



SUMMER– 2018 EXAMINATION

Model Answer

Subject Code:

17436

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.

Q. No.	Sub Q.N.	Answer	Marking Scheme
Q1		Attempt Any <u>TEN</u> :	20
	a)	Types of tissues. Ans: 1) Epithelial tissue. 2) Connective tissue 3) Muscular tissue 4) Nervous tissue	1 mark each
	b)	Define Artery & Vein. Ans: Artery : These are the blood vessels that transport blood away from the heart. Vein : These are the blood vessels that return blood at low pressure to the heart.	1 mark each
	c)	Name the organs structure included in respiratory system. Ans: 1. Nasal cavity 2. Pharynx 3. Layrnx 4. Trachea 5. Bronchi 6. Bronchioles 7. Alvoli	2



	<p>d) Function of Liver. Ans: (Any 2)</p> <ul style="list-style-type: none">- Production of bile, which helps carry away waste and break down fats in the small intestine during Digestion.- The liver is responsible for the breakdown of insulin and other hormones.- Production of certain proteins for blood plasma- Metabolizing carbohydrates- Production of cholesterol and special proteins to help carry fats through the body- Production of albumin which transports fatty acids and steroid hormones to help maintain the correct pressure and prevent the leaking of blood vessels.- Processing of hemoglobin for use of its iron content.- Conversion of harmful ammonia to urea (urea is one of the end products of protein metabolism that is excreted in the urine)- Clearing the blood of drugs and other harmful substances.- Regulating blood clotting.- Resisting infections by producing immune factors like Kupffer cells and removing bacteria from the bloodstream.- Clearance of bilirubin- The liver stores glucose (in the form of glycogen) , vitamin A , vitamin D, vitamin B12, vitamin K, iron, and copper.- Maintains body temperature.	<p>1 mark each</p>
	<p>e) Function of hormones. (any two) Ans: The secretions of the endocrine glands are named as hormones. Hormones are the chemical substances which are formed in endocrine gland and carried by blood to other distant organ or tissue, thereby controlling their activity. Chemically, hormones are peptides, steroids, amines, or derivatives of amino acids. It assures that growth occurs properly. It ensures that development and maturation occur properly and on time. It also making sure that reproduction occurs at the best possible time. Ultimately, hormones control the function of entire organs, affecting such diverse processes as growth and development, reproduction, and sexual characteristics. Hormones also influence the way the body uses and stores energy and control the volume of fluid and the levels of salts and sugar (glucose) in the blood.</p>	<p>2</p>
	<p>f) Name Biomedical instrument for ear Ans:</p> <ul style="list-style-type: none">- Audiometers.- Otoscope- Curette- Irrigator- Ear wash system- MRI- CT	<p>1 mark each</p>



	<p>g) State image formation in eye. 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. The sclera, or white part of the eye, protects the eyeball. The formation of focused images on the photoreceptors of the <u>retina</u> depends on the refraction (bending) of light by the <u>cornea</u> and the <u>lens</u> The cornea is responsible for most of the necessary refraction. The lens has considerably less refractive power than the cornea. Lens allows objects at various distances from the observer to be brought into sharp focus on the retinal surface. When viewing distant objects, the lens is made relatively thin and flat and has the least refractive power. For near vision, the lens becomes thicker and rounder and has the most refractive power. These changes result from the activity of the ciliary muscle that surrounds the lens. Adjustments in the size of the <u>pupil</u> (i.e., the circular opening in the <u>iris</u>) also contribute to the clarity of images formed on the <u>retina</u>.</p>	2
	<p>h) Types of bones. Ans:</p> <ol style="list-style-type: none">1. Long bone.2. Short bone.3. Flat bone.4. Irregular bone.5. Sesamoid Bones.	1 mark each
	<p>i) ABO blood grouping. 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 on red cells (and B antibody in the plasma) Group B – has only the B antigen on red cells (and An antibody in the plasma) Group AB – has both A and B antigens on red cells (but neither A nor B antibody in the plasma) Group O – has neither A nor B antigens on 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.</p>	2



j) **Distinguish between pulmonary artery and pulmonary vein.**

Ans : (Any 2)

Pulmonary artery	Pulmonary vein
1. Pulmonary artery carries blood from the right ventricle of the heart to the lungs for the oxygenation.	1. Pulmonary vein carries oxygenated blood from the lungs to the left atrium of the heart.
2. Pulmonary artery carries deoxygenated blood.	2. Pulmonary vein carries oxygenated blood.
3. Pulmonary artery carries deoxygenated blood.	3. Pulmonary vein carries oxygenated blood.
4. Pulmonary artery is connected to right ventricle of the heart	4. Pulmonary vein is connected to left atrium of the heart
5. Pulmonary artery divides into two; each artery carries blood to each of the lungs.	5. Pulmonary vein divides into four; each pair of veins goes to each lung.
6. Wall of pulmonary artery is thick and elastic.	6. Wall of pulmonary vein is comparatively thinner.
7. Pulmonary artery consists of valves.	7. Pulmonary vein lacks valves.
8. The blood pressure in the pulmonary artery is high.	8. The blood pressure inside the pulmonary vein is comparatively low.

2

k) **Name the diseases of Respiratory system.**

Ans:

Respiratory disorders :

- 1) Bronchitis
- 2) Asthma
- 3) Respiratory tract infection
- 4) Lung cancer
- 5) Bacterial pneumonia
- 6) Pulmonary embolism

1 mark each

l) **Functions of kidney. (any two)**

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.

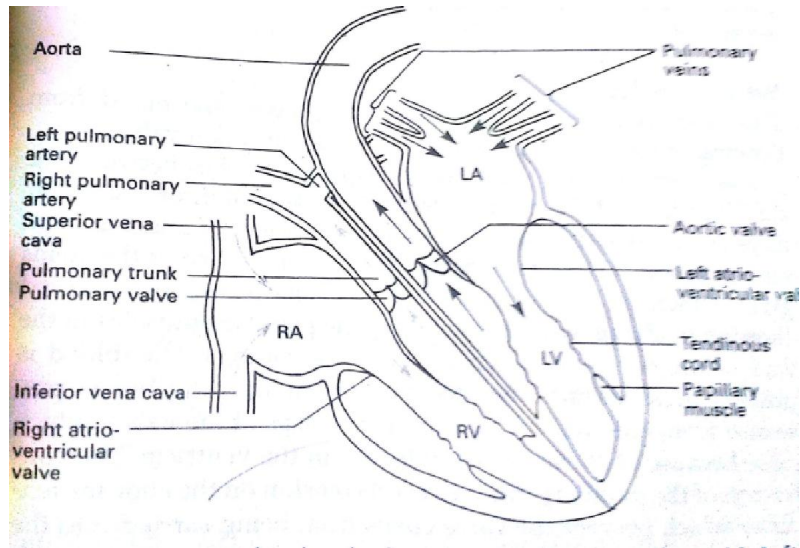
1 mark each

Q2	a)	<p>Attempt any <u>FOUR</u> :</p> <p>Explain what do you mean by repolarization & depolarization.</p> <p>Ans:</p> <p>Repolarization: Repolarization refers to the change in membrane potential that returns it to a negative value just after the depolarization phase of an action potential has changed the membrane potential to a positive value. The repolarization phase usually returns the membrane potential back to the resting membrane potential.</p> <p>Depolarization: It is the process of reversing the charge across a cell membrane. So causing action potential. In depolarization the inside of the membrane, which is normally negatively charged, becomes positive and outside negative.</p>	<p>16</p> <p>2</p> <p>2</p>
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	b)	<p>Explain structure and function of cell.</p> <p>Ans:</p> <div style="text-align: center;"> </div> <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <thead> <tr> <th style="width: 35%;">Name</th> <th>Function</th> </tr> </thead> <tbody> <tr> <td>Cell Membrane</td> <td> <ul style="list-style-type: none"> Separates the cell from outside environment Selectively permeable </td> </tr> <tr> <td>Cell Wall</td> <td> <ul style="list-style-type: none"> Additional support, protection Gives cell its shape </td> </tr> <tr> <td>Nucleus</td> <td> <ul style="list-style-type: none"> Controls the cell activities </td> </tr> <tr> <td>Nuclear membrane/ Envelope</td> <td> <ul style="list-style-type: none"> Allows material to move into & out of Nucleus (RNA pass through pores) </td> </tr> <tr> <td>Nucleolus</td> <td> <ul style="list-style-type: none"> Assembly of ribosomes take place here </td> </tr> <tr> <td>Cytoplasm</td> <td> <ul style="list-style-type: none"> Chemical reactions take place here </td> </tr> <tr> <td>Ribosome</td> <td> <ul style="list-style-type: none"> Site of protein synthesis </td> </tr> <tr> <td>Golgi Apparatus</td> <td> <ul style="list-style-type: none"> Sorts & packs protein into vesicle & transports them </td> </tr> <tr> <td>Lysosome</td> <td> <ul style="list-style-type: none"> Digests food, bacteria, worn out organelle </td> </tr> </tbody> </table>	Name	Function	Cell Membrane	<ul style="list-style-type: none"> Separates the cell from outside environment Selectively permeable 	Cell Wall	<ul style="list-style-type: none"> Additional support, protection Gives cell its shape 	Nucleus	<ul style="list-style-type: none"> Controls the cell activities 	Nuclear membrane/ Envelope	<ul style="list-style-type: none"> Allows material to move into & out of Nucleus (RNA pass through pores) 	Nucleolus	<ul style="list-style-type: none"> Assembly of ribosomes take place here 	Cytoplasm	<ul style="list-style-type: none"> Chemical reactions take place here 	Ribosome	<ul style="list-style-type: none"> Site of protein synthesis 	Golgi Apparatus	<ul style="list-style-type: none"> Sorts & packs protein into vesicle & transports them 	Lysosome	<ul style="list-style-type: none"> Digests food, bacteria, worn out organelle 	<p>2</p> <p>2</p>
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c) Describe the flow of blood through the interior of Heart.

Ans:



Heart pumps the blood to drive the blood vessels as well as it receives the blood from different parts of the body. Blood collects from all parts of body by superior and inferior vena cava which are the largest veins collect deoxygenated blood in right atria, through right atria blood passes towards right ventricle. A right ventricle collect blood by atrioventricular orifice guarded by tricuspid or right atrioventricular valve, from here passes towards through pulmonary artery or trunk. After oxygenation of blood again is collected by left sided arteria by four pulmonary veins. After collection in left atrioventricular orifice or bicuspid valve. From left ventricle it passes outside the heart to provide different parts of body through aorta.

4

d) Define the following terms :

- i) Blood pressure
- ii) Cardiac output
- iii) Heart rate
- iv) Blood flow

Ans :

i) Blood pressure : Blood pressure is the force of blood against the walls of the arteries as the heart pumps blood throughout the body.

ii) Cardiac output : It is defined as the quantity of blood pumped by the heart in one minute. Cardiac output = Stroke volume x Heart rate.

iii) Heart rate: Heart rate is the speed of the heartbeat measured by the number of contractions of the heart per minute (bpm)

iv) Blood flow : Blood flow is movement of blood through a vessel, tissue, or organ. Blood flow is denoted in terms of volume of blood flowing in unit time.

1 mark each

e) **Define :** i) Vital capacity ii) Tidal value iii) FRC iv) ERV.

Ans :

i) Vital Capacity: The greatest volume that can be inspired from the resting end expiratory position.

ii) Tidal value : The volume of gas inspired or expired (exchanged with each breath) during normal quiet breathing is known as tidal volume.

iii) FRC (Functional residual capacity) : This is the amount of air passages in the air the end of quiet expiration.

iv) ERV (Expiratory reserve Volume) : The volume of gas remaining after a normal expiration less the volume remaining after a forced expiration.

1 mark each

f) **Draw a labeled diagram of respiratory system & describe the mechanism of respiration.**

Ans :

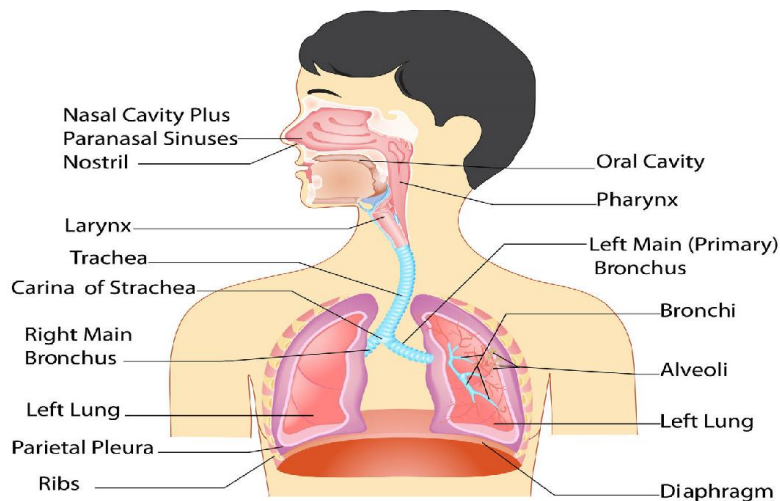


Fig : Respiratory System

Mechanism of respiration :

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

Diagram = 2 marks

Description = 2 marks

	<p>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.</p>	
Q3	<p>Attempt any <u>FOUR</u> :</p>	16
a)	<p>Name any two instrument related to respiration and state the function of pharynx and larynx. Ans: Instrument related to respiration : (any 2) 1.Spirometer 2. Ventilator 3. Respiration rate meter 4. X-ray 5. Nebulizer</p> <p>Pharynx Function- Passageway for air and blood. The pharynx is an organ involved in both the respiratory and the digestive system. Larynx Function – It consist of vocal cord which helps for production of voice.</p>	<p>2</p> <p>1</p> <p>1</p>
b)	<p>Draw and label the digestive system. Ans:</p> <p style="text-align: center;">Figure 1-1. The digestive system.</p>	4

c) Draw a labeled diagram of T.S. of Kidney.

Ans:

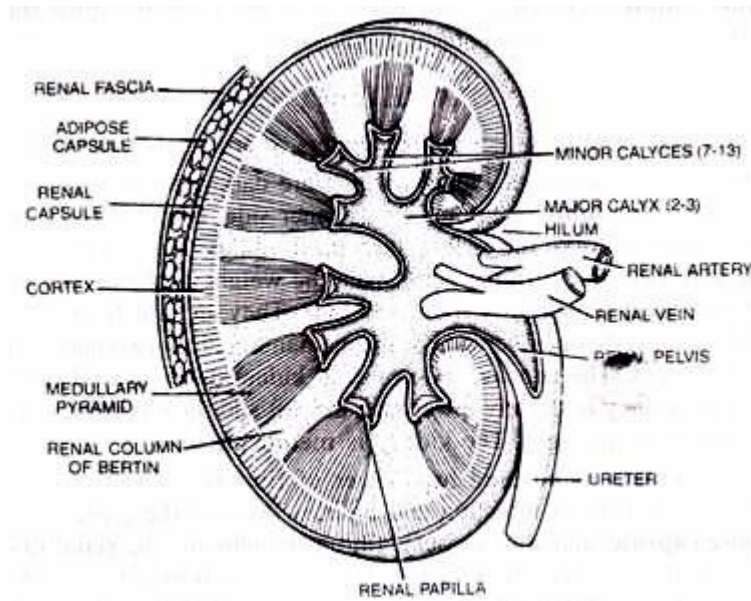
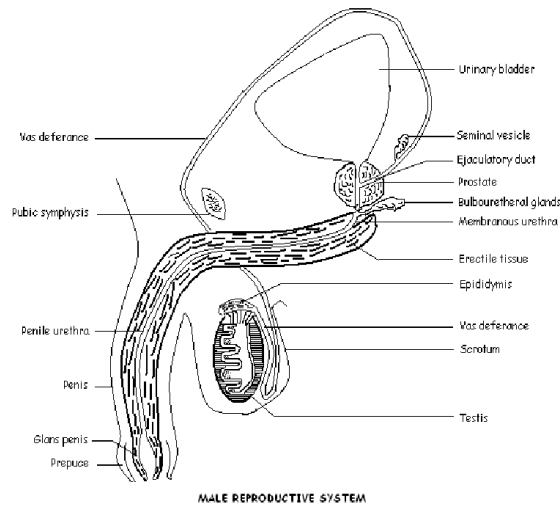


Fig. 19.5. L.S. human kidney (posterior view).

4

d) Describe male reproductive system.

Ans:



Male reproductive system consist of male genital organs as follows

- a) Testis
- b) epididymis
- c) Deferent duct
- d) Seminal vesicles
- e) Ejaculatory duct
- f) Penis
- g) Prostate
- h) Bulbouretral glands

a) Testis –

These are reproductive glands in male suspended in scrotum by

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spermatic cord. Testes are covered by pouch of peritoneum called tunica vaginalis. Tubules are supported by connective tissue which contains group of interstitial cells which secrete Testosterone hormone.

b) Epididymis –

It is a fine tightly coiled tube located and attached to back of testis. Seminiferous tubule of testis opens in to it and leads to deferent duct.

c) Deferent duct –

It is a continuation of epididymis (Tail of epididymis) passes through inguinal canal runs between base of urinary bladder and return to join duct of seminal vesicle at the base of prostate gland.

d) Seminal vesicle –

This is the gland located at the base of bladder and rectum. It secretes alkaline fluid containing nourishment which forms a large part of seminal fluid.

e) Ejaculatory duct –

It is formed by union of deferent duct and seminal vesicles. It ends at the opening of prostate utricle on posterior wall of urethra in prostate gland.

f) Penis –

It is tubular organ supplied by large venous sinuses which can fill to causes erection of penis. It passes urethra. At the tip there is enlargement called glans penis. Glans is covered by loose double fold of skin called prepuce or foreskin.

g) Prostate –

These glands situated around urethra at the neck of urinary bladder. It is a gland of chestnut size and contains opening of ejaculatory duct. It opens to secrete semen (fluid) which provides nourishment to sperm by its alkaline nature.

h) Bulbourethral gland –

These are situated on each side of membranous part of urethra. Its duct opens in to spongy part of urethra. It secretes substance which forms part of seminal fluid.

e) Explain the functions of androgens and oestrogens.

Ans:

Androgens:

Androgens are essential for the propagation of the species and for establishment and maintenance of the quality of life of males through their support of sexual behavior and function, muscle strength, and sense of well-being. In carrying out its many functions, T acts both as hormone and prohormone. Androgen, any of a group of hormones that primarily influence the growth and development of the male reproductive system. The predominant and most active androgen is testosterone, which is produced by the male testes. The other androgens, which support the functions of testosterone, are produced mainly by the adrenal cortex—the outer portion of the adrenal glands—and only in relatively small quantities.

Oestrogens :

Estrogens are present in significant amounts in both men and women. They are present significantly higher amounts in women after menarch (onset of menstrual

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puberty) until menopause (session 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.

f) **Sketch the structure of eye and label it.**

Ans :

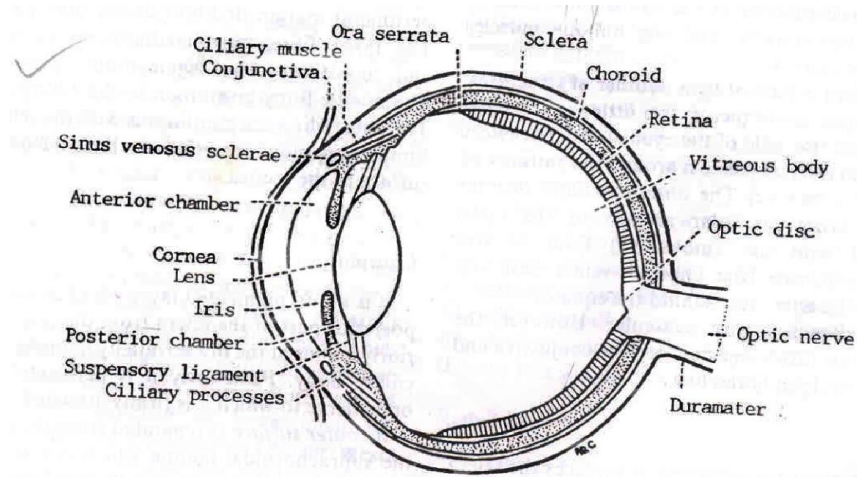


Fig. 19.1. Sagittal section through the eyeball.

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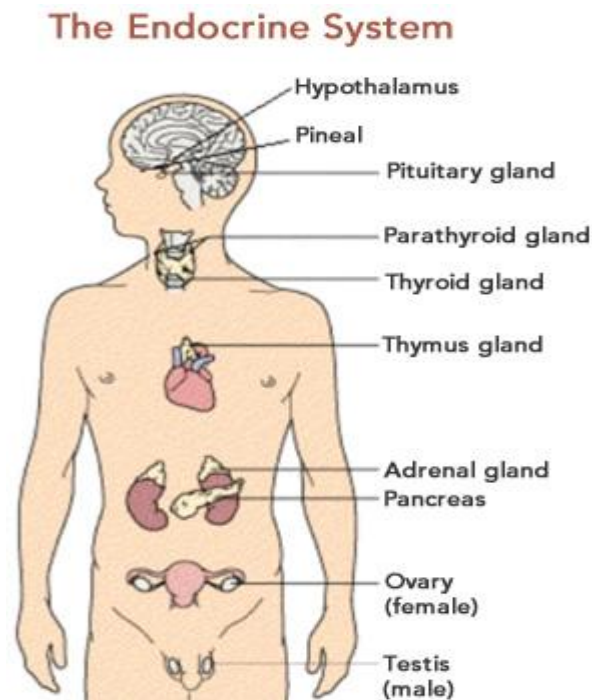
Q4

Attempt any **FOUR**:

16

a) **Name the Endocrine glands with the help of neat diagram.**

Ans:



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b) **Draw a labeled diagram showing different parts of brain.**

Ans:

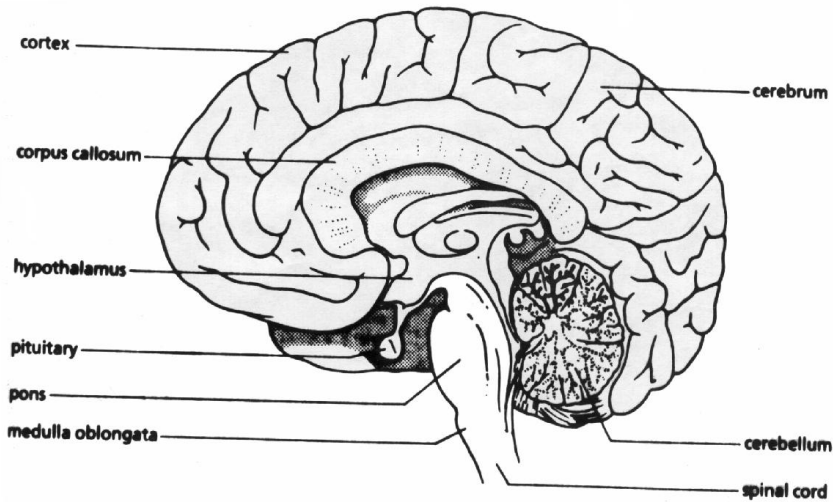


Fig : The brain

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c) **Write the importance of spinal cord.**

Ans:

The spinal cord works a bit like a telephone switchboard operator, helping the brain communicate with different parts of the body, and vice versa. Its three major roles are:

- To relay messages from the brain to different parts of the body (usually a muscle) in order to perform an action
- To pass along messages from sensory receptors (found all over the body) to the brain
- To coordinate reflexes (quick responses to outside stimuli) that doesn't go through the brain and are managed by the spinal cord alone.

4

d) **Draw labeled diagram of anatomy of ear.**

Ans :

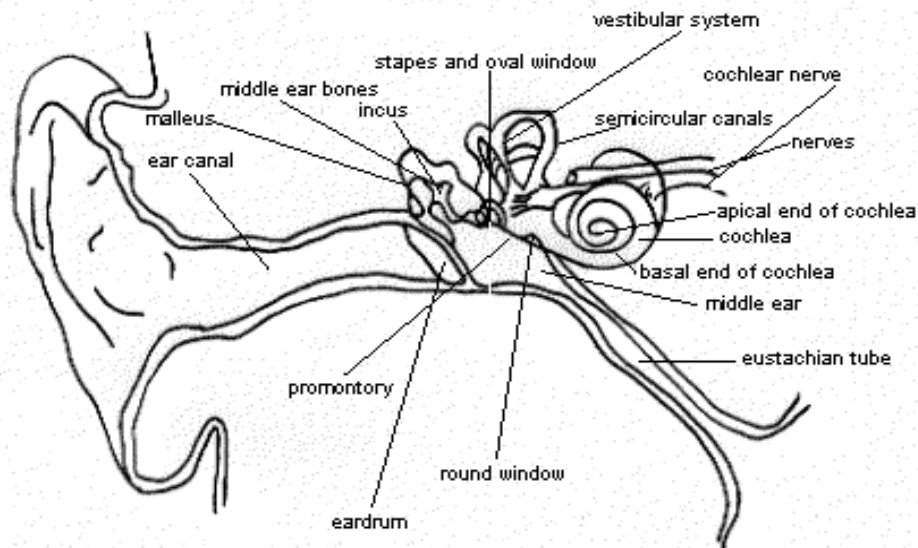


Fig : Anatomy of Ear

4



	<p>e) Describe the process urine formation. 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, 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 liters of fluid to the tubules which consist of 2% of urea. It helps to maintain pH of about 7.4.</p> <p>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.</p>	4
	<p>f) List the structure included in digestive system. Ans: The following are the organs of digestive system</p> <p>1)Alimentary canal - Consists of a)Mouth cavity b)Pharynx c) Esophagus d)Stomach e) Small Intestine f)Large Intestine (Ascending colon, transverse colon, descending colon, Sigmoid colon) g)Rectum and anal canal.</p> <p>2)Accessory organs – a)Three pairs of salivary glands b)Pancreas c)Liver and the billiary tract.</p>	4
Q5	Attempt any <u>FOUR</u> of the following:	16
	<p>a) Name diseases, their causes and instruments used related to Nervous system. Ans : Diseases, their causes related to Nervous system :</p> <p>- Trauma : Any type of traumatic brain injury (TBI) or injury done to the spinal cord can result in a wide spectrum of disabilities in a person.</p> <p>- Degeneration : Degenerative spinal disorders involve a loss of function in the spine..</p> <p>- Tumors : A tumor is an abnormal growth of body tissue. In the beginning, tumors can be noncancerous, but if they become malignant, they are cancerous.</p> <p>- Stroke : A stroke is an interruption of the blood supply to the brain. This can happen when a blood vessel is blocked by a blood clot or when a blood vessel ruptures, causing blood to leak to the brain.</p> <p>- Autism : Autism is a neurodevelopmental disorder that is characterized by restricted and repetitive patterns of behavior and persistent deficits in social interaction and</p>	2



communication.

- Bipolar disorder :

Bipolar disorder is a serious illness of the nervous system.

- Catalepsy :

Catalepsy is a nervous disorder characterized by immobility and muscular rigidity, along with a decreased sensitivity to pain.

- Depression :

Major depressive disorder, otherwise known as depression, is a disorder that is characterized by a pervasive and persistent low mood that is accompanied by low self-esteem and by a loss of interest or pleasure in normally enjoyable activities.

- Encephalitis :

Encephalitis is an inflammation of the brain. well as birds and horses.

- Epilepsy/Seizures :

Epilepsy is an unpredictable, serious, and potentially fatal disorder of the nervous system, thought to be the result of faulty electrical activity in the brain.

- Meningitis :

Meningitis is an inflammation of the meninges (membranes) of the brain and spinal cord. It is most often caused by a bacterial or viral infection.

- Migraine :

A chronic, often debilitating neurological disorder characterized by recurrent moderate to severe headaches, often in association with a number of autonomic nervous system

- Alzheimer's :

The ultimate cause is unknown. The clinical sign of Alzheimer's is progressive cognition deterioration.

- Parkinson's :

Parkinson's disease, or PD, is a progressive illness of the nervous system. Caused by the death of dopamine-producing brain cells that affect motor skills and speech.

The instruments related to nervous system are :

1. Electroencephalograph
2. CT
3. MRI
4. Nerve muscle stimulator.
5. X-ray

2

b) State composition of blood and mention functions of each constituent.

Ans:

Composition of Blood

Blood consist of solid and liquid part. Solid part contains blood cells (Corpuscles) and liquid part contains plasma. Blood cells form 45% and plasma form 55% of its whole contains.

PLASMA

Plasma or fluid part of blood is clear, straw colored watery fluid.

Component of plasma

Water- It forms 90 %of whole



	<p>Mineral salt- includes chlorides, phosphates and carbonates of sodium, potassium and calcium. Plasma protein-Albumin, globulin, prothrombin and heparin. Foodstuff in their simplest form- glucose, amino acid, fatty acids, glycerol and vitamins Gases in solution- oxygen, carbon dioxide, nitrogen. Waste products from tissue- urea, uric acid and creatinine. Antibodies and autotoxins- these protects against bacterial infection. Hormones- from duct gland Enzymes Salts- they mainly maintains electrolyte balance. In the blood ,there are three types of blood cells or corpuscles a) Erythrocytes or red blood cells. b) Leucocytes or white blood cells. c) Thrombocytes or platelets.</p>	4
c)	<p>Define action potential and resting membrane potential. Ans : Action Potential : An action potential is a very rapid change in membrane potential that occurs when nerve cell membrane is stimulated. Specifically, the membrane potential goes from the resting potential (typically -70mV) to some positive value (typically about +30 mV) in a very short period of time (just a few milliseconds). Resting membrane potential : It is the electrical potential is present between the inside and outside cell when in arresting state. The resting membrane potential of a cell is about -70 mV this means that the inside of the neuron is 70 mV less than the outside. At rest, there are relatively more sodium ions outside the cell and more potassium ions inside that cell.</p>	2 2
d)	<p>Describe types of muscles and their functions. Ans: Types of muscles : (Any 2) i) Skeletal muscle : - They are Voluntary muscles - They give shape, form and appearance to the body. - They protects the vital organ of the body. - They keep the joints in proper position - They produce movements of the body. - They help in vinous return and lymphatic drainage ii) Smooth muscle : - They are not under the control of the will ie. They are involuntary muscles - They have only one central nucleus. - There is no distinct sarcolemma but very fine membrane surrounds each fiber. - They are short around 50 μm to 500 μm - They forms the walls of viscera example stomach, intestine, urinary bladder, uterus, blood capillaries etc iii) Cardiac muscle : Cardiac muscles found only in heart, They show cross stripes.They are arranged longitudinally as in strained muscle and characteristically red in color and involuntary in nature. Impulses spread from cell to cell across intercalated discs.Heart is made up of specialised cardiac muscle cells which contract automatically i.e. without neural</p>	4



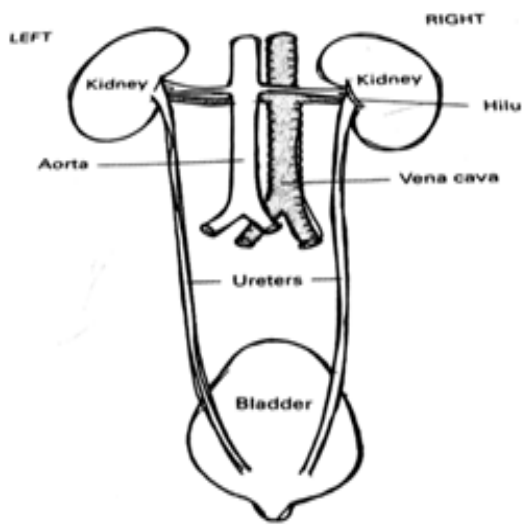
	<p>stimulation. Cardiac muscles are the contracting cells which allow the heart to pump. The specific function of the cardiac muscle is to control the contraction and relaxation of the heart.</p>	
e)	<p>Describe cerebellum with its function. Ans: Cerebellum is largest part of hind brain situated in posterior 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</p> <p>Functions :</p> <ol style="list-style-type: none">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.	<p>2</p> <p>2</p>
f)	<p>List the diseases of nervous system and list the instruments used related to nervous system. Ans: Diseases of nervous system : (Any 2)</p> <ul style="list-style-type: none">- Addiction- Arachnoid cysts- Attention deficit/hyperactivity disorder (ADHD)- Autism- Bipolar disorder- Catalepsy- Depression- Encephalitis- Epilepsy/Seizures- Infection- Locked-in syndrome- Meningitis- Migraine- Multiple sclerosis- Myelopathy	<p>2</p>



	<ul style="list-style-type: none">- Alzheimer's- Parkinson's <p>The instruments related to nervous system are :</p> <ol style="list-style-type: none">1. Electroencephalograph2. CT3. MRI4. Nerve muscle stimulator.5. X-ray	2
Q6	Attempt any <u>FOUR</u>:	16
a)	<p>Explain the digestion of food by various digestive juices secreted by the digestive organs of digestive system.</p> <p>Ans:</p> <p>The five major organs that secrete digestive juices are the salivary glands, stomach pancreas, liver and small intestine.</p> <p>Salivary Glands</p> <p>The main salivary glands are found in the cheeks, under the tongue and around the jaw. They secrete about 1 quart of saliva each day.</p> <p>Function of saliva :</p> <ol style="list-style-type: none">1. Amylase, also called ptyalin, is an enzyme in saliva that breaks down carbohydrates. Carbohydrates are found in foods like bread and rice.2. Lysozyme is another salivary enzyme, which helps to keep the mouth free from germs.3. Saliva also contains mucus, which coats the food and enables each bite to travel smoothly through the digestive tract. <p>Stomach</p> <p>Gastric juices are secreted from glands lining the stomach.</p> <p>Function of Gastric juices:</p> <ol style="list-style-type: none">1. To break down food in the stomach and kill bacteria.2. The gastric juices break down the food in the stomach.3. This nutrient is passed into the small intestine for further digestion and absorption to occur.4. Gastric juices allow the body to absorb B-12.5. A necessary nutrient for nervous system function and the production of blood cells.6. Gastric juice excretes toxins, heavy metals and certain drugs like opium. <p>Pancreas</p> <ol style="list-style-type: none">1. Pancreatic fluid contains digestive enzymes that help to further break down the carbohydrates, proteins, and lipids in the chyme.2. It makes “enzymes to digest proteins, fats, and carbs in the intestines” and produces the hormones insulin and glucagon. <p>Liver</p> <p>Functions of Bile Juice</p> <ol style="list-style-type: none">1. The liver produces a greenish juice called bile, which is stored and concentrated by the gall bladder.2. Function of bile juice.	4



		<p>3. It stimulates the functions of the proteolytic enzymes and Amylase.</p> <p>4. It dissolves fatty acid, and glycerol.</p> <p>5. It coordinates with lipase to convert the fat into fatty acids.</p> <p>6. It helps in the absorption of the fatty acids and glycerol.</p> <p>7. With the help of other digestive juices it neutralizes the acidic nature of food.</p> <p>Small intestine.</p> <p>1. MALTASE digest maltose to glucose</p> <p>2. SUCRASE digests sucrose to glucose and fructose.</p> <p>3. LACTASES digest lactose to glucose and galactose.</p> <p>4. LIPASE digests fats to fatty acids.</p> <p>5. PEPTIDASES digest small peptides to single amino acids.</p>	
	b)	<p>Define the term ‘ Reflex Action’ and give its two examples.</p> <p>Ans:</p> <p>Reflex Action :It is the automatic motor response given by the spinal cord to the sensory stimulus without involving brain in action. Reflex Actions are the part of defense mechanism of the body. These actions occur very rapidly than the voluntary actions.</p> <p>Examples : (Any 2)</p> <ul style="list-style-type: none">- The quick closing of an eyelid if eye is touched or something threatens to touch it.- The sudden withdrawal of the hand if fingers touches something hot.- movement of stomach, small intestine.- The quick recovery of the balance of body to prevent falling after a slip.- A sudden coughing attack if a crumb is inhaled.	<p style="text-align: center;">2</p> <p style="text-align: center;">2</p>
	c)	<p>Explain the conduction system of heart.</p> <p>Ans :</p> <p>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>	4
	d)	<p>List two diseases and two related instruments used for cardio vascular system.</p> <p>Ans :</p> <p>Diseases related to cardio vascular system : (Any 2)</p> <ul style="list-style-type: none">- Coronary artery diseases- Heart failure- Abnormal heart rhythms, or arrhythmias- Heart Attack- Coronary artery disease (narrowing of the arteries)- Heart valve disease- Congenital heart disease- Heart muscle disease (cardiomyopathy)- Pericardial disease- Aorta disease and Marfan syndrome- Vascular disease (blood vessel disease)	2

	<ul style="list-style-type: none"> - Cardiac arrest - High blood pressure <p>Instruments related to cardio vascular system : (Any 2)</p> <ul style="list-style-type: none"> - ECG machine. - Defibrillator. - Pacemaker. - Heart lung machine. - Heart rate meter. - Phonocardiograph. - Sphygmomanometer. 	2
	<p>e) Define joints and explain the different types of joints present in human body.</p> <p>Ans: Definition of Joint : The union of two or more bones of the skeleton is described as joint or articulation. Or A joint is the side at which any two or more bones come together. Types of joints :</p> <ol style="list-style-type: none"> 1. Fibrous: The bones of fibrous joints are joined by fibrous tissue, such as the sutures in the skull or the pelvis. Fibrous joints allow no movement at all. Ex. Teeth 2. Cartilaginous: The bones of cartilaginous joints are joined by cartilage, such as the sternocostal joint between the sternum and first rib. These joints allow a very small amount of movement. Eg: Vertebrae in the spine. 3. Synovial : Eg: Elbow/Knee, Top of the neck (atlas and axis bones), Shoulder/Hip, Wrist/MCP & MTP joints, metatercarpal joints 	2
	<p>f) Draw the structure of Urinary bladder and explain the function of it.</p> <p>Ans :</p> <div style="text-align: center;">  <p>The diagram illustrates the urinary system in a frontal view. At the top, two kidneys are shown, labeled 'LEFT' and 'RIGHT'. Each kidney has a central indentation called the 'Hilus'. Below the kidneys, the 'Aorta' and 'Vena cava' are shown as major blood vessels. The 'Ureters' are shown as two tubes descending from the kidneys to the 'Bladder' at the bottom. The bladder is a sac-like structure with a rounded bottom.</p> </div> <p style="text-align: center;">Fig: The urinary System</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.

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. 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.

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 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. Urine collected in the bladder is discharged through the urethra, which ends at the external urethral orifice.