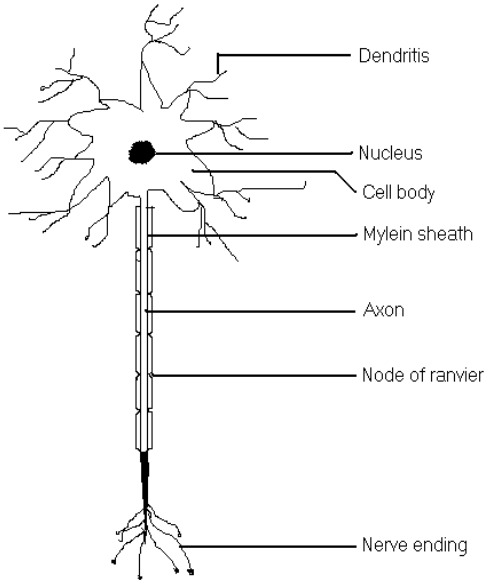
WINTER - 2019 EXAMINATION

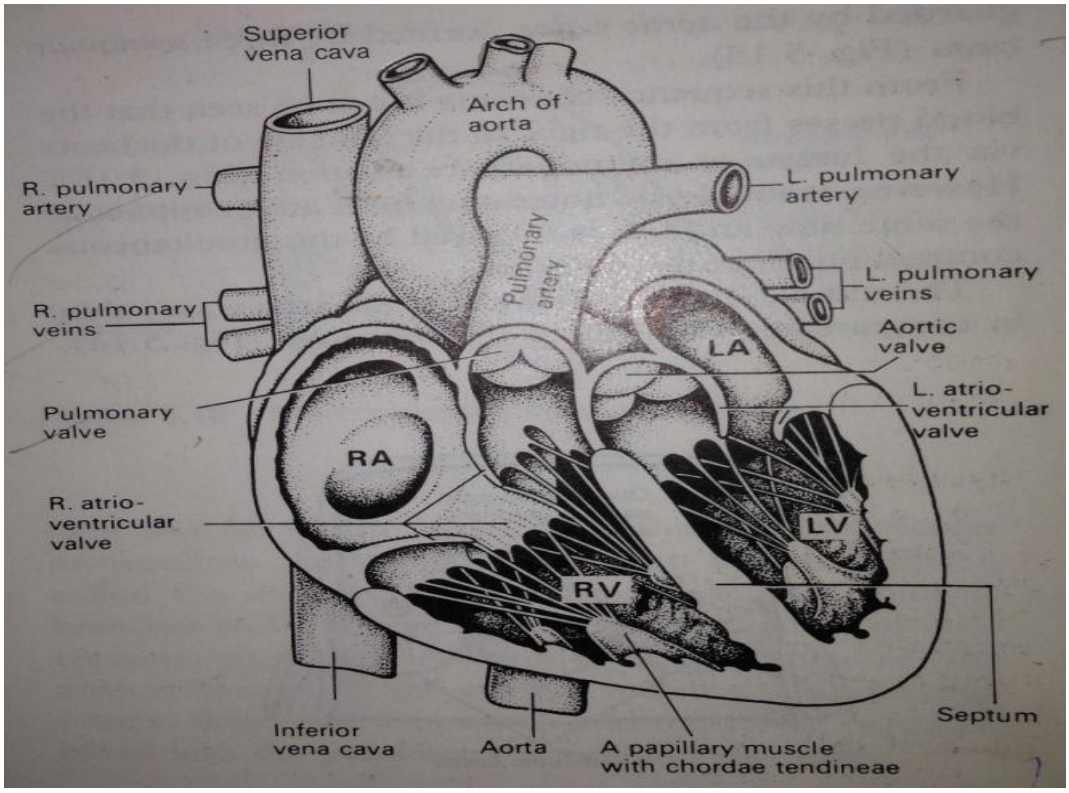
Subject Name: Human Anatomy and Physiology **Model Answer** **Subject Code:** **22347**

Important Instructions to examiners:

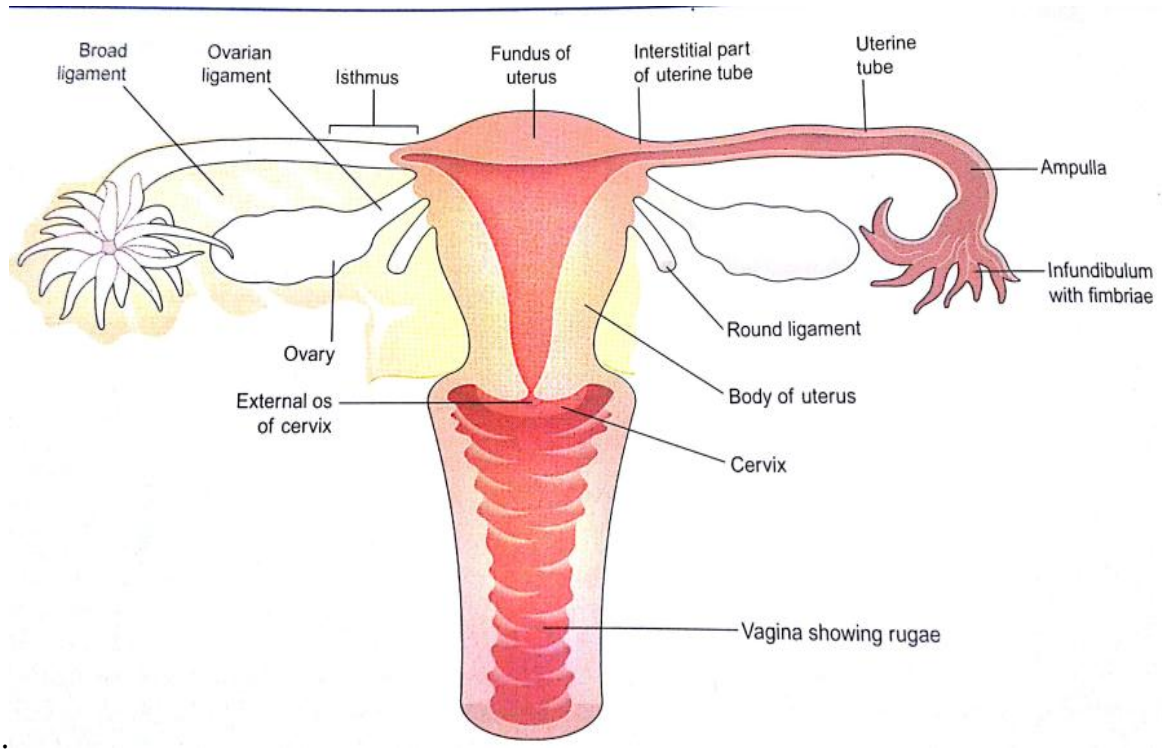
1) The answers should be examined by key words and not as word-to-word as given in the model answer scheme.
2) The model answer and the answer written by candidate may vary but the examiner may try to assess the understanding level of the candidate.
3) The language errors such as grammatical, spelling 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.

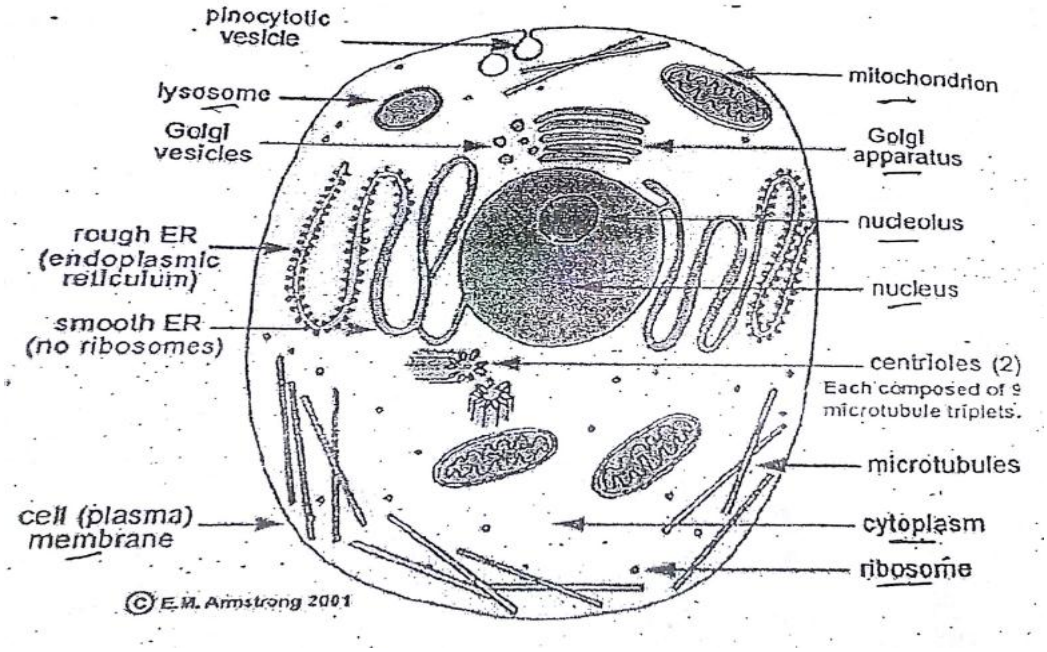
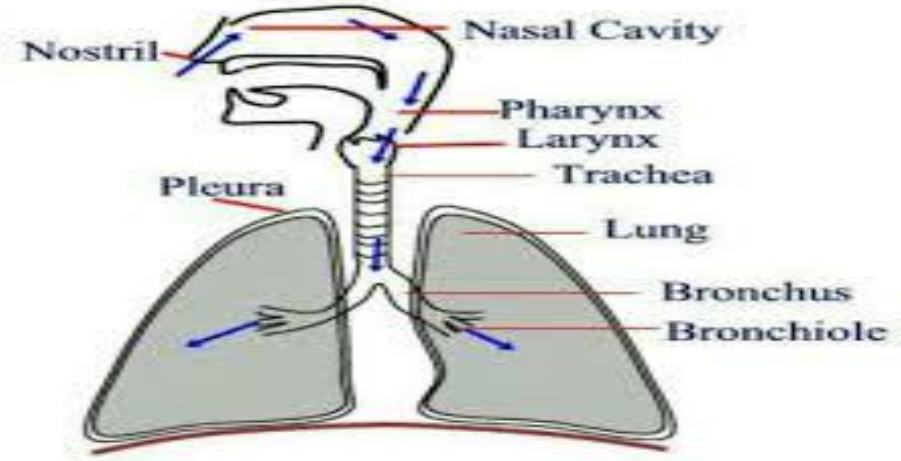
Q. No.	Sub Q.N.	Answer	Marking Scheme
Q.1		**Attempt Any FIVE of the following :**	**10 M**
	a)	**List any two functions of joints.** **Ans:** **Functions of joints:** 1. It allows movement in one direction only. 2. It allows rotational movement such as elbow. 3. It gives gliding movement. 4. Two pairs of articular surfaces allow movement in one direction only. For ex Knee.	**02 M**
	b)	**Define heart rate and mention its normal value.** **Ans:** **Definition of heart rate:** Heart rate is the speed of the heartbeat measured by the number of contractions of the heart per minute (bpm). **OR** The number of heart beats per unit of time usually per minute. **Heart rate normal value:** Normal resting heart rates range from 60–100 bpm.	**01 M** **01 M**
	c)	**Name the instruments that can be helpful to doctor to examine the respiratory tract.** **Ans:** **Instruments related to examine the respiratory tract:** 1. Spirometer 2. Ventilator 3. Respiration rate meter 4. X-ray 5. Nebulizer	**02 M (Any Two)**
	d)	**Give two functions of skin** **Ans:** **Functions of skin:** 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.	**02 M**

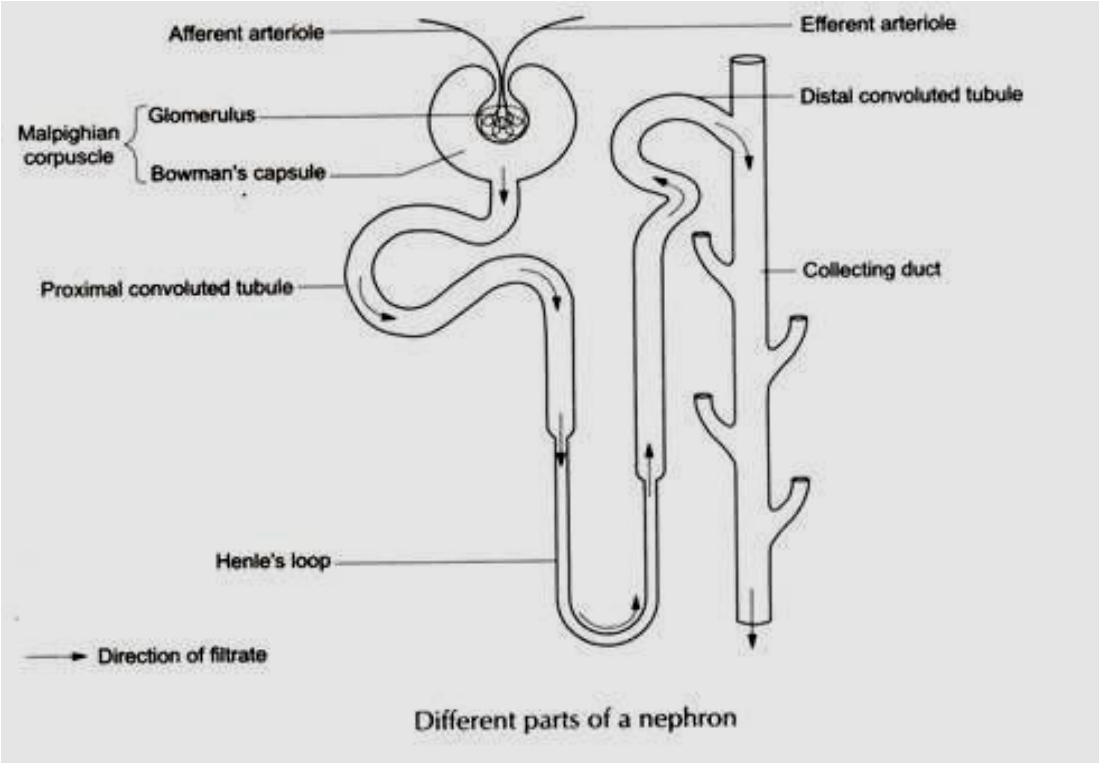
		4. Secretion of sweat and sebum. 5. Regulation of body temperature. 6. Synthesis of vitamin D from ergo sterol of skin by the action of UV rays of sun.	
	e)	**List endocrine glands.** **Ans:** **Endocrine glands:** 1. Pineal gland 2. Pituitary gland 3. Pancreas 4. Ovaries 5. Testes 6. Thyroid gland 7. Parathyroid gland, 8. Hypothalamus and 9. Adrenal glands.	**02 M (Any Two)**
	f)	**Draw the structure of Neuron.** **Ans:**  **Fig : Structure of Neuron**	**02 M**
	g)	**Name the organs involved in digestive system.** **Ans:** **Organs involved in digestive system:** 1) Mouth. 2) Pharynx. 3) Oesophagus. 4) Stomach. 5) Small intestine. 6) Large intestine. 7) Rectum. 8) Anus.	**02 M (Any Two)**

Q.2		Attempt Any THREE of the following :	12 M
	a)	**Explain anatomy of Heart with a neat labeled diagram.** **Ans:**  **Fig: Structure of 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: 1. Right atrium 2. Right ventricle 3. Left atrium 4. 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.	**02 M** **02 M**
	b)	**Name any four parts involved in respiratory system with one function of each.** **Ans:** **Parts involved in respiratory system:** **Nose:** It conducts respiration process mainly filtration of air, Temperature maintenance of inspired air (heating and cooling). **Pharynx:** It controls passing of air and food. **Larynx:** It consists of vocal cord which helps for production of voice.	**04 M**

		Trachea: It helps to expand size of oesophagus during swallowing and deglutination of food. **Lungs:** It performs respiration process and exchange of gases.	
	c)	**Calculate the cardiac output, if a person has resting heart rate of 74 beats/minute and stroke volume of 70 ml/beat. Judge whether person will need medication on the basis of provided data.** **Ans:** Cardiac output = Stroke volume X Heart rate. Stroke volume = 70 ml/beat Heart rate = 74 beats/minute So cardiac output = 5180 ml As it is the normal range of cardiac output so the person does not need any medication. (or any relevant answer)	**03 M** **01 M**
	d)	**Name any two hormones with its functions secreted by thyroid gland.** **Ans :** **Hormones secreted by thyroid gland:** Thyroid gland is located in front of the neck. The thyroid gland uses iodine from food to make two thyroid hormones: 1. Triiodothyronine (T3) 2. Thyroxine (T4). Thyroid hormones act on nearly every cell in the body. These hormones play an important role in regulation of body weight, energy levels, internal temperature, skin, hair, nail growth, bone growth. T_3 and T_4 are partially composed of iodine. A deficiency of iodine leads to decreased production of T_3 and T_4 enlarges the thyroid tissue and will cause the disease known as simple goitre. **Triiodothyronine (T3):** T3 is a second thyroid hormone that is produced by the thyroid gland, but also in other tissues through deiodination (enzymatic conversion) of T4. T3 helps maintain muscle control, brain function and development, heart and digestive functions. It also plays a role in the body's metabolic rate and the maintenance of bone health. **Thyroxine (T4):** Thyroxine (T4) is produced by the thyroid gland under regulation from the hypothalamus and pituitary gland. The feedback loop signals to the hypothalamus in to release thyrotropin-releasing hormone, which then stimulates the pituitary gland to release the thyroid stimulating hormone.	**02 M** **02 M**
	Q.3	**Attempt Any <u>THREE</u> of the following :**	**12 M**
	a)	**A patient with blood group B requires immediate blood transfusion, suggest type of blood that can be given to him. Also justify the reason behind it.** **Ans:** Here a patient with blood group B requires blood group B or blood group O type of blood. Because red blood cells have different antigens in the outer surface of their plasma membrane. 1. Group A – has only the A antigen on red cells (and B antibody in the plasma) 2. Group B – has only the B antigen on red cells (and A antibody in the plasma) 3. Group AB – has both A and B antigens on red cells (but neither A nor B antibody in the plasma) Type AB blood is considered the "universal recipient" because people with this type can receive any blood type. 4. Group O – has neither A nor B antigens on red cells (but both A and B antibody are in the plasma). Type O– blood is considered the "universal donor" because it can be donated to people of any blood type.	**02 M**

		If the donar has red blood cells with the antigens not present in the red blood cells of the recipient, the immune system of the recipient recognizes these cells as foreign substances and triggers a defense response. Which produce specific antibodies against those antigens. The transfused red blood cells are then destroyed by these antibodies and the recipient may even die. Therefore patient with blood group B will accept blood group B or blood group O type of blood only.	**02 M**
	b)	**Draw and explain female reproductive system.** **Ans:**  **Fig :Female Reproductive system** Female reproductive system consist of internal and external genital organs a) Internal Organs: 1) ovaries 2) uterine tube 3) vagina. b) External organs: 1) mons pubis 2) labia majora and minora 3) clitoris 4) vestibule of vagina 5) Greater vestibular gland. 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. The major organs of the female reproductive system include: **Vagina**: This muscular tube receives the penis during intercourse and through it a baby leaves the uterus during childbirth. **Uterus**: This organ holds and nourishes a developing fetus, if an egg was properly fertilized. **Ovaries**: The female gonads, the ovaries produce ova. When one matures, it is released down into a fallopian tube. **Fallopian tubes**: These small tubes transport ova from the ovaries to the uterus. This is where an egg waits to be fertilized.	**02 M** **02 M**

	c)	**Draw a labeled structure of cell showing various organelles.** **Ans:**  **Fig :Structure of Cell**	**04 M**
	d)	**Define blood pressure and give its normal value in adults. Also name the instrument used to measure blood pressure.** **Ans:** **Blood Pressure:** It is the force or pressure that the blood exerts on the walls of blood vessels. **Normal value of blood pressure :** 1) Systolic blood pressure: 100 to120 mm Hg 2) Diastolic blood pressure: 60 to 80 mm Hg. **Instrument used to measure blood pressure is Sphygmomanometer.**	**02 M** **01 M** **01 M**
Q. 4		**Attempt Any <u>THREE</u> of the following :**	**12 M**
	a)	**Normally a person breath air in and he bring oxygen into lungs, shows the pathway of air inside the body with suitable diagram and explain it.** **Ans:**  **Fig: Pathway of air inside the body**	**02 M**

		The pathway of air in the respiratory system starts with the external organs of the nose and mouth. Air enters through the nose, moves through the nasal cavity, the pharynx, the larynx, enters the trachea, moves through the bronchi and bronchioles and then through the alveoli. **Nose:** Air is inhaled through the nostrils (and sometimes through the mouth) where it is filtered by the hairs and cilia to remove dust particles and moistened. The nasal cavity also moderates the temperature of the inhaled air. **Pharynx:** This is a common passage for food, water, and air. It leads from both the nose and the mouth and leads to both the trachea and the oesophagus. **Larynx:** This is the voice box situated just over the trachea and has a flap called the epiglottis which closes during swallowing to prevent food from entering the trachea and opens during breathing. **Trachea:** Air now enters the windpipe which is situated behind the sternum and between the two lungs. **Bronchus:** From the trachea, two bronchi enter the lungs and divide and subdivide into secondary and tertiary bronchi, getting narrower as they proceed into the lung. **Bronchioles:** The tertiary bronchi branch into fine tubules called bronchioles, the last passageways for air. **Alveoli:** Air ends its pathway in the alveoli which are tiny sacs with very fine walls. Alveoli are the site of gas exchange. These alveoli are surrounded by capillaries that connect the pulmonary arteries and veins and that enable transfer of oxygen and carbon dioxide.	**02 M**
	b)	**Describe function of nephron with a labeled diagram.** **Ans:**  Different parts of a nephron **Fig: Nephron** A nephron is the basic structural and functional unit of the kidney. It is composed of a renal corpuscle and a renal tubule. The renal corpuscle consists of a tuft of capillaries called a glomerulus and an encompassing Bowman's capsule. The renal tubule extends from the capsule.	**02 M**

		The primary function of nephron is removing all waste products including the solid wastes, and other excess water from the blood, converting blood into the urine, reabsorption, secretion, and excretion of numerous substances. As the blood passes through the glomerulus with high pressure, the small molecules are moved into the glomerular capsules and travel through tubules. The cell present in each tube absorbs different molecules excluding the glucose, water, and other beneficial molecules which are called ass the ultrafiltrate. As the ultrafiltrate molecules travel down the tubules they become more and more hypertonic, which results in more amount of water to be extracted from the ultrafiltrate before it exits the nephrons. The blood surrounding the nephron travels back into the body through the renal blood vessels, which are free of toxins and other excess substances. The obtained ultrafiltrate is urine, which travels down via the collecting duct to the bladder, where it will be stored and released through the urethra.	**02 M**
	c)	**Identify the type of endocrine gland to be treated for the following symptoms found in children and explain that gland.** **(i) Poor growth** **(ii) Vision problem** **Ans:** Pituitary gland should be treated for symptoms like Poor growth and Vision problem found in children. **Pituitary gland:** Pituitary gland is a small pea-sized gland that plays a major role in regulating vital body functions. It is referred to as the body's 'master gland' because it controls the activity of most other hormone-secreting glands. It is about the size of a pea and weighing 0.5 grams (0.018 oz) in humans. This gland sits in the sella turcica a bony hollow in the base of the skull, underneath the brain and behind the bridge of the nose. The pituitary gland has two main parts, the anterior pituitary gland and the posterior pituitary gland. The gland is attached to a part of the brain (the hypothalamus) that controls its activity. Pituitary gland synthesizes following hormones. **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.	**01 M** **03 M**
	d)	**Explain classification of bones with examples.** **Ans :** **1. Long bone:** **Function:** Long bones contain yellow bone marrow and red bone marrow, which produce	

blood cells. Long bones are hard, dense bones that provide strength, structure, and mobility. e. g. Femur, tibia and fibula.

2. Short bone.

Function: Their primary function is to provide support. Stability with little to no movement. e. g. Wrist and ankle**.**

3. Flat bone.

Function: Flat bones are bones whose principle function is either extensive protection. The provision of broad surfaces for muscular attachment. e. g. pelvic bone and scapula**.**

4. Irregular bone.

Function: Irregular bones serve various purposes in the body, such as protection of nervous tissue (such as the vertebrae protect the spinal cord). Affording multiple anchor points for skeletal muscle attachment (as with the sacrum).
Maintaining pharynx and trachea support. e. g. Vertebrae and face bone**.**

5. Sesamoid Bones.

Function: To resist pressure. To minimize friction. To alter the direction of pull of the muscle. To maintain the local circulation. e. g. patella of knee joint.

04 M

e) Differentiate between CNS and ANS (any four points)

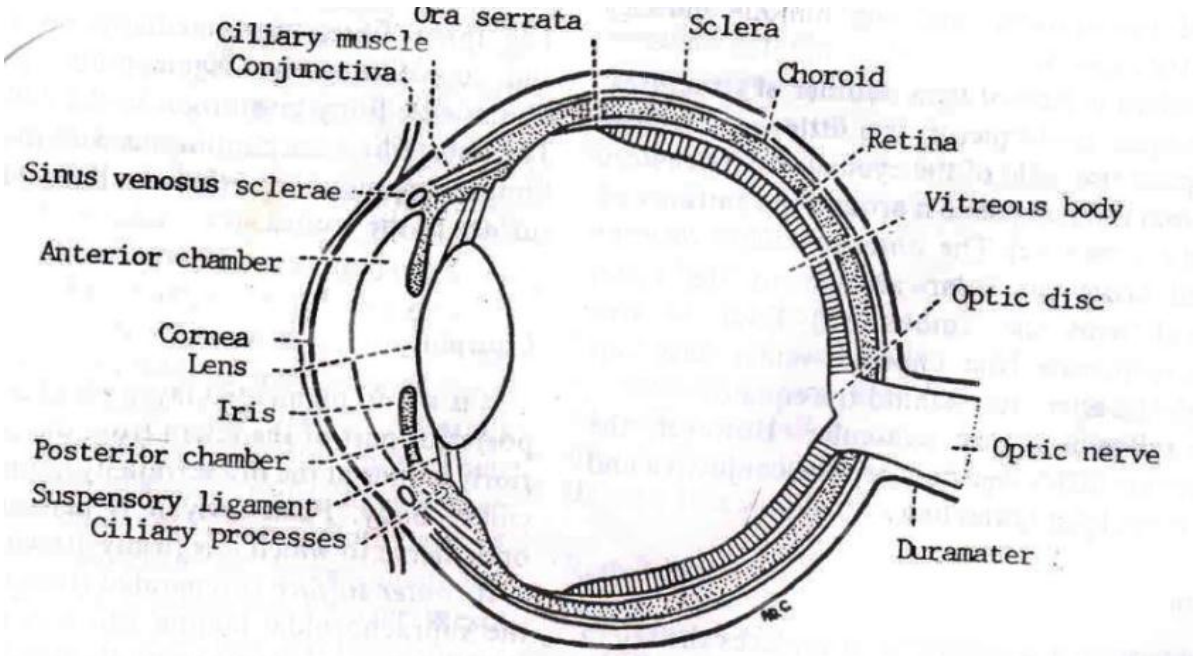
Ans:

CNS	ANS
1. 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).	1.ANS is composed of both your parasympathetic (rest and relax) system and your sympathetic (flight or fight) system
2. It relays electrical signals to all of the organs throughout the body necessary for survival. Sensory nerves that gather information from tongue i. e. Taste.	2. Autonomous nervous system (ANS) regulates basic vital functions It regulates the homeostasis of your entire body without much conscious effort.
3. It is related with sensory and motor activity.	3. It is related with the activity of the heart, various glands and the smooth muscles.
4. It enables a person to adjust with external environment.	4. It enables a person to adjust with internal environment.
5. The function of CNS occurs according to the will power of the person.	5. The function of ANS do not occurs according to the will power of the person.
6. It supplies nerves a skeletal muscles (motor nerves) and sensory nerves carry impulses from sense organ to brain.	6. It supplies nerves to smooth muscles of visceral organs e. g ureters, uterine tubes, bronchi, treachea etc. and heart and glands.
7. It carries out voluntary actions.	7. It carries out Involuntary actions.
8. The central nervous system, gives rise to the peripheral nervous system (the nerves on the periphery of the body).	8.The autonomic nervous system (ANS) is under control of central nervous system and is also part of the peripheral nervous system

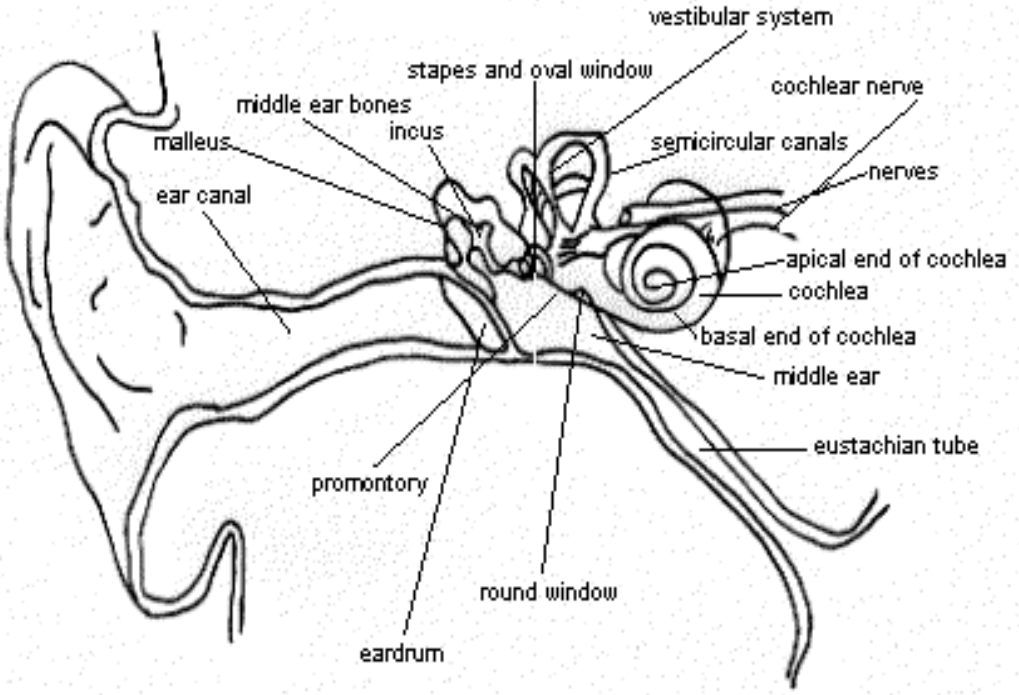
Table: Difference between CNS and ANS

04 M

Q.5 **Attempt Any <u>TWO</u> of the following :** **12 M**

	a)	**Describe mechanism of formation of urine.** **Ans:** Formation of urine takes place under three stages as follows : **1. Filtration under pressure**: It occurs at glomerular capsule where because of difference in size of vessels pressure excreted 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. **2. 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. **3. 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.	**02 M** **02 M** **02 M**
	b)	**Describe anatomy of eye with suitable diagram.** **Ans:**  **Fig: Eye** 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 **1. 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	**03 M**

		which is protective covering which reflect over inner side of eyelids. 2. **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 1. **Choroid**: It lines front part of eyeball, dark brown in colour and provides blood to other part of eye particularly to the retina. 2. **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 produce watery fluid. 3. **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 **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. **Vitreous humour**: It is colourless, transparent jelly substance which lies of posterior part of lens which maintains shape eyeball. **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	**03 M**
	c)	**Explain mechanism of hearing with a neat labeled diagram.** **Ans:** **Mechanism of hearing:** 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 conducted by conducted by collection of sound	

		waves which leads to the vibration of tympanic membrane when waves pass through external acoustic meatus which sets the ossicles (Ear ossicles carry the vibrations received by tympanic membrane to the internal ear) and fenestra vestibule. Vibrating causes vibration of perilymph causes 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.	**03 M**
		 **Fig : Structure of Ear**	**03 M**
Q.6		**Attempt Any <u>TWO</u> of the following :**	**12 M**
	a)	**Explain anatomy of digestive system with a labeled diagram.** **Ans:** **Anatomy of digestive system:** Digestion is the process by which food is broken down into smaller pieces so the body can use them to build and nourish cells and to provide energy. Digestion involves the mixing of food, its movement through the digestive tract (also known as the alimentary canal), and the chemical breakdown of larger molecules into smaller molecules. The digestive tract is a long, muscular tube that extends from the mouth through the stomach and intestines to the anus. Certain organs (such as the liver, gallbladder, and pancreas) help with this digestion. The digestive system is made up of the digestive tract. This consists of a long tube of organs that runs from the mouth to the anus and includes the esophagus, stomach, small intestine, and large intestine, together with the liver, gall bladder, and pancreas, which produce important secretions for digestion that drain into the small intestine. Digestion begins in the mouth, where chemical and mechanical digestion occurs. Saliva produced by the salivary glands is released into the mouth. Saliva begins to break down the food, moistening it and making it easier to swallow. A digestive enzyme (amylase) in the saliva begins to break down the carbohydrates (starches and sugars). One of the most important functions of the mouth is chewing.	

Once food is swallowed, it enters the esophagus, a muscular tube that is about 10 inches long. Muscular wavelike contractions known as peristalsis push the food down through the esophagus to the stomach. The stomach is a J-shaped organ that lies between the esophagus and the small intestine in the upper abdomen. The stomach has 3 main functions: to store the swallowed food and liquid; to mix up the food, liquid, and digestive juices produced by the stomach; and to slowly empty its contents into the small intestine. The stomach's strong muscular walls mix and churn the food with acids and enzymes (gastric juice), breaking it into smaller pieces. About three quarts of the gastric juice is produced by glands in the stomach every day. **03 M**

Small Intestine: Most digestion and absorption of food occurs in the small intestine. The small intestine is a narrow, twisting tube. It extends about 20 feet in length. The small intestine consists of three parts: the duodenum (the C-shaped part), the jejunum (the coiled midsection), and the ileum (the last section). The digestive process is completed here by enzymes and other substances made by intestinal cells, the pancreas, and the liver. Glands in the intestine walls secrete enzymes that breakdown starches and sugars. The pancreas secretes enzymes into the small intestine that help breakdown carbohydrates, fats, and proteins. The liver produces bile, which is stored in the gallbladder. Bile helps to make fat molecules soluble, so they can be absorbed by the body. The small intestine absorbs the nutrients from the digestive process. Undigested material travels next to the large intestine.

Large Intestine: The large intestine forms an upside down U over the coiled small intestine. It has three parts: the cecum, the colon, and the rectum. The main job of the large intestine is to remove water and salts (electrolytes) from the undigested material and to form solid waste that can be excreted. He remaining contents of the large intestine are moved toward the rectum, where feces are stored until they leave the body through the anus as a bowel movement. **03 M**

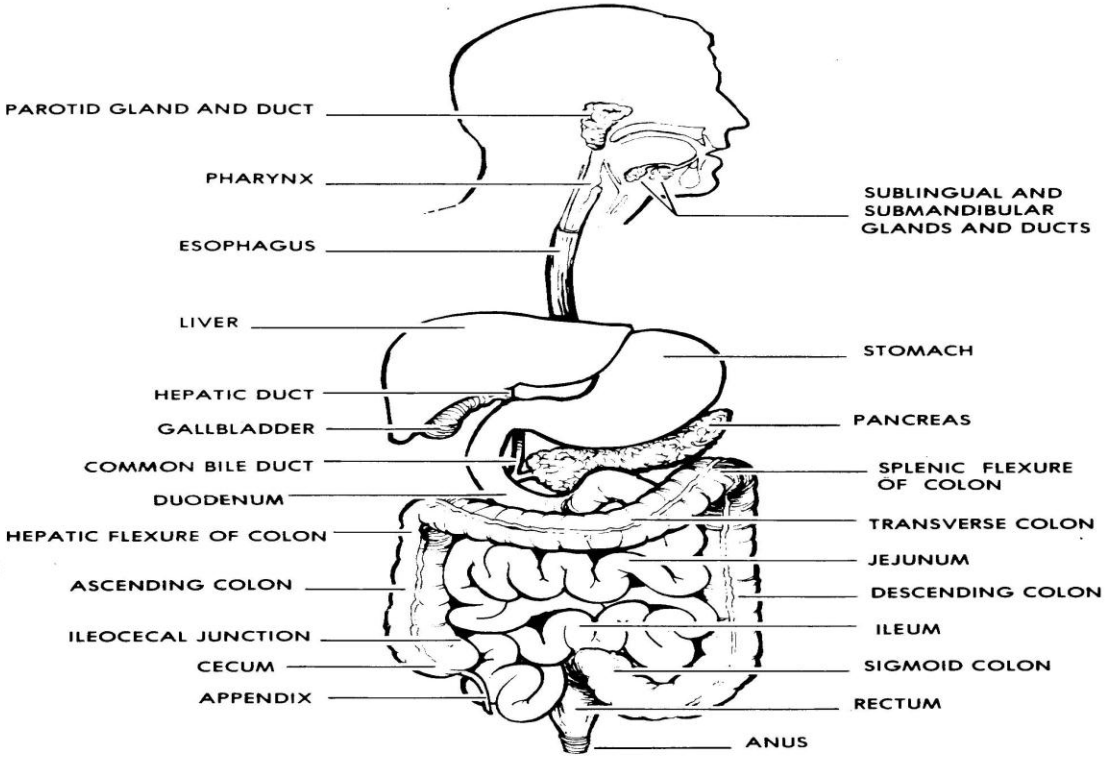
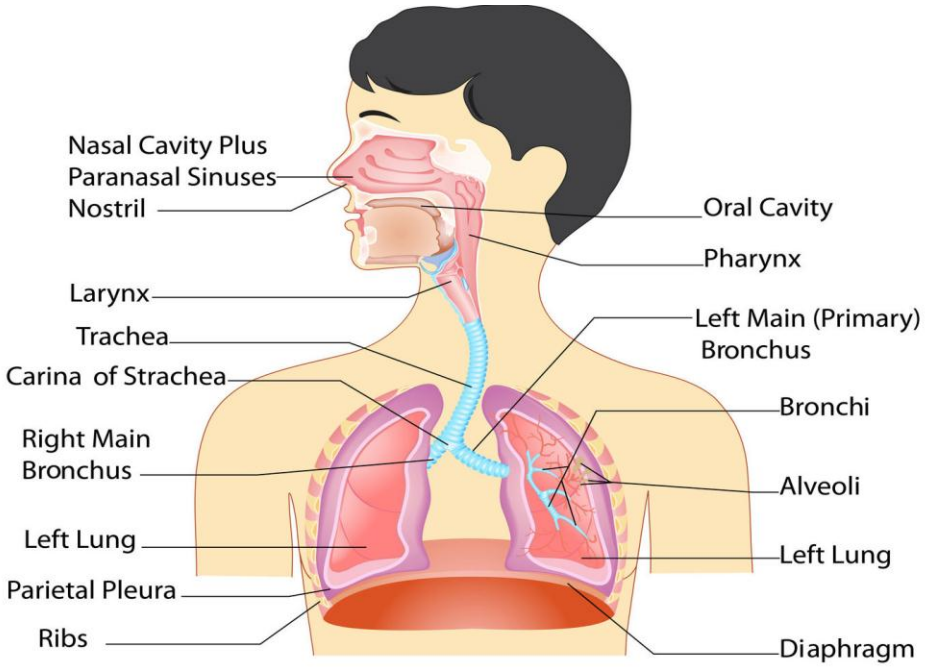


Figure 1-1. The digestive system.

	b)	**Explain respiratory system with a suitable diagram.** **Ans:** **Respiratory system:** 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.  **Fig : Respiratory System**	**03 M** **03 M**
	c)	**Describe central nervous system with a neat diagram.** **Ans :** **Central nervous system:** The Central nervous system consists of brain present in the cranial cavity and spinal cord present in the vertebral column. **Brain:** The peripheral part of the brain is made of grey matter and the medulla of the brain is made of white matter. The brain and the spinal cord are completely surrounded by three meanings or membranes which lie between the skull and the brain. They are named as 1. The duramater 2. Piameter 3. Arachnoidmater. The brain is formed of cerebrum, the mid brain, the pons varolii, the medulla oblongata, the cerebellum. **Spinal cord:** It is an elongated and almost cylindrical part of the central nervous system. It is situated in the neural canal of the vertebra. Central nerves system (CNS) is related with sensory & motor activity. It enables a person to adjust with external environment. The function of CNS occurs according to the will power of person. It supplies nerves to skeletal muscles (motor nerves) & Sensory nerves carry impulses from senses organs to brain.	**03 M**

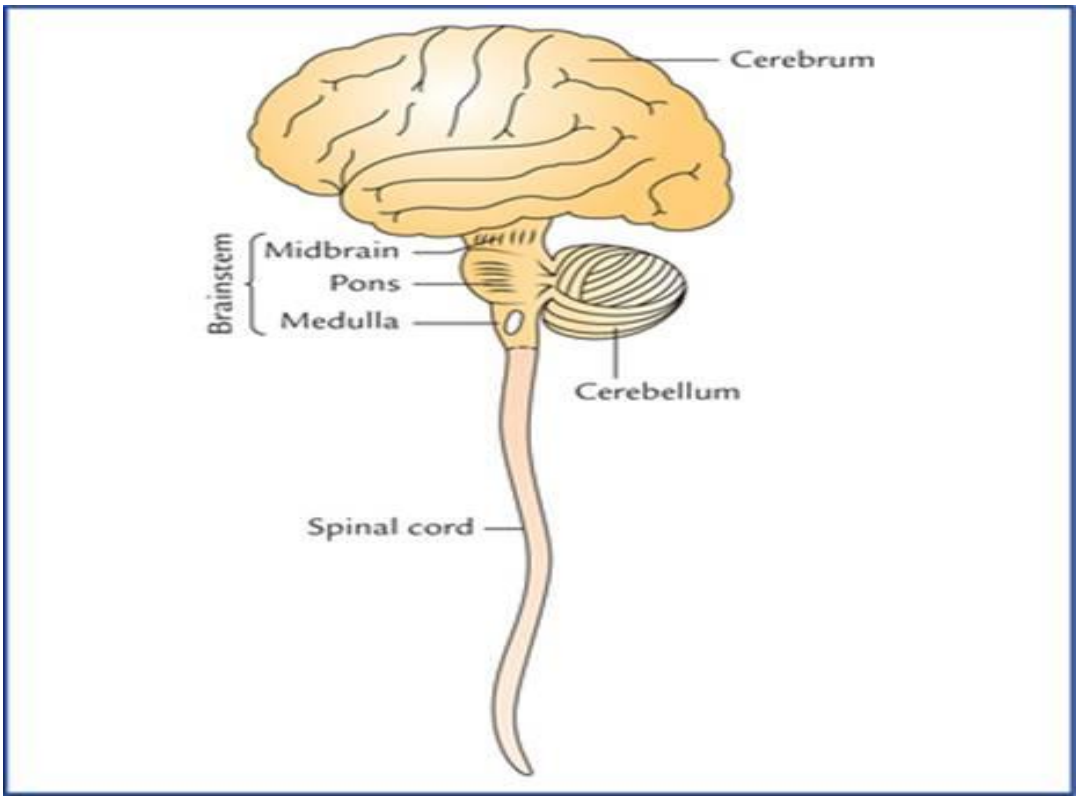


Fig : Central nerves system

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