11th STD.	PUBLIC EXAM - MARCH 2025 PART - III	Reg. No.
Time Allowed : 3.00 Hours]	**BIOLOGY** (with Answers)	[Maximum Marks : 70

Instructions: (1) Check the question paper for fairness of printing. If there is any lack of fairness, inform the Hall Supervisor immediately.

(2) Use **Blue** or **Black** ink to write and underline and pencil to draw diagrams.

PART - II

(BIO - ZOOLOGY) (Marks : 35)

SECTION - 1

Note : (i) Answer **all** the questions. **(8 × 1 = 8)**

(ii) Choose the most appropriate answer from the given **four** alternatives and write the option code and the corresponding answer.

1. CO_2 is transported through blood to lungs as :

(a) Carbamino haemoglobin (b) Carbonic acid

(c) Carboxy haemoglobin (d) Oxyhaemoglobin

2. Find out the wrongly matched pair.

(a) Cytoplasm - Sarcoplasm (b) Cell - Myofibril

(c) Endoplasmic reticulum - Sarcoplasmic reticulum

(d) Plasma membrane - Neurilemma

3. Why is the velocity of blood flow the lowest in the capillaries?

(a) The total surface area of the capillaries is larger than the total surface area of the arterioles.

(b) The systemic capillaries are supplied by the left ventricle, which has a lower cardiac output than the right ventricle.

(c) The capillary walls are not thin enough to allow oxygen to exchange with the cells.

(d) Capillaries are far from the heart and blood flow slows as distance from the heart increases.

4. All of the following are associated with the myeline sheath except :

(a) Increased energy output for nerve impulse conduction

(b) Faster conduction of Nerve impulses

(c) Saltatory conduction of action potential

(d) Nodes of Ranvier forming gaps along the axon

5. Choose the correctly matched pair.
   (a) Dual purpose - White Plymouth rock (b)Egg layers - Brahma
   (c) Ornamental breeds - Silkie (d)Broiler types - Leghorn
6. Which one of the connective tissue is aptly called 'Tissue Fluid'?
   (a) Reticular Tissue (b) Areolar Tissue
   (c) Dense Regular Tissue (d) Adipose Tissue
7. The hormone which helps in the reabsorption of water in kidney tubules is :
   (a) Antidiuretic hormone (b) Cholecystokinin
   (c) Pancreozymin (d) Angiotensin II
8. Which one of the following characteristic feature is not found in Mammals?
   (a) Pneumatic bones (b) Thecodont teeth
   (c) Metanephric kidney (d)Mammary glands

Section - 2

Note : Answer **any four** questions. **(4 × 2 = 8)**

9. What is the role of Charles Darwin in relation to concept of species?
10. List any two features that characterise bony fishes.
11. How do earthworms breathe?
12. Define Vital Capacity.
13. In which segment of the nephron most of the reabsorption of substances takes place?
14. List out the names of any four Steroid hormones.

Section - 3

Note: Answer **any three** questions. Question No. **19** is **Compulsory.** **(3 × 3 = 9)**

15. Mention the functions of air bladder in fishes.
16. In Herbivorous animal both Caecum and Vermiform appendix are larger in size. Why?
17. Give the economic importance of Silk.
18. List out any three functions of adrenalin hormone.
19. Write any three types of Synovial joints with examples.

Section - 4

Note: Answer **all** the questions **(2 × 5 = 10)**

20. (a) Draw a neat labelled diagram of the Digestive system of frog. **(OR)**
    (b) Draw Flow Chart of Blood Coagulation in an injured Blood Vessel.
21. (a) Explain the Refractive errors of eye such as Myopia, Hypermetropia and write the corrective measures with diagram. **(OR)**
    (b) What are the Nutritive values of fishes?

Answers

Section - 1

1. (a) Carbamino haemoglobin

2. (d) Plasma membrane - Neurilemma

3. (a) The total surface area of the capillaries is larger than the total surface area of the arterioles.

4. (a) Increased energy output for nerve impulse conduction

5. (c) Ornamental breeds - Silkie

6. (b) Areolar Tissue

7. (a) Antidiuretic hormone

8. (a) Pneumatic bones

Section - 2

9. 1. Charles Darwin visited the Galapagos Islands as a naturalist on a five year voyage around South America. He found 13 types of "Mocking birds" on the same island but in different habitats.

2. He brought back the different types and studied them. He found that only the beak pattern and usage was different in these different varieties.

3. Hence Darwin gets this credit of attempting to explain how species evolved and role of Natural selection. The birds are referred to as Darwin's finches. In 1859 Charles Darwin in his book Origin of Species explains the evolutionary connection of species by the process of natural selection.

10. Characteristics of bony fishes:

(i) Their endoskeleton is bony. (ii) They have swim bladder.

11. 1. The earthworm has no special respiratory organs like lungs or gills. Respiration takes place through the body wall.

2. The outer surface of the skin is richly supplied with blood capillaries which aid in the diffusion of gases.

3. Oxygen diffuses through the skin into the blood while carbon dioxide from the blood diffuses out.

4. The skin is kept moist by mucous and coelomic fluid and facilitates exchange of gases.

12. Vital capacity (VC) the maximum volume of air that can be moved out during a single breath following a maximal inspiration. A person first inspires maximally then expires maximally. VC = ERV + TV + IRV

13. About 70% of the reabsorption takes place in the proximal convoluted tubules of the nephron.

14. (i) Aldosterone (ii) Oestrogen

(iii) Progesterone (iv) Testosterone

Section - 3

15. In fishes air bladder regulates buoyancy and helps them to float in water. If air bladders are absent, the animals need to swim constantly to avoid sinking.

16. Both caecum and vermiform appendix are large in herbivorous animal and act as an important site for cellulose digestion with the help of symbiotic bacteria. The colon is divided into four regions – an ascending, a transverse, a descending part and a sigmoid colon.

17. Uses of silk are as follows :

(i) Silk fibers are utilized in preparing silk clothes. Silk fibers are now combined with other natural or synthetic fibers to manufacture clothes like Teri-Silk, Cot-Silk etc.

(ii) Silk is used in industries and for military purposes.

(iii) It is used in the manufacture of fishing fibers, parachutes, cartridge bags, insulation coils for telephone, wireless receivers, tyres of racing cars, filter fibres, in medical dressings and as suture materials.

18. Functions of adrenalin :

(i) The adrenal medulla secretes the hormones adrenalin (epinephrine) and noradrenalin (norepinephrine) and are referred as "3F hormone" (fight, flight and fright hormone).

(ii) Adrenalin increases liver glycogen breakdown into glucose and increases the release of fatty acids from fat cells.

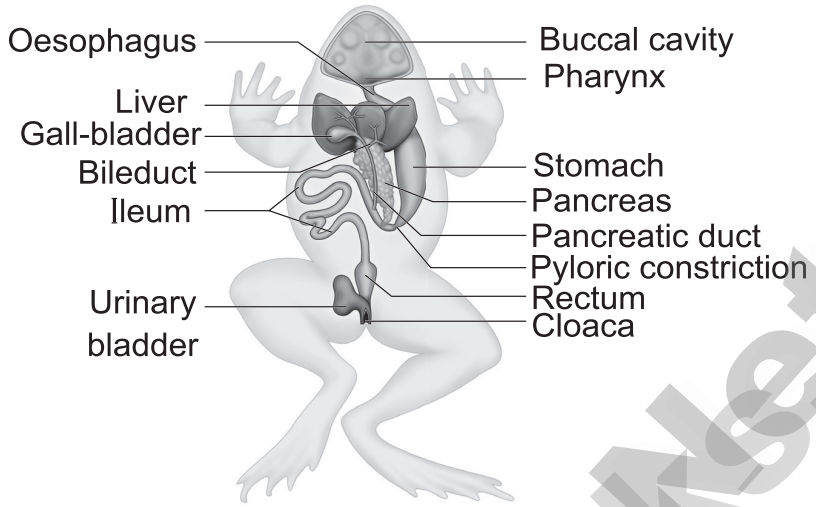
(iii) During emergency it increases heart beat rate and blood pressure.

19.

Pivot joint	between atlas and axis
Plane / gliding joint	between the carpals
Saddle joint	between the first carpal and metacarpal
Ball and socket joint	between humerus and pectoral girdle
Hinge joint	knee joint
Condyloid or Angular or Ellipsoid	between radius and carpal

Section - 4

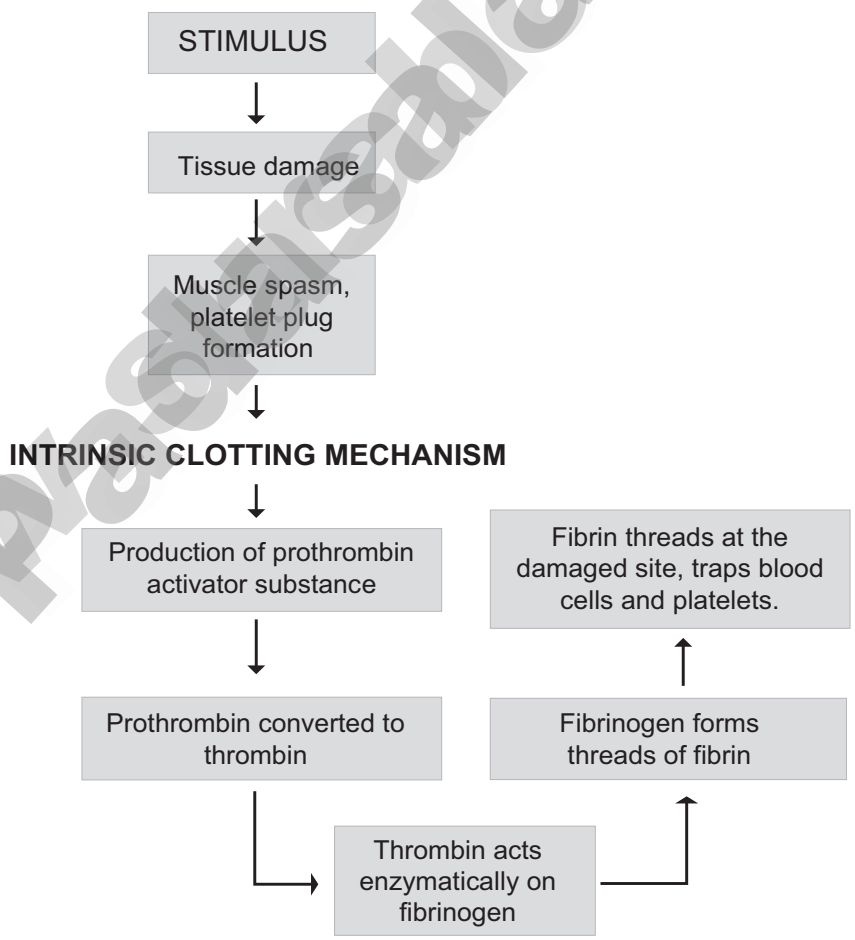
20. (a)



Digestive system of frog

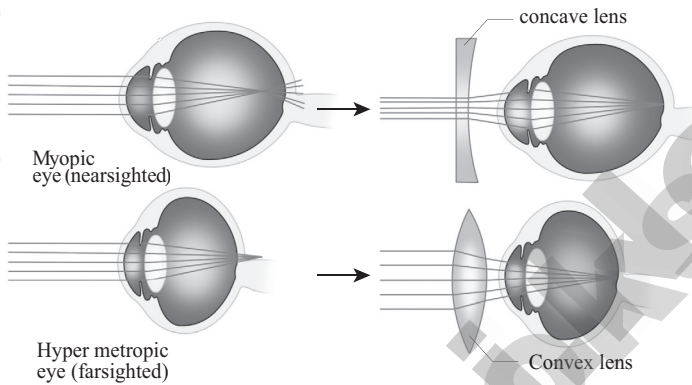
(OR)

(b)



21. (a) Refractive errors of eye :

1. **Myopia (near sightedness):** The affected person can see the nearby objects but not the distant objects. This condition may result due to an elongated eyeball or thickened lens; so that the image of distant object is formed in front of the yellow spot. This error can be corrected using concave lens that diverge the entering light rays and focuses it on the retina.



Refractive errors of the eye

2. **Hypermetropia (long sightedness):** The affected person can see only the distant objects clearly but not the objects nearby. This condition results due to a shortened eyeball and thin lens; so the image of closest object is converged behind the retina. This defect can be overcome by using convex lens that converge the entering light rays on the retina.

(OR)

(b) Nutritive values of fishes :

1. Fishes farm a rich source of protein food and provide a good staple food to tide over the nutritional needs of man.
2. Fish species such as sardines, mackerel, tuna, herrings have high amino acids concentrations particularly histidine which is responsible for the meaty flavor of the flesh.
3. It is rich in fat such as omega 3 fatty acids. Minerals such as calcium, magnesium, phosphorus, potassium, iron, manganese, iodine and copper.
4. **Fish oil:** Fish liver oil is derived from the liver which is rich in vitamin A and D, whereas fish body oil has high content of iodine, not suitable for human consumption, but is used in the manufacture of laundry soaps, paints and cosmetics.
5. Fish meal is prepared from fish waste after extracting oil from the fish. The dried wastes are used to prepare food for pig, poultry and cattle. The wastes obtained during the preparation of fish meal are widely used as manure.

11th STD.

PUBLIC EXAM - MARCH 2025

PART - III

Reg. No.

Time Allowed : 3.00 Hours] **ZOOLOGY (with Answers)** [Maximum Marks : 70

Instructions: (1) Check the question paper for fairness of printing. If there is any lack of fairness, inform the Hall Supervisor immediately.

(2) Use **Blue** or **Black** ink to write and underline and pencil to draw diagrams.

PART - I

Note : (i) Answer **all** the questions: **(15 × 1 = 15)**

(ii) Choose the most appropriate answer from the given **four** alternatives and write the option code and the corresponding answer.

1. What will happen if the stretch receptors of the urinary bladder wall are totally removed?

(a) There will be micturition (b) Continuous micturition

(c) Urine will not collect in the bladder (d) Urine will continue to collect normally in the bladder

2. A group of organisms having similar traits of a rank is _____ .

(a) Genus (b) Species (c) Family (d) Taxon

3. Which one of the following is not related to Vermiculture?

(i) Maintains soil fertility (ii)Breakdown of inorganic matter

(iii) Gives porosity, aeration and moisture holding capacity

(iv) Degradation of non bio-degradable solid waste

(a) (ii) and (iv) are not correct (b) (i) and (ii) are correct

(c) (i) and (iii) are not correct (d) (iii) and (iv) are correct

4. Among the following, which part of the brain acts as the satiety centre?

(a) Hypothalamus (b) Thalamus (c) Hippocampus (d) Epithalamus

5. When the potential across the axon membrane is more negative than the normal resting potential, the neuron is said to be in a state of :

(a) Repolarization (b) Depolarization

(c) Hypopolarization (d) Hyperpolarization

6. Hyper secretion of growth hormone in children leads to :

(a) Grave's disease (b) Cretinism (c) Tetany (d) Gigantism

7. The tidal volume of a normal person is :

(a) 500 mL (b) 800 mL (c) 1100 - 1200mL (d) 1200 mL

8. Which part of the human brain is concerned with the regulation of body temperature?

(a) Medulla oblongata (b) Cerebellum

(c) Hypothalamus (d) Cerebrum

9. The pigment present in the muscle fibre to store oxygen is :

(a) Myosin (b) Myoglobin (c) Actin (d) Troponin

10. A person having both antigen A and antigen B on the surface RBCs belongs to Blood group :

(a) AB (b) A (c) O (d) B

11. Cydippid larva belongs to which Phylum?

(a) Porifera (b) Ctenophora (c) Platyhelminthes (d) Cnidaria

12. The main function of the cuboidal epithelium is :

(a) Protection (b) Secretion (c) Absorption (d) Both (b) and (c)

13. In small intestine active absorption occurs in case of :

(a) Amino acids (b) Na^+ (c) Glucose (d) All the above

14. Which creature can live for about a week without its head?

(a) Frog (b) Earthworm (c) Pigeon (d) Cockroach

15. Which one of the following statement is correct?

(a) Secretin and Rhodopsin are polypeptide hormones.

(b) Calcitonin and Thymosin are thyroid hormones.

(c) Cortisol and Aldosterone are steroid hormones.

(d) Pepsin and Prolactin are secreted in stomach.

PART - II

Note : Answer **any six** questions. Question No **24** is **Compulsory**. **(6 × 2 = 12)**

16. What is the nitrogenous waste produced by amphibian larvae and by the adult animal?

17. What is meant by Physiotherapy?

18. Name any four important functions of epithelial tissue.

19. Draw and label the parts of human Large intestine.

20. What are Flame cells?

21. Write any two significance of Glucometer.

22. Explain the functions of Alary muscles.

23. What is lymph?

24. What is composite fish farming?

PART - III

Note : Answer **any six** questions. Question No. **33** is **Compulsory.** **(6 × 3 = 18)**

25. Draw the different types of human WBC.

26. Which is called the Blind Spot? Why is it called so?

27. Write the rules of Nomenclature.

28. Differentiate between elastic fibres and elastic connective tissue.

29. List three features that characterise bony fishes.

30. Name the layers of Adrenal Cortex.

31. Define Cross breeding.

32. Write the clinical significance of sphygmomanometer.

33. Why do some people snore during sleep?

PART - IV

Note: Answer **all** the questions. **(5 × 5 = 25)**

34. (a) Differentiate between rod and cone cells. **(OR)**

(b) Differentiate hyperglycemia from hypoglycemia.

35. (a) Differentiate chordates and non-chordates. **(OR)**

(b) Explain the male reproductive system of frog.

36. (a) What are the functions of Liver? **(OR)**

(b) Explain in detail the steps involved in Respiration.

37. (a) What is the function of antidiuretic hormone (ADH)? Where is it produced and what stimuli increases or decreases its secretion? **(OR)**

(b) What are the benefits of regular exercise?

38. (a) Distinguish between arteries and veins. **(OR)**

(b) Draw a neat labelled diagram of the digestive system of cockroach.

Answers

PART - I

1. (b) Continuous micturition
2. (b) Species
3. (a) (ii) and (iv) are not correct
4. (a) Hypothalamus
5. (d) Hyperpolarization
6. (d) Gigantism
7. (a) 500 mL
8. (c) Hypothalamus
9. (b) Myoglobin
10. (a) AB
11. (b) Ctenophora
12. (d) Both (b) and (c)
13. (d) All the above
14. (d) Cockroach
15. (c) Cortisol and Aldoesterone are steroid hormones.

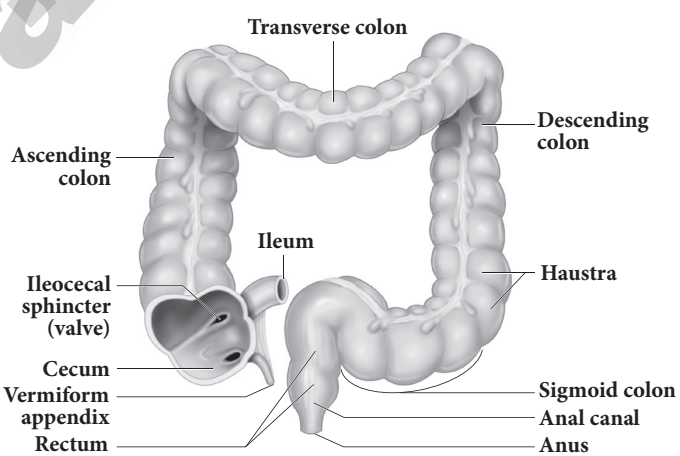
PART - II

16. (i) Nitrogenous waste produced by amphibian larvae is Ammonia. Since they are aquatic, ammonia diffuses into the water.
(ii) Nitrogenous waste produced by adult amphibian is urea since they are terrestrial. Further production of urea as excretory waste requires less water.

17. (i) Physiotherapy is the therapeutic exercise to make the limbs work near normally.
(ii) It is a rehabilitation profession with a presence in all health care centres.

18. The functions of epithelial tissues are :
(i) **Protection :** The compound epithelium is multilayered and gives protection to the underlying tissues against chemical and mechanical stresses.
(ii) **Absorption and Secretion:** The goblet cells found in the epithelial lining of the digestive tract in the stomach secrete the protective lubricating mucus. This epithelium helps in absorption and secretion.
(iii) **Filtration:** The squamous epithelium found in the glomeruli in the kidneys form a diffusion boundary and aids filtration.
(iv) **Sensory reception:** If the columnar cells bear cilia on their free surfaces they are called ciliated epithelium.

19.



Large intestine

20. Specialised excretory cells called flame cells are seen in Phylum platyhelminthes. These cells help in osmoregulation and excretion. They have flickering cilia or flagella for driving the absorbed excretory products.

21. (i) Handy and portable.
(ii) Immediate results, the results are displayed in approximately 40 seconds.

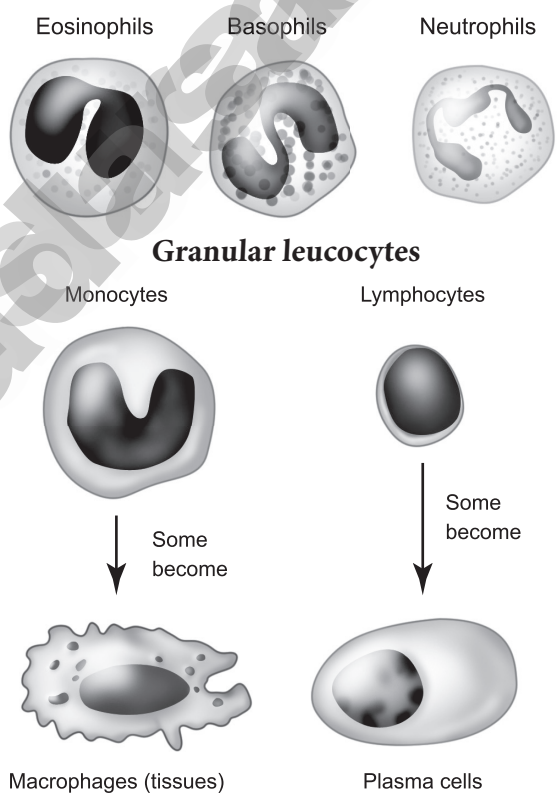
22. (i) In cockroach the heart consists of 13 chambers with ostia on either side.
(ii) The blood from the sinuses enters the heart through the ostia and is pumped anteriorly to sinuses again.
(iii) The triangular muscles that are responsible for blood circulation in the cockroach are called alary muscles (12 pairs).
(iv) One pair of these muscles is found in each segment on either side of the heart.

23. About 90% of fluid that leaks from capillaries eventually seeps back into the capillaries and the remaining 10% is collected and returned to blood system by means of a series of tubules known as lymph vessels or lymphatics. The fluid inside the lymphatics is called lymph.

24. **Composite fish farming :** Few selected fishes belonging to different species are stocked together in proper proportion in a pond. This mixed farming is termed composite fish farming or polyculture.

PART - III

25.



26. Retina is called the Blind Spot. The optic nerves and the retinal blood vessels enter the eye slightly below the posterior pole, which is devoid of photo receptors; hence this region is called blind spot.

27. Rules of Nomenclature :

(i) The scientific name should be italicized in printed form and if handwritten, it should be underlined separately.

(ii) The generic name's (Genus) first alphabet should be in uppercase.

(iii) The specific name (species) should be in lowercase.

(iv) The scientific names of any two organisms are not similar.

(v) The name or abbreviated name of the scientist who first publishes the scientific name may be written after the species name along with the year of publication.

(vi) If the species name is framed after any person's name the name of the species shall end with i, ii or are.

28. (i) **Elastic connective** tissue is a type of Dense connective tissue and contains a high proportion of elastic fibres. It allows recoil of tissues following stretching. Eg: The wall of large arteries.

(ii) **Elastic Fibres** are the fibrous component of all types of dense connective tissues. The stretching property of elastic connective tissue is because of the presence of elastic fibres. The proportion of elastic fibres is less in Dense regular and Dense irregular connective tissues when compared to elastic connective tissue.

29. Bony fishes includes both marine and freshwater living with bony endoskeleton and spindle shaped body.

Characteristics of bony fishes:

(i) Their endoskeleton is bony. (ii) They have swim bladder.

(iii) Gills are covered by opercula. (iv) They are found in sea and fresh water.

30. (i) A pair of adrenal glands are located at the anterior end of the kidneys.

(ii) Anatomically the outer region is the cortex and the inner region is the medulla.

(iii) Histologically the adrenal cortex has three distinct zones, zona glomerulosa, zona fasciculata and zona reticularis.

(iv) Zona glomerulosa an outer thin layer constitutes about 15% of adrenal cortex, and secretes mineralocorticoids.

(v) Zona fasciculata, the middle widest layer constitutes about 75% of adrenal cortex and secretes glucocorticoids such as cortisol, corticosterone and trace amounts of adrenal androgen and oestrogen.

(vi) Zona reticularis, an inner zone of adrenal cortex constitute about 10% of adrenal cortex and secretes the adrenal androgen, trace amount of oestrogen and glucocorticoids.

31. Cross breeding :

(i) It is a method of Animal breeding.

(ii) Breeding between a superior male of one breed with a superior female of another breed.

(iii) The cross breed progeny has superior traits (hybrid vigour or heterosis.)

32. (i) To diagnose pathological conditions such as hypertension and hypotension

(ii) Helps to assess the state of blood circulation.

(iii) Provides the functional details of heart.

33. (i) Breathing with a hoarse sound during sleep is caused by the vibration of the soft palate.

(ii) Snoring is caused by a partially closed upper airway (nose and throat) which becomes too narrow for enough air to travel through the lungs.

(iii) This makes the surrounding tissues to vibrate and produces the snoring sound.

PART - IV

34. (a)

Rod cells	Cone cells
Rods are responsible for vision in dim light.	The cones are responsible for colour vision and works best in the bright light.
The pigment present in the rods is rhodopsin, formed of a protein scotopsin and retinal (an aldehyde of vitamin A).	The pigment present in the cones is photopsin, formed of opsin protein and retinal.
There are about 120 millions rod cells.	There may be 6-7 millions cone cells.
Rods are predominant in the extra fovea region.	Cones are concentrated in the fovea region.

(OR)

(b)

S. No.	Hypoglycaemia	Hyperglycaemia
1.	It is a disorder caused due to increased secretion of insulin hormone.	It is disorder caused due to reduced secretion of insulin hormone.
2.	Blood glucose level decreases.	Blood glucose level increases.
3.	Different types are not seen.	It is classified into two types: **a) Type I :** Insulin dependent diabetes due to illness or viral infection. **b) Type II :** Non insulin dependent diabetes due to reduced sensitivity to insulin.
4.	**Symptoms :** Glucose level lowers than normal fasting index, increased heart beat, weakness, nervousness, headache, confusion, lack of co-ordination, slurred speech, brain defects like epilepsy, coma etc.	**Symptoms :** Polyurea (excessive urination), polyphagia (excess intake of food), polydipsia (excessive fluid intake due to thirst), ketosis etc.

35. (a)

S.No	Chordates	Non-Chordates
1.	Notochord is present	Notochord is absent
2.	Dorsal, hollow and single nerve cord	Double ventral solid nerve cord
3.	Pharynx perforated by gill slits	Gill slits absent
4.	Heart is ventrally placed	Heart is dorsal or laterally placed or absent
5.	A post anal tail is present	Post anal tail is absent
6.	Alimentary canal is placed Ventral to the nerve cord	Alimentary canal is placed dorsal to the nerve cord

(OR)

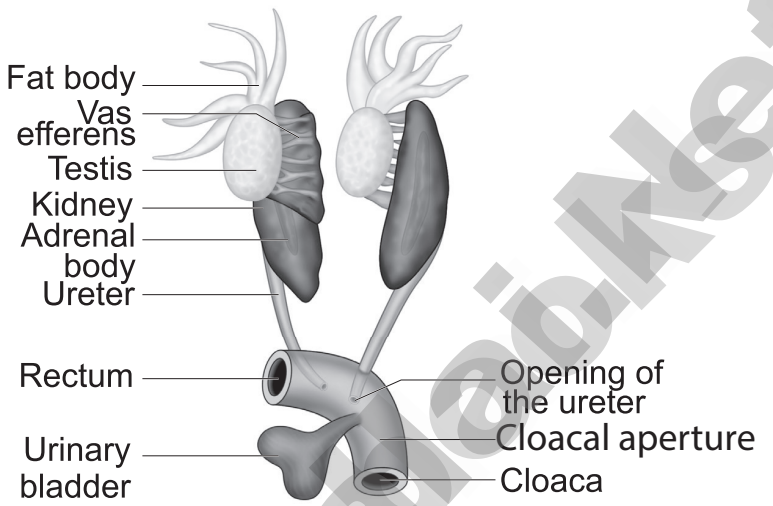
(b) Male reproductive system of frog:

(i) The **male frog** has a pair of testes which are attached to the kidney and the dorsal body wall by folds of peritonium called **mesorchium.**

(ii) Vasa efferentia arise from each **testis.**

(iii) They enter the kidneys on both side and open into the bladder canal.

(iv) Finally, it communicates with the urinogenital duct that comes out of kidneys and opens into the cloaca.



36. (a) 1. Destroys aging and defective blood cells.

2. Stores glucose in the form of glycogen or disperses glucose into the blood stream with the help of pancreatic hormones.

3. Stores fat soluble vitamins and iron.

4. Detoxifies toxic substances.

5. Involves in the synthesis of non- essential amino acids and urea.

(OR)

(b) The steps involved in respiration are

(i) The exchange of air between the atmosphere and the lungs.

(ii) The exchange of O_2 and CO_2 between the lungs and the blood.

(iii) Transport of O_2 and CO_2 by the blood.

(iv) Exchange of gases between the blood and the cells.

(v) Uptake of O_2 by the cells for various activities and the release of CO_2.

37. (a) (i) When there is excessive loss of fluid from the body or when there is an increase in the blood pressure, the osmoreceptors of the hypothalamus respond by stimulating the neurohypophysis to secrete the antidiuretic hormone (ADH) or vasopressin (a positive feedback).

(ii) ADH facilitates reabsorption of water by increasing the number of aquaporins on the cell surface membrane of the distal convoluted tubule and collecting duct. This increase in aquaporins causes the movement of water from the lumen into the interstitial cells, thereby preventing excess loss of water by diuresis.

(iii) When you drink excess amounts of your favourite juice, osmoreceptors of the hypothalamus is no longer stimulated and the release of ADH is suppressed from the neurohypophysis (negative feedback) and the aquaporins of the collecting ducts move into the cytoplasm.

(iv) This makes the collecting ducts impermeable to water and the excess fluid flows down the collecting duct without any water loss. Hence dilute urine is produced to maintain the blood volume. Vasopressin secretion is controlled by positive and negative feedback mechanism.

(v) Defects in ADH receptors or inability to secrete ADH leads to a condition called diabetes insipidus, characterized by excessive thirst and excretion of large quantities of dilute urine resulting in dehydration and fall in blood pressure.

(OR)

(b) Regular exercises can produce the following beneficial physiological changes:

(i) The muscles used in exercise grow larger and stronger.

(ii) The resting heart rate goes down.

(iii) More enzymes are synthesized in the muscle fibre.

(iv) Ligaments and tendons become stronger.

(v) Joints become more flexible.

(vi) Protection from heart attack.

(vii) Influences hormonal activity.

(viii) Improves cognitive functions.

(ix) Prevents Obesity. Promotes confidence, esteem.

(x) Prevents depression, stress and anxiety.

38. (a)

Sl. No.	Arteries	Veins
1.	The wall of arteries is thick and non- collapsible.	The wall of the vein is thin and have a larger lumen. They can be easily stretched.
2.	Arteries carry blood away from the heart.	Veins bring blood from different parts of the body to the heart.
3.	All arteries carry oxygenated blood except the pulmonary artery.	All veins carry deoxygenated blood except the pulmonary veins.
4.	Arteries have no valves.	Veins have valves to prevent back flow of blood.
5.	The blood flows in arteries with great pressure.	The flow of blood in the veins is under low pressure.

(OR)

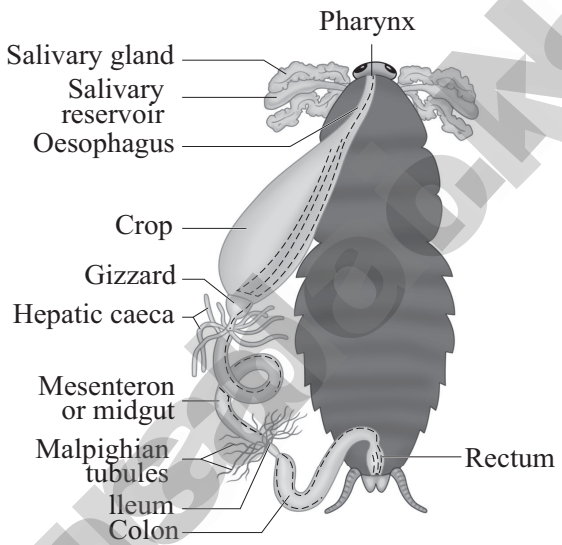
(b) Digestive system :

(i) The digestive system of cockroach consists of the alimentary canal and digestive glands.

(ii) The alimentary canal is present in the body cavity and is divided into three regions: foregut, midgut and hindgut.

(iii) The foregut includes pre-oral cavity, mouth, pharynx and oesophagus. This in turn opens into a sac like structure called the crop which is used for storing food.

(iv) The crop is followed by the **gizzard** or **proventriculus** which has an outer layer of thick circular muscles and thick inner cuticle forming six highly chitinous plates called "**teeth**". Gizzard helps in the grinding of the food particles.



Digestive system of cockroach

(v) The midgut is a short and narrow tube behind the gizzard and is glandular in nature.

(vi) At the junctional region of the gizzard are eight fingers like tubular blind processes called the **hapatic caecae or enteric caecae**.

(vii) The hindgut is marked by the presence of 100 – 150 yellow coloured thin filamentous **malphigian** tubules which are helpful in removal of the excretory products from the haemolymph. The hindgut is broader than the midgut and is differentiated into ileum, colon, and rectum. The rectum opens out through the anus.

(viii) Digestive glands of cockroach consist of the salivary glands, the glandular cells and hepatic caecae. A pair of salivary glands is found on either side of the crop in the thorax. The glandular cells of the midgut and hepatic or gastric caecae produce digestive juices.