



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
1	(a)	Attempt any EIGHT of the following Define: Anatomy and Physiology. Anatomy - It is the study of structure of the body & its individual parts & their relation to one another. Physiology - It is the study of the functions of various parts and how they are integrated to produce a coordinated action of the whole body.	8 x 2=16 1M 1M
	(b)	Define menstruation. Menstruation: This is the series of events occurring regularly in females every 26-30 days throughout the child bearing age.	2M
	(c)	Name types of bones according to size and shape. Depending upon shape and size, the bones are classified as: 1. Long bones: e.g. femur, tibia, fibula. 2. Short bones: e. g. carpal and tarsal bones. 3. Flat bones: e.g. sternum, scapula, ribs, bones of the skull. 4. Irregular bones. e.g. vertebrae and most bones of face. 5. Sesamoid bones: e.g. patella bone.	2M
	(d)	Define tissue. Name fundamental tissue. Tissue: Groups of cells which have the same physical characteristics and similar functions are termed as tissues. Fundamental tissues: 1.Epithelial tissue, 2.Connective tissue 3. Muscular tissue, 4.Nervous tissue.	1M 1M
	(e)	Name parts of brain. Parts of brain: 1.Cerebrum,	2M

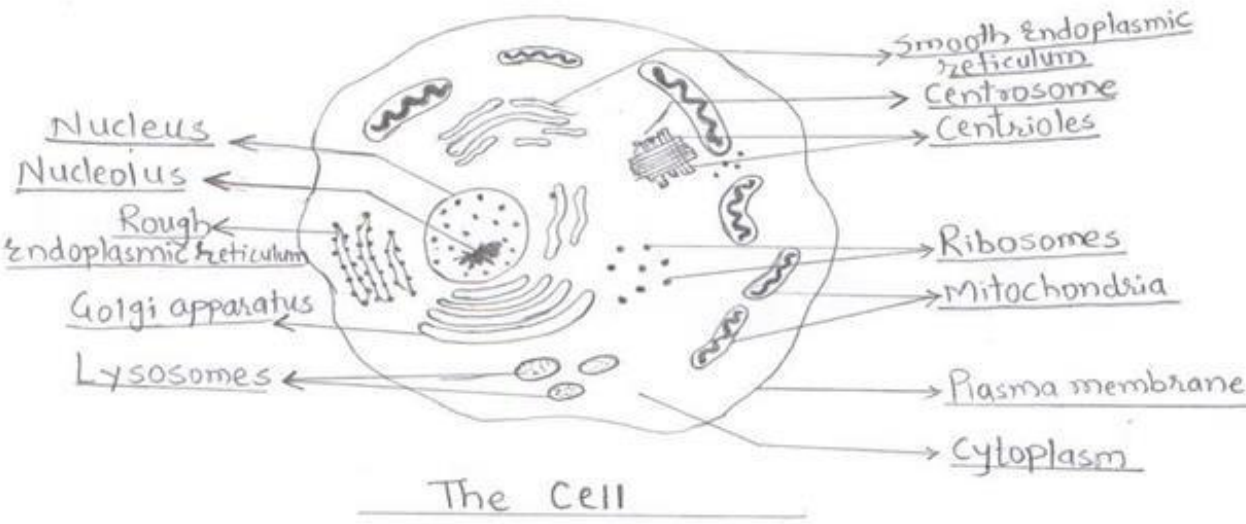


	<p>2.The brain stem consisting of mid brain, pons, and medulla oblongata 3. Cerebellum.</p> <p>(f) Give different types of W.B.C. WBCs are of two types based on the presence of granules in the cytoplasm as granulocytes and agranulocytes. They are further classified as -</p> <table border="0"><tr><td>Granulocytes</td><td>Agranulocytes</td></tr><tr><td>1. Neutrophils</td><td>1. Monocytes</td></tr><tr><td>2. Eosinophils</td><td>2. Lymphocytes</td></tr><tr><td>3. Basophils</td><td></td></tr></table>	Granulocytes	Agranulocytes	1. Neutrophils	1. Monocytes	2. Eosinophils	2. Lymphocytes	3. Basophils		2M
Granulocytes	Agranulocytes									
1. Neutrophils	1. Monocytes									
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3. Basophils										
	<p>(g) Define night blindness. Night blindness is a condition of the eyes in which vision is normal in daylight but abnormally poor at night or in a dim light due to deficiency of vitamin A.</p>	2M								
	<p>(h) Name organs of male reproductive system.</p> <ul style="list-style-type: none">• 2 testes and 2 epididymides in the scrotum• 2 deferent ducts (vas deferens)• 2 spermatic cords• 2 seminal vesicles• 2 ejaculatory ducts• 1 prostate gland• Urethra & penis	2M								
	<p>(i) Name types of muscular tissue. There are three types of muscular tissues: 1. Skeletal Muscle/ voluntary/ striated muscle 2. Smooth muscle/ involuntary/ nonstriated muscle 3. Cardiac Muscle</p>	2M								



(j)	<p>Name the bones of cranium.</p> <p>The bones of the cranium are:</p> <p>1 frontal bone, 2 parietal bones, 2 temporal bones, 1 occipital bone, 1 sphenoid bone and 1 ethmoid bone.</p>	2M
(k)	<p>Enlist sense organs of the body.</p> <p>There are five sense organs in the body. They are eye, ear, nose, tongue and skin.</p>	2M
(l)	<p>Define digestion.</p> <p>The conversion of complex food into simple form by mechanical action and chemical breakdown by enzymes so that it is easily absorbed in the blood is described as digestion.</p>	2M



Q. No.	Sub. Q. N.	Answer	Marking Scheme									
2	(a)	<p>Solve any FOUR of the following:</p> <p>Define cell. Draw a well labeled diagram of cell.</p> <p>Cell is the structural and functional unit of the human body.</p> <p>Diagram:</p> 	<p>4 x 3 =12M</p> <p>1M</p> <p>2M</p>									
	(b)	<p>What is structural and functional difference between artery and vein?</p> <table border="1" data-bbox="191 1633 1446 1969"> <thead> <tr> <th data-bbox="191 1633 272 1745">Sr. No.</th> <th data-bbox="272 1633 867 1745">Artery</th> <th data-bbox="867 1633 1446 1745">Vein</th> </tr> </thead> <tbody> <tr> <td data-bbox="191 1745 272 1856">1</td> <td data-bbox="272 1745 867 1856">Arteries are the blood vessels which carry the blood away from the heart.</td> <td data-bbox="867 1745 1446 1856">Veins are the blood vessels which bring the blood towards the heart.</td> </tr> <tr> <td data-bbox="191 1856 272 1969">2</td> <td data-bbox="272 1856 867 1969">All arteries except pulmonary artery carry oxygenated blood.</td> <td data-bbox="867 1856 1446 1969">veins except pulmonary veins bring deoxygenated blood.</td> </tr> </tbody> </table>	Sr. No.	Artery	Vein	1	Arteries are the blood vessels which carry the blood away from the heart.	Veins are the blood vessels which bring the blood towards the heart.	2	All arteries except pulmonary artery carry oxygenated blood.	veins except pulmonary veins bring deoxygenated blood.	<p>6 x 0.5 =3M</p>
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3	Arteries are thick walled. In artery tunica media is thick.	Veins are thin walled. In veins tunica media is thin.
4	Arteries are elastic	Veins are less elastic.
5	Lumen of the artery is smaller as compared to vein.	Lumen of the vein is larger as compared to artery.
6	Arteries are branched into arterioles.	Venules reunite to form veins.
7	They are reddish in colour	They are bluish in colour
8	They do not contain valves	They contain valves

(c) **Enlist hormones secreted by thyroid gland with their functions.**

Hormones secreted by Thyroid gland are Tri-iodothyronine(T3), Tetraiodothyronine/Thyroxine (T4) and Calcitonin

1M

Functions of T3 & T4:

1.5M

Most of body cells are targets for thyroid hormones.

These are essential for growth, development and metabolism.

These hormones:

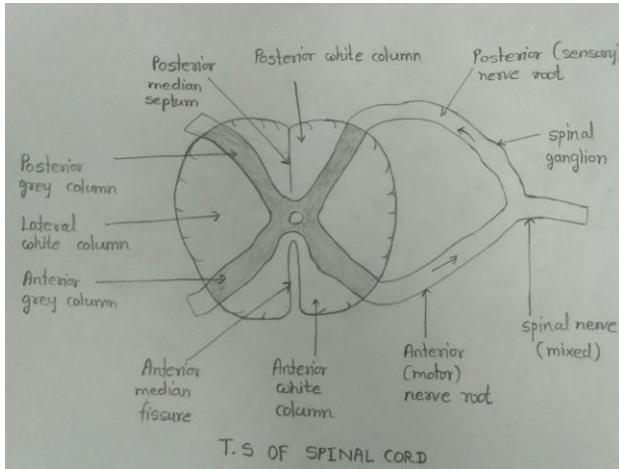
- Increase basal metabolic rate & heat production
- Regulating metabolism of carbohydrates, proteins & fats.
- They are essential for normal development of nervous & skeletal systems.
- Essential for normal reproductive functions.

Calcitonin: Calcitonin maintains blood calcium level

0.5M

- It acts on bone & kidneys to reduce blood calcium level when it is raised.
- It acts on bone cells promoting the storage of calcium in the bones.
- It inhibits calcium reabsorption by renal tubules.

(d) **Draw and label T.S. of spinal cord.**



3M

(e) **Write composition and functions of gastric juice.**

About 2 liters of gastric juice is secreted daily.

Composition - water, mineral salts, mucus, hydrochloric acid, intrinsic factor, inactive enzyme precursors: pepsinogens

1M

Functions of Gastric Juice:

2M

1. Water liquefies the food.
2. HCl acidifies the food & stops the action of salivary amylase.
3. HCl kills the microbes,
4. Pepsinogen is activated to pepsin by HCl, This digests protein to peptones and peptides.
5. Intrinsic factor helps in absorption of vit. B12 from small intestine.
6. Mucus prevents mechanical injury to the stomach wall.

(f) **Define anaemia. Mention its types.**

Anaemia: In anaemia, there is not enough haemoglobin available to carry sufficient O₂ from lungs to the tissues. i.e. a condition in which the oxygen carrying capacity of the blood is reduced.

1M



3

Classification based on the cause

- 1 Impaired erythrocyte production –
 - iron deficiency anaemia – due to deficiency of iron
 - megaloblastic anaemia – Due to deficiency of Vitamin B₁₂ or folic acid
 - hypo plastic/ aplastic anaemia – Due to reduced/ no bone marrow function
- 2 Increased erythrocyte loss-
 - Haemolytic anaemia – May be either congenital or acquired.
 - Congenital includes sickle cell anaemia or Thalassemia-Major & Minor
 - hemorrhagic anaemia (acquired) - Due to blood loss

Solve any FOUR of the following:

(a) **Differentiate between voluntary muscle and involuntary muscle.**

Sr. No.	Voluntary muscle	Involuntary muscle
1.	It is also known as striated Muscle due to presence of striations	Non- striated muscle as striations are absent
2	The fibres (cell) are cylindrical and has many nuclei	The cells are spindle shaped with only one central nucleus
3	They are under the control of our will. (voluntary)	They are not under the control of our will.(involuntary)
4	The fibrous tissue enclosing the whole muscle extends beyond the fibres to become the tendon which attaches the muscle to the bone or skin.	Bundles of fibres form sheets of muscle.

2M

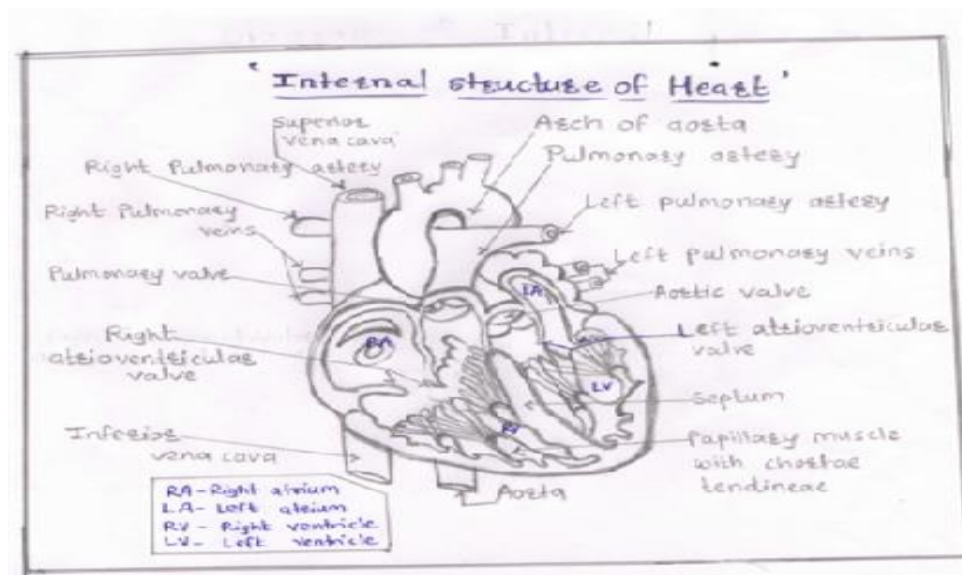
4 x 3
=12M

6 x 0.5
=3M

5	There is distinct sarcolemma	No distinct sarcolemma
6	Present in movable part under control of will like tongue, arms or hands, legs, etc.	Present in parts not under control of will like lower part of oesophagus, stomach, intestine, etc.

3M

(b) Draw a well labelled diagram for internal structure of heart.



(c) Write functions of skin.

6 x 0.5

Functions of skin-

=3M

- 1. Protection** - It forms the water proof layer & protects the inner delicate structures. It acts as the barrier against the invasion of the microbes, chemicals & dehydration. The melanin pigment protects against the harmful UV rays.
- 2. Regulation of body temperature-** The temperature is constant at 36.8° C. When the metabolic rate of the body increases, the body temperature increases & vice versa. To ensure constant body temp., a balance between heat production & heat loss is



maintained by the skin.

3. **Formation of vitamin D** - 7-dehydroxycholesterol is present in the skin. The UV light from the sun converts it to vitamin D.
4. **Sensation** – It contains nerve endings of many sensory nerves which act as organ of sensation of touch, temp., pressure and pain.
5. **Absorption**- Some drugs & chemicals are absorbed through the skin.
6. **Excretion**- Skin is a minor excretory organ & excretes NaCl, urea & substances like garlic.

(d)

Mention functions of lymphatic system.

Functions of lymphatic system-

1. **Tissue drainage:** Every day, around 21 litres of fluid from plasma, carrying dissolved substances and some plasma protein, escape from the arterial end of the capillaries and into the tissues. Most of this fluid is returned directly to the bloodstream via the capillary at its venous end, but the excess, about 3-4 litres of fluid, is drained away by the lymphatic vessels.
2. **Absorption in the small intestine:** Fat and fat-soluble materials, e.g. the fat-soluble vitamins are absorbed into the central lacteals (lymphatic vessels) of the villi.
3. **Immunity:** The lymphatic organs are concerned with the production and maturation of lymphocytes, the white blood cells responsible for immunity.

OR

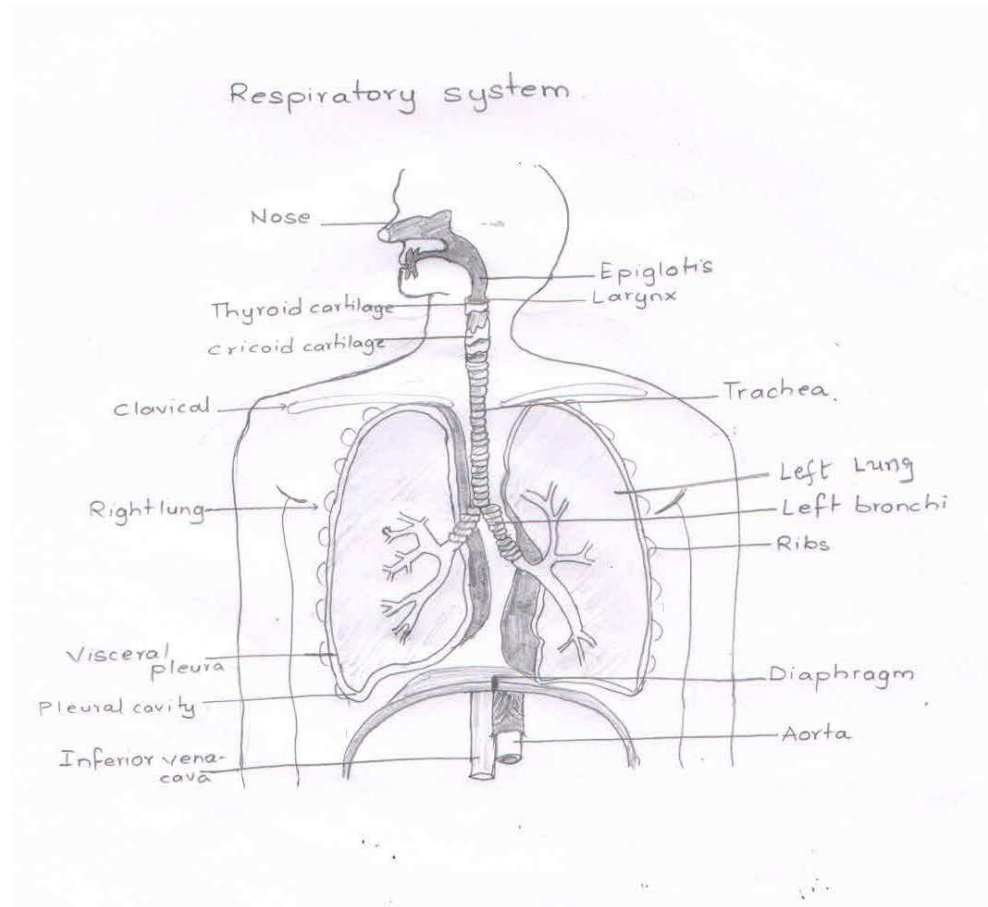
- 1) It collects and returns tissue fluids from the intercellular spaces to the blood.
- 2) It plays an important role in returning plasma proteins to the blood.
- 3) Lymph node multiplies & transport lymphocytes to the circulatory system.
- 4) It absorbs and transport fatty acids and fats from the digestive system by the lacteals.

3M



	<p>5) Lymph nodes play an important role in defence mechanism by way of filtration of lymph & trapping microorganism.(phagocytosis)</p> <p>6) Spleen can act as reservoir of blood.</p> <p>(e) Define puberty. State physical and physiological changes that occurs at puberty in female.</p> <p>Puberty- Puberty is defined as age at which the internal reproductive organs reach maturity.</p> <p>Physical & physiological changes at puberty are -</p> <ol style="list-style-type: none">1. The uterus, uterine tubes & ovaries reach maturity.2. The menstrual cycle & ovulation begins.3. The breasts develop & enlarge.4. Pubic & axillary hair begins to grow.5. Increase in rate of growth of height & widening of pelvis.6. Increase in amount of fat deposited in subcutaneous tissue, especially at the hips & breasts. <p>(f) Explain structure and functions of lungs.</p> <p>Structure of lungs:</p> <p>There are two lungs, one lying on each side of the midline in the thoracic cavity. They are cone-shaped and have an apex, a base, costal surface and medial surface.</p> <p>The right lung is divided into three distinct lobes: superior, middle and inferior. The left lung is smaller & is divided into only two lobes: superior and inferior. The division between the lobes is called fissures. Each lobe is composed of lobules. Each lobe contains small bronchial tubes.</p> <p>These tubes divide, sub-divide and ends finally in air sacs i.e. alveoli. Each lung is surrounded by a double serous membrane called pleura composed of outer parietal and inner visceral layers.</p> <p>Between the pleural layers, there is pleural (serous) fluid.</p> <p>Functions of lungs:</p> <ol style="list-style-type: none">1. Breathing (pulmonary ventilation)/ Exchange of gases O₂ & CO₂	<p>1M</p> <p>2M</p> <p>2M</p> <p>1M</p>
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Diagram of respiratory system:



2M

(c) Write functions of kidney.

6 x 0.5

Functions of kidney are: 1. Formation of urine

=3M

2. Maintenance of water balance and urine output

3. Maintenance of electrolyte balance (sodium-potassium

balance and calcium balance)

4. Maintenance of pH balance (Acid-base balance)

5. Maintenance of blood pressure.

6. Formation of erythropoietin hormone for erythropoiesis.



<p>(d)</p>	<p>Define endocrine gland. Name the endocrine glands of human body.</p> <p>Endocrine glands are ductless glands which release their secretions (hormones) directly into the blood.</p> <p>Endocrine glands: Pituitary gland, thyroid gland, parathyroid glands, pancreas (islets of Langerhans), adrenal glands, pineal gland, testes in male and ovaries in female.</p>	<p>1M</p> <p>2M</p>
<p>(e)</p>	<p>Enlist cranial nerves.</p> <p>I Olfactory - sensory</p> <p>II Optic - sensory</p> <p>III Oculomotor - Motor</p> <p>IV Trochlear - Motor</p> <p>V Trigeminal - Mixed</p> <p>VI Abducens - Motor</p> <p>VII Facial - Mixed</p> <p>VIII Auditory (vestibulocochlear) -sensory</p> <p>IX Glossopharyngeal- Mixed</p> <p>X Vagus - Mixed</p> <p>XI Accessory - Motor</p> <p>XII Hypoglossal - Motor</p>	<p>3M</p>
<p>(f)</p>	<p>Describe structure and functions of large intestine.</p> <p>Structure of large intestine: The large intestine is about 1.5 meters long having 6 parts i.e.</p>	<p>1M</p>



caecum with vermiform appendix, ascending colon, transverse colon, descending colon, sigmoid colon, rectum and anal canal. It has four coats: 1. Serosa, (lacking in the anal canal). 2. Muscular coat consisting of longitudinal and circular muscles. 3. Submucosa layer contains lymphoid tissue provide non-specific defence. 4. Mucosal layer contains mucus-secreting goblet cells.

Functions of large intestine

2M

1) **Absorption:** In the large intestine absorption of water continues until the familiar semisolid consistency of faeces is achieved. Mineral salts, vitamins and some drugs are absorbed into the blood capillaries from the large intestine.

2) **Microbial activity:** Bacteria present in colon are called as intestinal bacterial flora involved in production of vitamins like vitamin K and folic acid.

3) **Mass movement:** Peristalsis is absent. At regular intervals, the contents move due to wave of contraction known as mass movement.

4) **Defaecation:** Formation and expulsion of faeces from the body is one of the important functions of large intestine. This is called as defaecation. Lubrication Mucus secreted by goblet cells act as lubricant and ensures sufficient bulky contents of the large intestine to stimulate defaecation.

5

Solve any FOUR of the following

4 x 3
=12M

(a)

Define term (any two)

1.5 x

i) Cardiac output

2M

Cardiac output is the amount of blood ejected from the heart each minute.

=3M

Cardiac output = stroke volume x heart rate

i.e. 5040 ml/min



ii) Hypertension

The condition of blood pressure more than 140/90 mmHg termed as hypertension.

iii) Congestive cardiac failure

Congestive cardiac failure is also known as right ventricular failure.

In this, right ventricle fails to contract and empty itself completely. Due to this, the right atrium is unable to empty the blood into the right ventricle. This results in congestion of the venous system.

(b)

Give composition and functions of cerebrospinal fluid.

Composition of CSF: Water, mineral salts, glucose, plasma proteins: small amounts of albumin and globulin, creatinine, urea in small amounts, and few leukocytes.

Functions:

- It supports and protects the brain and spinal cord.
- It maintains a uniform pressure around these delicate structures.
- It acts as a cushion and shock absorber between the brain & the skull.
- It keeps the brain and spinal cord moist and there may be interchange of substances between CSF and nerve cells, such as nutrients and waste products.

(c)

Write the structure and functions of ovary.

Structure – The ovaries are 2.5 to 3.5 cm long, 2 cm wide & 1 cm thick

Microscopic structure-

Germinal epithelium – A layer of simple epithelium that covers the surface of ovary & is continuous with mesothelium that covers mesovarium

Tunica albuginea – It is just below germinal epithelium. It is a capsule of collagenous

1M

2M

1.5 M



connective tissue

Stroma – composed of outer cortex & is surrounded by loose layer medulla. The cortex contains ovarian follicle

Ovarian follicle – It contains oocytes

Graafian follicle – Large fluid filled follicle also contain immature ovum

Corpus luteum – Glandular body develops from ovarian follicle.

Functions –

- 1) Production of Ova – During ovulation, matured graafian follicle ruptures and liberates ova. When graafian follicle ruptures, it forms corpus luteum.
- 2) Production of estrogen
- 3) Production of progesterone.

1.5 M

(d) **What is auditory ossicle? Explain its structure.**

Auditory ossicles are three very small bones present in tympanic cavity of the ear. Malleus (hammer-shaped), Incus (anvil-shaped) and Stapes (stirrup-shaped).

1M

Structure

2M

Malleus – This is the lateral hammer shape bone. The handle is in contact with the tympanic membrane and the hand forms a movable joint with the incus.

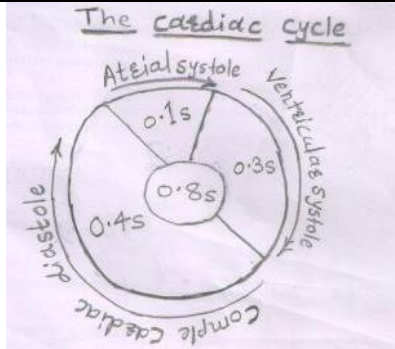
Incus – This is the middle anvil shaped bone. Its body articulates with the malleus, the long process with the stapes and it is stabilized by the short process, fixed by fibrous tissue to the posterior wall of the tympanic cavity.

Stapes – This is the medial stirrup shape bone. It's head articulates with the incus and its foot plate fits into the oval window.

The three ossicles are held in position by fine ligaments.



6.	(e)	Describe digestion of carbohydrates. Mouth - Salivary amylase changes cooked starches to disaccharides Small intestine - Pancreatic amylase changes cooked & uncooked starches to disaccharides. Sucrase, Maltase, Lactase change disaccharides to monosaccharides (mainly glucose)	3M
	(f)	Define any two of the following: i) Vital capacity This is the maximum volume of air which can be moved into and out of the lungs. OR It is the volume of air that passes into and out of the lungs by the most forcible inspiration and expiration (3 - 5 litres) ii) Tidal volume It is the volume of air moved in & out of lungs during each cycle of quiet (normal) breathing. (500 ml). iii) Residual volume This is the amount of air which remains behind in the lungs after forced expiration. (1000-1200 ml)	1.5x2 =3M
	(a)	Solve any FOUR of the following: Define cardiac cycle. Write about its different events.	4x4 =16M
		Cardiac cycle: The events which occur in the heart during the circulation of blood during each heart beat is called cardiac cycle OR The series of events during one heart beat is known as cardiac cycle.	1M



3M

Events in cardiac cycle:

- (i) Atrial systole (0.1 sec)
- (ii) Ventricular systole (0.3 sec)
- (iii) Complete cardiac diastole (0.4 sec) Total 0.8 sec

Description of cardiac cycle

The superior & inferior vena cava transports the deoxygenated blood into right atrium. At the same time four pulmonary veins transport oxygenated blood into the left atrium. The heart action starts in the special cells of myocardium called SA node or sinoatrial node. It is situated near the opening of superior vena cava in the right atrium. These impulses from the SA node spreads over the atria, atria contracts, the AV valves open and & blood flows to ventricles.

(Atrial systole-0.1 sec)

When the wave of contraction reaches AV node, it is stimulated & emits impulses which spread over AV bundle, bundle branches & Purkinje fibres resulting in contraction of ventricles pumping the blood into pulmonary artery & the aorta. (ventricular systole 0.3 sec). After the contraction of the ventricles there is complete cardiac diastole (0.4 sec) when both atria & ventricles relax. After this the next cycle begins.

(b) State functions of liver.

- 1. Secretion of bile: Bile salts are helpful in digestion and absorption of fats by its emulsification.
- 2. Glycogenic function: The hepatic cells by the action of enzymes convert glucose into

8x0.5
=4M



glycogen and it is then stored in the liver.

3. Formation of urea: Hepatic cells by the action of the enzyme cause deamination of amino acid, i.e. amine group is set free which forms urea.

4. Metabolism of fat: Whenever energy is needed, the saturated stored fat is converted to a form in which it can be used to provide energy.

5. Formation of RBCs in foetal life.

6. Destruction of RBCs forming bile pigments and iron.

7. Formation of plasma protein.

8. Formation of heparin, a natural anticoagulant in the blood.

9. Storage of iron and vitamin B12 & fat soluble vitamins A,D,E,K

10. Maintenance of body temperature: As a number of chemical reactions occur in the liver, heat is generated which is helpful in maintaining body temp.

11. Excretion of toxic substances: The toxic substances entering the body through alimentary canal are destroyed in liver.

OR

I. Carbohydrate metabolism: It helps in maintaining plasma glucose level with the help of insulin & glucagon.

II. Fat metabolism: Stored fat can be converted to a form in which it can be used by the tissue to provide energy.

III. Protein metabolism: Deamination of amino acids.-removes nitrogenous portion from amino acid not required for formation of new protein. Urea is formed from the nitrogenous portion which is excreted in urine. Break down of nucleic acids to form uric acid which is excreted in urine. Transamination: Removes the nitrogenous portion of amino acid & attaches it to carbohydrate molecule forming new non-essential amino acid.

IV. Synthesis of plasma protein & most blood clotting factors from amino acid.

V. Breakdown of RBCs & defence against microbes. This is carried out by Kupffer cells.

VI. Detoxification of drugs & noxious sub.

VII. Inactivation of hormones



VIII. Production of heat

IX. Secretion of bile

X. Storage of glycogen, iron, copper, & fat soluble vitamin-A, D, E, K, water soluble vitamin like vit. B12

(c)

Define clotting of blood. Write its mechanism.

When the blood vessel ruptures, in a few minutes blood loses its fluidity and sets into a semisolid mass called clot. This process is called as clotting of blood.

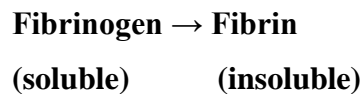
1M

Mechanism - Whenever there is damage to the blood vessel, there is formation of rough surface. When blood platelets come in contact with this surface, they get injured and release the substance called thromboplastin. In the presence of thromboplastin & calcium the inactive plasma protein prothrombin is converted into thrombin. This thrombin helps conversion of plasma protein fibrinogen to fibrin. The fibrin is insoluble & it forms threads. The threads of fibrin form the net, in this net blood cells are entangled. This mass forms a blood clot. This mechanism involves many blood clotting factors.

3M



Thrombin acts on



Fibrin + Blood Cells → Clot





(d)	Differentiate between sympathetic nervous system and parasympathetic nervous system.		4M	
	Sr. No.	Sympathetic nervous system		Parasympathetic nervous system
	1	This system enables the individual to adjust to exciting and stressful conditions (fight or flight)		This system acts as a peacemaker for the body allowing restoration processes to occur quietly peacefully.
	2	It is also called thoraco lumbar outflow.		It is also called cranio sacral outflow.
	3	Catabolic in nature.		Anabolic in nature.
	4	The preganglionic nerve fibre is short while the post ganglionic fibre which ends in effector organ is long.		The preganglionic nerve fibre is long while the post ganglionic fibre is short.
	5	The post ganglionic nerve fibre secretes neurotransmitter called adrenaline or noradrenaline		The post ganglionic nerve fibre secretes neurotransmitter called acetylcholine .
	6	It is also known as called adrenergic nervous system		It is also known as called cholinergic nervous system
7	Effects of sympathetic stimulation on any of the organs e.g.on heart, eye, bronchi, etc	Effects of parasympathetic stimulation on any of the organs e.g. on heart, eye, bronchi, etc		



(e) Name hormones produced by anterior lobe of pituitary gland with functions.

4M

Hormone	Functions
Growth hormone (GH)/somatotrophic hormone	It stimulates growth directly and in conjunction with other hormones.
Thyroid stimulating hormone (TSH)/ thyrotrophic hormone	It controls the growth and activity of thyroid gland
Adrenocorticotrophic hormone (ACTH)	It stimulates the cortex of adrenal glands to produce their hormones.
Gonadotrophic hormones i) Follicle stimulating hormone (FSH)	In females, it stimulate the ovarian follicle to produce mature ovum and secretion of estrogen by ovaries. In males, it stimulate the formation of spermatozoa in testis.
ii) Leutinizing hormone(LH)/ICSH in males	In females, it stimulates the corpus luteum to produce progesterone. In males, it stimulates interstitial cells to produce testosterone
Lactogenic hormone/ prolactin	It has direct effect on mammary glands & with help of other hormones it stimulates mammary glands to secrete milk.

(f) Explain process of urine formation.

4M

There are three processes of urine formation:

1. Glomerular filtration
2. Selective reabsorption
3. Tubular secretion.

Ultrafiltration/ glomerular filtration – Filtration takes place through the semi permeable walls of the glomerulus & glomerular capsule or Bowman’s capsule. Water and small



molecules pass through it. The afferent renal artery brings blood to the glomerulus and the efferent artery carries the blood away from it. As the diameter of afferent artery is more than the efferent artery, a hydrostatic pressure is generated in the glomerulus (55mm Hg). This pressure is opposed by osmotic (30 mmHg) and filtrate hydrostatic pressure in capsule (15mm Hg). The net filtration pressure is $55-(30+15) = 10$ mm of Hg.

All constituents of blood are filtered except blood cells and plasma proteins.

Selective reabsorption- This is the process by which composition and volume of filtrate are changed during its passage through the tubule. The constituents required by the body are reabsorbed. Components like glucose, vitamins, amino acids get completely re- absorbed into the blood. These are called high threshold substances. Low threshold substances like urea, uric acid are absorbed slightly. Some substances like creatinine are not reabsorbed at all.

Tubular secretion- Substances not required & foreign materials (non threshold substances) e.g.- drugs like penicillin may not be cleared in filtration. Such substances are cleared by secretion into convoluted tubules and excreted from body in urine.