

## **Zoo302 Midterm Fall 2022 Questions**

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QNo.1

### **Antiperistalsis :**

The reverse peristalsis is called Antiperistalsis, which occurs occasionally.

- These movements cause the passage of food from the intestine back into the stomach or even into the mouth. This is also called vomiting.

**Q No.**

### **How Fishes live in extremely cold water?**

1. They have “antifreeze” materials in their blood in the form of Polyalcohols (e.g., sorbitol, glycerol) or water soluble peptides and glycopeptides.  
Because these substances lower the freezing point of blood plasma and other body fluids.
2. These fishes also have proteins or protein-sugar compounds that inhibit the growth of ice crystals that begin to form.
- 3. These adaptations enable these fishes to stay flexible and swim freely in a super-cooled state (i.e., at a temperature below the normal freezing temperature of a surrounding water).

### **Q NO. Define Digestion**

Digestion is the chemical and/or mechanical breakdown of complex food into diffusible molecules i.e. particles that individual cells of an animal can absorb.

- Starch into glucose.
- Proteins into amino acids.
- Fats into fatty acids & glycerol.

### **QNo. Intracellular and Extracellular digestion?**

Digestion is of two main **types**: Intracellular and Extracellular.

In intracellular digestion breakdown of food occurs within the cells.

First food is taken into the cell vacuole.

The cytoplasm secretes digestive enzymes into the food vacuole. Enzymes break larger molecules into smaller ones, which enter the cytoplasm.

### **• In extracellular digestion,**

In it, the enzymes are secreted outside the cell into the gut cavity or lumen where digestion occurs.

### **QNo. Gastrointestinal (GI)?**

As with any organ, the function of the gastrointestinal tract is determined by the type of tissues it contains.

- Most of the mammalian gastrointestinal tract has the same anatomical structure along its entire length.

From the outside inward is a thin layer of connective tissue called the serosa.

The serosa forms a moist epithelial sheet called the peritoneum. This peritoneum lines the entire abdominal cavity and covers all internal organs. Next are the longitudinal smooth-muscle layer and circular smooth-muscle layer.

Underneath this muscle layer is the submucosa. The submucosa contains connective tissue, blood, and lymphatic vessels.

- The mucosa faces the central opening, which is called lumen. The coordinated contractions of the muscle layers of the gastrointestinal tract mix the food material with various secretions and move the food from the oral cavity to the rectum.

The two types of movement involved are peristalsis and segmentation.

Q No.

### **Digestion in Grasshopper**

#### **Digestive System in Insects**

During feeding, grasshopper's mandibles and maxillae first break up (masticate) the food, which is then taken into the mouth and passed to the crop via the esophagus. where salivary glands secrete saliva also contains the enzyme amylase, which digest carbohydrates. This digestion continues during food storage in the crop. The midgut secretes other enzymes (carbohydrases, lipases, proteases) that enter the crop. Food passes slowly from the crop to the stomach, where it is mechanically reduced and the nutrient particles sorted. The small particles enter the gastric caeca, where extracellular digestion and absorption is completed. Undigested food is moved along the intestine and passes into the rectum, where water and ions are absorbed. The solid fecal pellets are removed via the anus.

### **Q No. The ruminant stomach:**

Ruminant mammals are the animals that “chew their cud,” such as cows, sheep, and deer.

The ruminant stomach provides an opportunity for large numbers of microorganisms to digest the cellulose walls of grass and other vegetation.

- Cellulose contains a large amount of energy; however, animals generally lack the ability to produce the enzyme cellulase for digesting cellulose and obtaining its energy. Because gut microorganisms can produce cellulase, they have made the herbivorous lifestyle more effective.

Q No.

### **Define Osmoregulation:**

It is defined as the maintenance of constant osmotic pressure in the fluids of an organism by the control of water and salt concentrations. It means osmoregulation governs water and salt balance, and excretion of metabolic wastes.

In fishes, reptiles, birds, and mammals, the kidneys are the primary osmoregulatory structure.

QNo.

**How does the primitive streak develop in birds 🐦?**

The formation of the primitive streak in the blastocyst involves the coordinated movement and re-arrangement of cells in the epiblast. Even before the streak is visible, epiblast cells have started to move. Two counter-rotating flows of cells meet at the posterior end, where the streak forms.

### Q No. Digestion in Small Intestine

Duodenum:

When chyme passes from the stomach into duodenum, its acidity stimulates the release of three secretions:

- 1. Digestive enzymes
- 2. Pancreatic enzymes
- 3. Bile

Intestinal Enzymes:

- In the duodenum, digestion of carbohydrates and proteins is completed, and most lipids are digested.
- The jejunum and ileum absorb the end products of digestion (amino acids, simple sugars, fatty acids, glycerol, nucleotides, water).

Absorption of Foods:

- Much of this absorption involves active transport and the sodium dependent ATPase pump.
- Sugars and amino acids are absorbed into the capillaries of the villi. Free fatty acids enter the epithelial cells of the villi and recombine with glycerol to form triglycerides.
- The triglycerides are coated with proteins to form small droplets called chylomicrons, which enter the lacteals of villi.

### Q No. Function of small intestine

In the **duodenum**, digestion of carbohydrates and proteins is completed, and most lipids are digested.

- The main function of the **jejunum** is absorption of important nutrients-sugars, fatty acids, and amino acids.

The function of the **ileum** is mainly to absorb vitamin B12, bile salts, and any products of digestion that were not absorbed by the jejunum.

### QNo. How do the freshwater Teleosts osmoregulation in fresh and marine water?

To combat this, freshwater fish have very efficient kidneys that excrete water quickly. They also reabsorb salt from their urine before it is ejected to minimize losses and actively take salt from their environment using special cells in the gills.