UNIT 8

Organ Systems in Animals

BQGLRV

TEXT BOOK EXERCISES

I. Choose the correct answer

1. Which of the following is not a salivary gland?
   a. Sublingual b. lachrymal
   c. Submaxillary d. parotid

   Ans: b. lachrymal

2. Stomach of man mainly digests _____
   a. Carbohydrates b. proteins
   c. Fat d. Sucrose

   Ans b. proteins:

3. To prevent the entry of food into the trachea, the opening is guarded by _____
   a. epiglottis b. glottis
   c. hard palate d. soft palate

   Ans: a. epiglottis

4. Bile helps in the digestion of _____
   a. proteins b. sugar
   c. fats d. carbohydrates

   Ans: c. fats

5. Excretion means _____
   a. taking in oxygen from the air and giving out carbon dioxide
   b. disposal of harmful germs and worms from our body
   c. distribution of digested food to the body tissues through blood
   d. removal of nitrogenous wastes generated in the body

   Ans: d. removal of nitrogenous wastes generated in the body

6. The structural and functional unit of the kidney is _____
   a. villi b. liver
   c. nephron d. ureter

   Ans: c.nephron

7. Which one of the following substance is not a constituent of sweat?
   a. urea b. protein
   c. water d. salt

   Ans: b. protein

8. The common passage meant for transporting urine and sperms in male is _____
   a. ureter b. urethra
   c. vas deferens d. scrotum

   Ans: b. urethra

9. Which of the following is not a part of female reproductive system?

a. Ovary b. uterus

c. testes d. fallopian tube

Ans: c. testes

II. Fill in the blanks

1. The opening of the stomach into the intestine is called _____.

Ans: pyloric sphincter

2. The muscular and sensory organ which helps in mixing the food with saliva is _____.

Ans: tongue

3. Bile, secreted by liver is stored temporarily in _____.

Ans: gall bladder

4. The longest part of alimentary canal is _____

Ans: small intestine

5. Organs which are concerned with the formation, storage and elimination of urine constitute the _____.

Ans: excretory system(urinary system)

6. The human body functions normally at a temperature of about _____.

Ans: 37°C or 98.4°F

7. In the process of urine formation, maximum amount of water from the glomerular filtrate is reabsorbed in the _____.

Ans: proximal convoluted tubule

8. The largest cell in the human body of a female is _____.

Ans: ovum (egg)

III. State whether the following statements are true or false. If false, correct the wrong statements:

1. Nitric acid in the stomach kills microorganisms in the food.

Ans: False,

Hydrochloric acid in the stomach kills microorganisms in the food.

2. During digestion, proteins are broken down into amino acids.

Ans: True

3. Glomerular filtrate consists of many substances like amino acids, vitamins, hormones, salts, glucose and other essential substances.

Ans: True

4. Besides the normal constituents, the urine may pass out excess vitamins and not the antibiotics.

Ans: True

5. The process of release of ovum from ovary is called gestation.

Ans: False,

The process of release of ovum from ovary is called ovulation.

IV. Identify the following parts:

1. It conducts food from pharynx to stomach by peristalsis-

Ans: Oesophagus

2. Finger-like projections which enhances the absorbing capacity of small intestine-

Ans: Villi

3. The bunch of capillaries inside the Bowman's capsule-

Ans: Glomerulus

4. Thin muscular tubes which carry urine from kidney to urinary bladder-

Ans: Ureter

5. Small sac-like muscular structures that encloses testes-

Ans: Scrotum

V. Very short answer questions

1. Arrange the following five steps of nutrition in correct sequence: (digestion, assimilation, ingestion, egestion, absorption)

   i) Ingestion
   ii) digestion
   iii) absorption
   iv) assimilation
   v) egestion,

2. The stomach secretes gastric juice, which contains hydrochloric acid. What is its function?

   Hydrochloric acid kills the bacteria swallowed along with food.

3. How is the small intestine designed to absorb digested food?

   Ileum part of the small intestine contains minute finger like projectors called villi absorbs digested food.

4. Why do we sweat?

   To regulate our body temperature, so we sweat.

5. State any two vital functions of human kidney.

   1. Maintain the fluid and electrolytes balance in our body.
   2. Regulate acid-base balance of blood.
   3. Maintain the osmotic pressure in blood and tissues.

6. How is it possible to control the urge to pass urine?

   If the abdominal region muscle is stretched internally one can control urination.

7. Write the names of male and female sex hormone.

   Male sex hormone : Testosterone
   Female sex hormome : Oestrogen & progesterone

VI. Short answers questions

1. Define the following terms:

   a. Digestion b. Osmoregulation
   c. Emulsification d. Ovulation

   a. Digestion

   The breakdown of large complex insoluble food molecules into small, simpler soluble and diffusible particles by the action of digestive enzymes is called digestion.

   b. Osmoregulation

   The maintenance of constant osmotic pressure in the fluids of an organism by the control of water and salt concentrations.

   c. Emulsification

   Conversion of large fat droplets into smaller ones in the digestive system is called Emulsification.

   d. Ovulation

   Release of ovum from an ovary is called ovulation.

2. Name the types of teeth present in an adult human being. Mention the functions of each.

Types of teeth	Number of teeth	Functions
Incisors	8	Cutting and biting
Canines	4	Tearing and piercing
Premolars	8	Crushing and grinding
Molars	12	Crushing, grinding and mastication

3. What are the end products of digestion of starch, proteins and fats respectively?

   Starch - Glucose
   Proteins - Amino acid
   Fat - Fatty acid & Glycerol

4. Explain the structure of nephron.

Each kidney consists of more than one million nephrons. **Nephrons or uriniferous tubules** are structural and functional units of the kidneys. Each nephron consists of **Renal corpuscle** or **Malphigian corpuscle** and **renal tubule**. The renal corpuscle consists of a cup-shaped structure called **Bowman's capsule** containing a bunch of capillaries called **glomerulus**. Blood enters the glomerular capillaries through **afferent** arterioles and leaves out through **efferent** arterioles. The Bowman's capsule continues as the renal tubule which consists of three regions **proximal convoluted tubule**, U-shaped hair pin loop, **the loop of Henle** and the **distal convoluted tubule**. The distal convoluted tubule which opens into the **collecting tubule**.

5. Differentiate the following terms:

a. Excretion and secretion
b. Absorption and assimilation
c. Sperm and ovum
d. Ingestion and egestion
e. Diphyodont and heterodont
f. Incisors and canines

a. Excretion : Removal of nitrogenous waste.
Secretion : Release the chemical substances like enzymes , hormones by the glands.

b. Absorption : Nutrients obtained after digestion by villi is called absorption.
Assimilalation : The incorporation of the absorbed food materials into tissue.

c. Sperm : The male gamete is called sperm.
Ovum : The female gamete is called ovum.

d. Ingestion : Intake of food by the organisms is called ingestion.
Egestion : The undigested food thrown out from the body through the anal aperture is called egestion.

e. Diphyodont : Two sets of teeth is called diphyodont.
Heterodont : If the teeth are different type than it is called heterodont.

f. Incisors : Teeth which are used to cut and bite the food.
Canines : Teeth which are used tear and pierce the food.

6. What are the functions of ovaries and uterus in female reproductive system?

* Functions of ovary produce female gametes and secrete female sex hormones functions of uterus.

* supports the development of feetus.

7. Match the following:

Organ	Elimination
Skin	a. Urine
Lungs	b. Sweat
Intestine	c. Carbon dioxide
Kidneys	d. undigested food

Ans:

Organ	Elimination
Skin	a. Sweat
Lungs	b. Carbon dioxide
Intestine	c. undigested food
Kidneys	d. Urine

8. Give reasons for the following:

a. Scrotum remains outside the body of human males.
b. The wall of the stomach is not digested by its own enzyme.

Ans:

a. **To provide an optimum temperature for the formation of sperms. Scrotum remains outside the body.**

b. **Mucus protects the walls of stomach from digestion.**

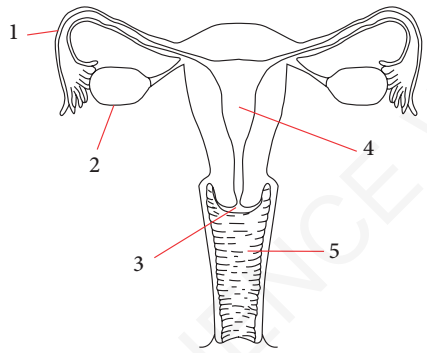
9. Complete the following table:

Enzymes	Nutrient (Substrate)	End products of digestion
Erepsin (peptidase)	proteins and peptides	---------
Maltase	----------	glucose
Sucrase	sucrose	---------- --- and-------- ---
Lactase		glucose and galactose
----------	fats	fatty acids and glycerol

Ans:

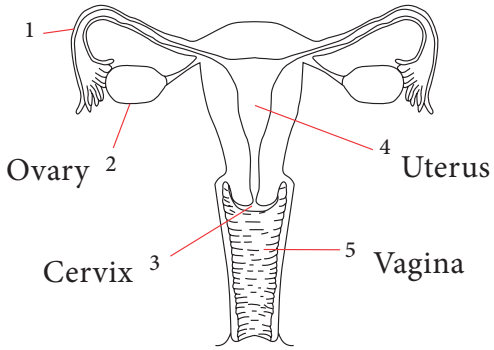
Enzymes	Nutrient (Substrate)	End products of digestion
Erepsin (peptidase)	proteins and peptides	**Amino acid**
Maltase	**Maltose**	glucose
Sucrase	sucrose	**Glucose** and **Fructose**
Lactase	**Lactose**	glucose and galactose
Lipase	fats	fatty acids and glycerol

VII. Match the parts of the given figure with the correct option.



Ans:

Fallopian tube



1	2	3	4	5
a. Fallopian tube	Oviduct	Uterus	Cervix	Vagina
b. Oviduct	Cervix	Vagina	Ovary	Vas deferens
c. Ovary	Oviduct	Uterus	Vagina	Cervix
d. Fallopian tube	Ovary	Cervix	Uterus	Vagina

VIII. Long answer questions

1. Describe the alimentary canal of man.

Alimentary canal is a muscular coiled, tubular structure. It consists of mouth, buccal cavity, pharynx, oesophagus, stomach, small intestine (consisting of duodenum, jejunum and ileum), large intestine (consisting of caecum, colon and rectum) and anus.

Mouth: The mouth leads into the buccal cavity. It is bound by two soft, movable upper and lower lips.

Teeth: Teeth are hard structures meant for holding, cutting, grinding and crushing the food.

Salivary glands: Three pairs of salivary glands are present in the mouth cavity. They are: parotid glands, sublingual glands and submaxillary or submandibular glands .

Tongue: The tongue is a muscular, sensory organ which helps in mixing the food with the saliva. The taste buds on the tongue help to recognize the taste of food.

Pharynx: The pharynx is a membrane lined cavity behind the nose and mouth, connecting them to the oesophagus.

Oesophagus: Oesophagus or the food pipe is a muscular-membranous canal about 22 cm in length. It conducts food from pharynx to the stomach

Stomach: The stomach is a wide J-shaped muscular organ located between oesophagus and the small intestine. The gastric glands present in the inner walls of the stomach secrete gastric juice. The gastric juice is colourless, highly acidic, containing mucus, hydrochloric acid and enzymes rennin (in infants) and pepsin.

Small intestine: The small intestine is the longest part of the alimentary canal, which is a long coiled tube measuring about 5 – 7 m. It comprises three parts- duodenum, jejunum and ileum.

Absorption: Absorption is the process by which nutrients obtained after digestion are absorbed by villi and circulated throughout the body by blood and lymph and supplied to all body cells according to their requirements.

Assimilation: Assimilation means the incorporation of the absorbed food materials into the tissue cells as their internal and homogenous component.

Large intestine: The unabsorbed and undigested food is passed into the large intestine. It extends from the ileum to the anus. It is about 1.5 meters in length. It has three parts- caecum, colon and rectum. The rectum is the last part which opens into the anus. It is kept closed by a ring of muscles called anal sphincter which opens when passing stools.

Egestion: The undigested or unassimilated portion of the ingested food material is thrown out from the body through the anal aperture as faecal matter. This is known as egestion or defaecation.

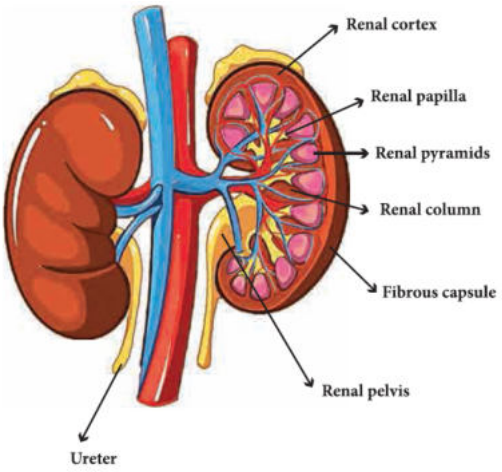
2. Explain the structure of kidney and the steps involved in the formation of urine

Kidneys are bean-shaped organs reddish brown in colour. The kidneys lie on either side of the vertebral column in the abdominal cavity attached to the dorsal body wall. The right kidney is placed lower than the left kidney as the liver takes up much space on the right side. Each kidney is about 11 cm long, 5 cm wide and 3 cm thick.

The kidney is covered by a layer of fibrous connective tissue, the renal capsules, adipose capsule and a fibrous membrane.

Internally the kidney consists of an outer dark region, the **cortex** and an inner lighter region, the **medulla**. Both of these regions

BQK9FS



contain **uriniferous tubules** or **nephrons**. The medulla consists of multitubular conical masses called the medullary pyramids or renal pyramids whose bases are adjacent to cortex. On the inner concave side of each kidney, a notch called **hilum** is present through which blood vessels and nerves enter in and the urine leaves out.

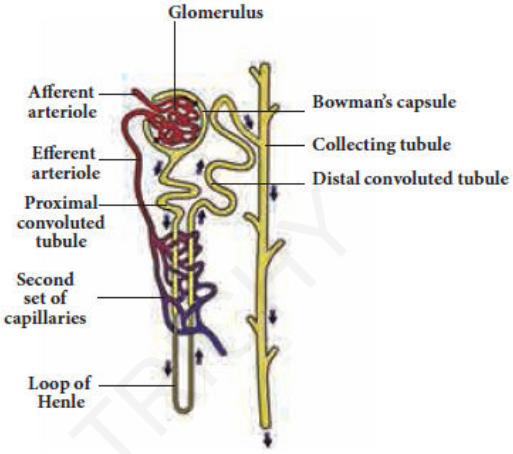
Mechanism of Urine Formation

The process of urine formation includes the following three stages.

- Glomerular filtration
- Tubular reabsorption and
- Tubular secretion

Glomerular filtration: Urine formation begins with the filtration of blood through epithelial walls of the glomerulus and Bowman's capsule. The filtrate is called as the glomerular filtrate. Both essential and non-essential substances present in the blood are filtered.

Tubular reabsorption: The filtrate in the proximal tubule consists of essential substances such as glucose, amino acids, vitamins, sodium, potassium, bicarbonates and water that are reabsorbed into the blood by a process of **selective reabsorption**.



Tubular secretion: Substances such as H^+ or K^+ ions are secreted into the tubule. Certain substances like potassium and a large number of drugs like penicillin and aspirin are passed into the filtrate in the distal convoluted tubule. This tubular filtrate is finally known as urine, which is **hypertonic** in man. Finally the urine passes into collecting ducts to the pelvis and through the ureter into the urinary bladder by urethral peristalsis (waves of constriction in the ureters). The relaxation of sphincter muscles located at the opening of the urinary bladder into the urethra. When the urinary bladder is full the urine is expelled out through the urethra. This process is called **micturition**. A healthy person excretes one to two litres of urine per day.

IX. Assertion and Reason

Direction: In each of the following questions, a statement of Assertion is given and a corresponding statement of Reason is given just below. Of the four statements, given below, mark one as the correct answer.

a. If both Assertion and Reason are true and Reason is the correct explanation of Assertion

b. If both Assertion and Reason are true but Reason is not the correct explanation of Assertion

c. If Assertion is true but Reason is false

d. If both Assertion and Reason are false

1. Assertion: Urea is excreted out through the kidneys

Reason: Urea is a toxic substance. Excess accumulation of urea in blood may lead to death

Ans:

a. both Assertion and Reason are true and Reason is the correct explanation of Assertion

2. Assertion: In both the sexes gonads perform dual function

Reason: Gonads are also called primary sex organs

Ans:

b. both Assertion and Reason are true but Reason is not the correct explanation of Assertion

X. Thinking skills

1. If pepsin is lacking in gastric juice, then which event in the stomach will be affected?

a. digestion of starch into sugars

b. breaking of proteins into peptides

c. digestion of nucleic acids

d. breaking of fats into glycerol and fatty acids

Ans: b. breaking of proteins into peptides

2. Rearrange the jumbled sequence of the different parts of alimentary canal in proper sequence. (Oesophagus, Small intestine, Stomach, Large intestine, anus, mouth, rectum)

Ans:

mouth,Oesophagus,Stomach, Small intestine, Large intestine, rectum,anus.

3. Select the substances given below that need to be excreted from the body. (urea, amino acids, carbon dioxide, uric acid, glucose)

Ans:

urea, uric acid, and carbon dioxide .

4. Name the blood vessel that (a) enter malphigian capsule and (b) leaves malphigian capsule

a. Afferent arteriole

b. Efferent arteriole

5. Rearrange the jumbled words and fill in the blanks in the following passage to make it a meaningful description.

The human urinary system consists of a pair of _____ (nyedik), which form the urine; a pair of _____ (ertreu), which conduct the _____ (neuri) from kidneys to the _____ (naryuri drebdal) for storage of urine and a ____ (reuhrat) through which the urine is voided by bladder contractions.

Ans:

The human urinary system consists of a pair of **kidney** (nyedik), which form the urine; a pair of **ureter** (ertreu), which conduct the **urine** (neuri) from kidneys to the **urinary bladder** (naryuri drebdal) for storage ofurine and a **urethera** (reuhrat) through which the urine is voided by bladder contractions.