it isn't until after the onset of puberty, typically around age 12, that these cells are mature enough to sustain life. The cells ripen on a regular basis, but only one is released each month until a woman reaches menopause. Menopause commonly begins between the ages of 45 and 55.</p> <p>The major organs of the female reproductive system include:</p> <p>Vagina: This muscular tube receives the penis during intercourse and through it a baby leaves the uterus during childbirth.</p> <p>Uterus: This organ holds and nourishes a developing fetus, if an egg was properly fertilized.</p> <p>Ovaries: The female gonads, the ovaries produce ova. When one matures, it is released down into a</p>	08

fallopian tube.

Fallopian tubes: These small tubes transport ova from the ovaries to the uterus. This is where an egg waits to be fertilized.

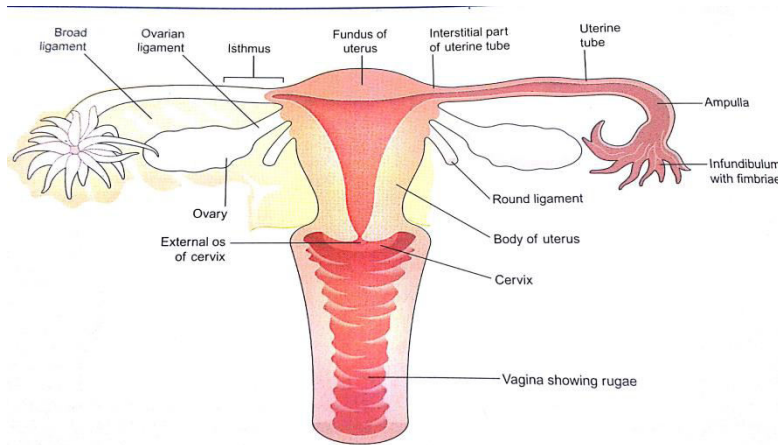


Fig :Female Reproductive system

5)	Attempt any four of the following.	16
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a)	<p>Name the parts involved in respiratory system with one function of each.</p> <p style="text-align: center;">(Parts- 2 marks, and Function - 2 marks)</p> <p>Organs of respiratory system consist of</p> <ol style="list-style-type: none"> a) Nose b) Pharynx c) Larynx d) Trachea e) Lungs <p>Nose Functions- It conducts respiration process mainly filtration of air, Temperature maintenance of inspired air(heating and cooling).</p> <p>Pharynx It is a small part of digestive system but its anterior wall is incomplete and communicate with nasal tract a divides in to three parts</p> <ol style="list-style-type: none"> i) Nasopharynx –Which lies behind nose above the level of soft palate ii) Oropharynx – Lies behind mouth below level of soft palate iii) Laryngiopharynx – Lies behind larynx <p>Function – It controls passing of air and food.</p> <p>Larynx Function – It consist of vocal cord which helps for production of voice.</p> <p>Trachea It is a muscular tube measuring about 12 cm long. It starts from lower border of cricoid cartilage continuous from larynx and terminates at the level of T5 vertebrae after bifurcation. It is attached by ‘C’ shaped cartilaginous rings which are incomplete on posterior side but attached their ends by loose connective tissue which also helps to expand size of oesophagus during swallowing and deglutination of f</p>	04
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Any foreign particles or dust more inhaled in right lung easily so because of that right lung are commonly infected than left lung

Lungs

These are principal organ of respiratory system present in pair. Lungs are spongy in texture weighing about 625 gm of right & 575 gm of left lung. Right lung is heavier than left lung. Right lung has two fissures, three lobes, & ten segments. & left lung has one fissure, two lobes, & eight segments.

Lungs are vital organ they are protected by covering, known as Pleura .Pleura has two layers

- i) Pulmonary pleura
- ii) Parietal pleura

Function- It performs respiration process and exchange of gases

b)

Describe structure of skin.

04

(Description – 02 Marks, Figure - 02 mark)

Ans: The skin has three layers:

- Epidermis
- Dermis
- Fat layer (also called the subcutaneous layer)

The skin has three layers. Beneath the surface of the skin are nerves, nerve endings, glands, hair follicles, vessels.

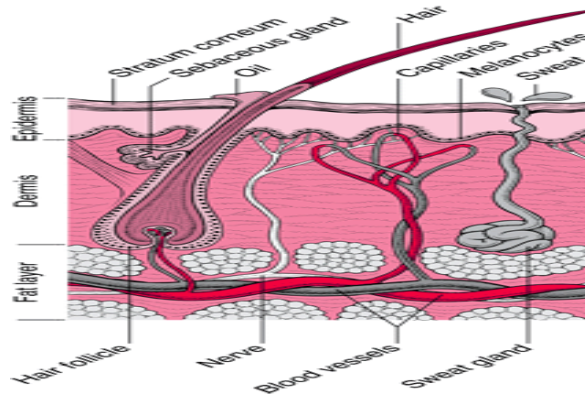


Fig: The Skin

Epidermis

The epidermis is the relatively thin, tough, outer layer of the skin. Most of the cells in the epidermis are keratinocytes. They originate from cells in the deepest layer of the epidermis called the basal layer. New keratinocytes slowly migrate up toward the surface of the epidermis. Once the keratinocytes reach the skin surface, they are gradually shed and are replaced by newer cells pushed up from below.

The outermost portion of the epidermis, known as the stratum corneum, is relatively waterproof and, when undamaged, prevents most bacteria, viruses, and other foreign substances from entering the body. The epidermis (along with other layers of the skin) also protects the internal organs, muscles, nerves, and blood vessels against trauma. In certain areas of the body that require greater protection (such as the palms of the hands and the soles of the feet), the outer keratin layer of the epidermis (stratum corneum) is much thicker.

Scattered throughout the basal layer of the epidermis are cells called melanocytes, which produce the



pigment melanin, one of the main contributors to skin color. Melanin's primary function, however, is to filter out ultraviolet radiation from sunlight, which damages DNA, resulting in numerous harmful effects, including skin cancer.

The epidermis also contains Langerhans cells, which are part of the skin's immune system. Although these cells help detect foreign substances and defend the body against infection, they also play a role in the development of skin allergies.

Dermis

The dermis, the skin's next layer, is a thick layer of fibrous and elastic tissue (made mostly of collagen, elastin, and fibrillin) that gives the skin its flexibility and strength. The dermis contains nerve endings, sweat glands and oil (sebaceous) glands, hair follicles, and blood vessels.

The **nerve endings** sense pain, touch, pressure, and temperature. Some areas of the skin contain more nerve endings than others. For example, the fingertips and toes contain many nerves and are extremely sensitive to touch.

The **sweat glands** produce sweat in response to heat and stress. Sweat is composed of water, salt, and other chemicals. As sweat evaporates off the skin, it helps cool the body. Specialized sweat glands in the armpits and the genital region (apocrine sweat glands) secrete a thick, oily sweat that produces a characteristic body odor when the sweat is digested by the skin bacteria in those areas.

The **sebaceous glands** secrete sebum into hair follicles. Sebum is oil, that keeps the skin moist and soft and acts as a barrier against foreign substances.

The **hair follicles** produce the various types of hair found throughout the body. Hair not only contributes to a person's appearance but has a number of important physical roles, including regulating body temperature, providing protection from injury, and enhancing sensation. A portion of the follicle also contains stem cells capable of regrowing damaged epidermis.

The **blood vessels of the dermis** provide nutrients to the skin and help regulate body temperature. Heat makes the blood vessels enlarge (dilate), allowing large amounts of blood to circulate near the skin surface, where the heat can be released. Cold makes the blood vessels narrow (constrict), retaining the body's heat.

Over different parts of the body, the number of nerve endings, sweat glands and sebaceous glands, hair follicles, and blood vessels varies. The top of the head, for example, has many hair follicles, whereas the soles of the feet have none.

Fat Layer

Below the dermis lies a layer of fat that helps insulate the body from heat and cold, provides protective padding, and serves as an energy storage area. The fat is contained in living cells, called fat cells, held together by fibrous tissue. The fat layer varies in thickness, from a fraction of an inch on the eyelids to several inches on the abdomen and buttocks in some people.

c)	<p>Mention juices secreted by digestive organs and their functions.</p> <p>(Juices secreted by Digestive organs – 2 marks, Functions- 2 marks)</p> <p><i>Salivary Glands</i></p> <p>The main salivary glands are found in the cheeks, under the tongue and around the jaw. They secrete</p>	04
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about 1 quart of saliva each day. Amylase, also called ptyalin, is an enzyme in saliva that breaks down carbohydrates. Carbohydrates are found in foods like bread and rice. Lysozyme is another salivary enzyme, which helps to keep the mouth free from germs. Saliva also contains mucus, which coats the food and enables each bite to travel smoothly through the digestive tract.

Role of the Stomach

The stomach, an important organ for digestion, is distinctive for its ability to produce hydrochloric acid. This acid is so powerful that the stomach must produce large amounts of mucus to protect itself from the acid. Hydrochloric acid works with an enzyme called pepsin to aid the digestion of protein-rich foods like eggs, meat and tofu. The production of acid is increased by a hormone known as gastrin, which is made by specific cells lining the stomach. The stomach is also responsible for the secretion of a substance called intrinsic factor, which helps the small intestine absorb vitamin B12.

Pancreas and Fat Digestion

The pancreas is a leaf-shaped organ that lies below the stomach. It secretes juices containing enzymes that are capable of digesting all major types of food -- carbohydrates, fats and proteins. The pancreas is the first organ to begin digesting fats. It secretes pancreatic lipase, esterase and phospholipase, which break down chemically complex fats into simple, easy-to-absorb fats. Similarly, trypsin and carboxypolypeptidase break down proteins, and pancreatic amylase breaks down carbohydrates. Pancreatic juice also contains large amounts of bicarbonate, which neutralizes the acid from the stomach.

Liver and Gall Bladder

The liver produces a greenish juice called bile, which is stored and concentrated by the gall bladder. After a high-fat meal, such as one containing cheese, cream or bacon, the fats from the food tend to stick together to form large fat spheres. These are too big to be absorbed by the body. Bile acts like soap, breaking the bonds that hold the spheres together and turning them into tiny globules that are easily taken up by the body.

Small Intestine

The small intestine is covered with tiny fingerlike extensions from its walls, called villi. The villi are where the nutrients from food are absorbed into the body. The tips of villi have many enzymes, such as peptidases, disaccharidases and intestinal lipases. They perform the final steps of digestion for all major food types, dissolving them into their basic building blocks to enable absorption. The deep spaces between the villi are called crypts, which secrete mucus, bicarbonate and water. In addition to these secretions, the cells of the small intestine also produce hormones, like secretin and cholecystokinin, which stimulate the other organs to release their digestive juices.

OR

1.Gatric juice 2.Intestinal Juice3.Pancreatic juice 4.Bile juice with functions

(Any other relevant answer should be considered)

d)

Enlist hormones secreted by male reproductive organs with functions of each.

(Hormones- 2 marks, Functions- 2 marks)

Ans :The male reproductive system depends upon the action of many different hormones or chemicals, produced by various body glands and enter systemic circulation. Some of these hormones, called "tropic" hormones, cause other hormones to release. Other hormones have direct effects upon organs or body systems, emotions and production of semen. Unlike women, men don't experience cyclic hormone fluctuation throughout the month--instead, their hormone levels stay relatively constant throughout their reproductive years.

Gonadotropin-Releasing Hormone

Something of a "master" hormone, Gonadotropin-Releasing Hormone (GnRH) is a tropic hormone produced by a part of the brain called the hypothalamus. While GnRH isn't directly responsible for male sexual behavior or characteristics, it nevertheless proves incredibly important, because it causes the release of two other hormones of the male reproductive system.

04

Follicle-Stimulating Hormone

Produced in a part of the brain called the anterior pituitary, follicle-stimulating hormone (FSH) proves active in both male and female reproductive systems. The name comes from the hormone's action in females---males don't produce follicles---but the same hormone responsible for development of a mature egg in women stimulates the production of sperm in the testes of men. FSH is released in response to the stimulation of the anterior pituitary by GnRH.

Luteinizing Hormone

Like FSH, luteinizing hormone (LH) is released by the anterior pituitary in response to the action of GnRH. Also like FSH, LH is produced by women as well and named for its action in the female reproductive cycle. In men, LH causes the interstitial cells of the testes to produce the hormone testosterone.

Testosterone

Made in the testes, testosterone enters systemic circulation in relatively constant concentrations in a healthy, reproductive-age male. This hormone produces and maintains the secondary sexual characteristics of the male---enhanced musculature, facial and body hair, thickened larynx and deepened voice and enlargement of the genitals. It's also responsible for the sex drive and works with FSH to stimulate the production of sperm.

Inhibin

The hormone inhibin is produced by cells in the testes that are responsible for monitoring the health and maturation of sperm. If sperm levels are high, making nutrients for the developing sperm scarce, the testes release inhibin. The inhibin travels through the bloodstream to the brain, where it prevents the secretion of GnRH. In the absence of GnRH, FSH and LH levels fall and sperm production slows. This is one of the major mechanisms whereby male hormones are maintained at relatively constant concentration.

e) **Give anatomy of eye and its functions (any two)**

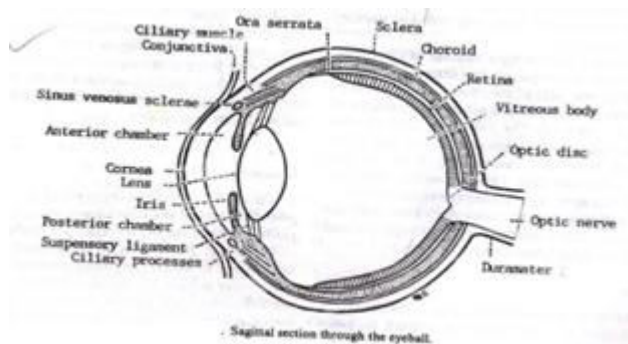
04

(Description – 2 marks, Fig-2 marks)

Ans: 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.

Functions-

- a) Formation of image
- b) Identification of colours
- c) Displacement of eyeball to form image



f)	<p>Describe structure of pituitary gland.</p> <p>Ans: 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.</p> <p>HORMONES SECRETED BY PITUITARY GLAND</p> <p>A] ANTERIOR LOBE</p> <ul style="list-style-type: none">a) Thyroid stimulating hormone (TSH)b) Adrenocorticotrophic hormone (ACTH)c) Somatotrophic hormone (GH)d) Follicle stimulating hormone (FSH)e) Leuteinising hormone (LH)f) Prolactin <p>B] POSTERIOR LOBE</p> <ul style="list-style-type: none">a) Oxytocinb) Antidiuretic hormone (ADH) <p>A] ANTERIOR LOBE</p> <p>a) Thyroid stimulating hormone- This is also known as thyrotrophic hormone. This mainly works to perform function of thyroid gland by stimulating accumulation of iodine in the gland for conversion into thyroid hormone. By action of this hormone thyroid starts to secrete its T₃ & T₄ hormones. TSH is involved in regulation of metabolic rate and breakdown of fat and increase water content of these tissues.</p> <p>b) Adrenocorticotrophic hormone- It 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.</p> <p>c) Somatotrophic hormone – Main action of this hormone is on hard tissues also acts on soft tissues. This hormone increases rate of growth and maintains size. Over secretion of this hormone causes growth of long bones in children called “Gigantism” and in adults “Acromegaly”. Under secretion or less secretion of this hormone causes thickening of bone. Lower jaw, hands and feet’s are particularly affected this condition is called “Dwarfism”.</p> <p>d) Follicular stimulating hormone – It mainly works for glands and their function. It mainly controls maturation of ovarian follicles in females and production of sperm in males.</p> <p>e) Leuteinising hormone – 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.</p> <p>f) Prolactin – This hormone works in females; it is involved in production of milk by breast.</p> <p>B] POSTERIOR LOBE Posterior lobe of pituitary releases only hormones they are actually produced by hypothalamus and storage as well as secretion controlled by posterior lobe.</p>	04



	<p>a) Oxytocin – It mainly works on smooth muscle of uterus and duct of breast. It also works for generalized contraction of striated muscle of body.</p> <p>b) Antidiuretic hormone – 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.</p>	
Q. 6)	Attempt any two of the following.	16
a)	<p>Write the function of cerebrum and cerebellum (Four functions each)</p> <p>Each function 1 mark</p> <p>Ans: Functions of cerebrum</p> <p>Frontal Lobe Emotions, planning, creativity, judgment, movement and problem solving are controlled in the frontal lobe.</p> <p>Parietal Lobe The senses of temperature, taste, pressure, touch and pain are controlled in the parietal lobes. Some language functions may also be controlled in the parietal lobe.</p> <p>Temporal Lobe Most hearing and language functions are controlled in the temporal lobes. Emotion, learning and auditory processes are also located in the temporal lobes.</p> <p>Occipital Lobe Vision and the ability to recognize objects are controlled in the occipital lobe. The retina of the eye sends input to the occipital lobe of the brain which then interprets the signals as images.</p> <p>Functions of cerebellum</p> <ul style="list-style-type: none">a) Control of Muscle toneb) Control of Posture and Equilibriumc) Control of Voluntary movementsd) Controls reflex actione) Controls sensory and motor reflex	08
b)	<p>Describe in brief the structure of neuron.</p> <p>This is a basic unit of nervous system. It has large cell body and size is varying according to the position and function. Each cell has clearly defined nucleus and protoplasm. The cell has several process called dendrites and axons. Dendrites are short branches through which impulses are enters to the cell. Axons are cylindrical single part or fibre through which impulses are passes out of cell. Axons are measuring about few millimetres to meters centimetres and continuous to the termination of cell.</p>	08

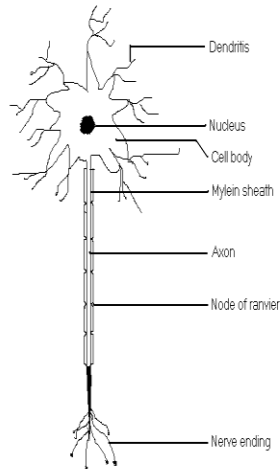


Fig:Parts of Neuron

Neuron has many processes arising from cell body such neurons are called multiple neurone. In another type one process is arises from cell body divide in to branches axons and dendrites these neurones are known as unipolar neurons.

Axons and some dendrites are covered by thin and fatty sheath composed of myelin sheath, which is covered by connective tissue called neurolemma. This myelin sheath has some constriction known as Node of Ranvier allows exchanging nutrients and waste material. This myelin sheath also protects or inhibits to pass impulses to other neurons and gives protection against compression and injury. These fibres are called myelinated fibres.

Non myelinated fibres composed mainly autonomic nervous fibres in certain parts of brain and spinal cord.

c)

Distinguish between CNS & ANS

(Write 8 differences)

08

Each difference 1 mark

Ans: CNS

- Central Nervous System (CNS) is made up of the brain, spinal cord and peripheral nerves (the nerves that run to the various parts of your body).
- It relays electrical signals to all of the organs throughout the body necessary for survival.
- sensory nerves that gather information from tongue ie Taste.
- Sensory nerves performs hearing mechanism
- Sensory nerves conduct vision
- Sensory nerves receives impulses from skin ie touch send the information to your central nervous system (CNS), to your brain
- Sensory nerves passes smell impulses from nose
- Besides those sensory nerves, you have **motor nerves** that transfer nerve impulses from your **CNS** to the organs of the body (muscles, glands, etc.).

ANS

- Autonomous nervous system (ANS) regulates basic vital functions



- | | |
|---|--|
| <ul style="list-style-type: none">• ANS is composed of both your parasympathetic (rest and relax) system and your sympathetic (flight or fight) system.• It regulates the homeostasis of your entire body without much conscious effort.• It's "automatic" – hence the name.• Respiration particularly gaseous exchange conducts• Cardiac activity controlled by ANS• Bowel movements conducted by ANS• Action or movements happen typically without too much thought on your part by ANS | |
|---|--|