NUTRITION IN ANIMALS

1. a) Rhizobium

   b) Symbiosis

2. a) Activate enzymes

   b) Magnesium/zinc

3. Scuvy

4. - Rickets

   - Goitre

5. Sharp/ hooked/ strong beaks for killing/ripping off flesh from bones, sharp claws for grabbing/holding prey.

6. i) Salting -This removes / absorbs water by osmosis from micro-organism cell. Which then die due to dehydration. Meat also becomes dehydrated and thus unsuitable for microbial growth.

   ii) Refrigeration –Low temperature renders the micro-organism inactive (Enzymes do not work at low temperature).

   iii) Canning –Boiling kills all micro-organism in the food. Sealing under pressure excludes all micro-organisms and ensures that growth takes place.

7. Similarity: Both are heterotrophic.

   Difference: Predators kill to get food while parasites obtain foods without killing the host.

8. Pancreatic juice containing digestive enzymes is prevented from reaching food. Insulin and glycogen hormones which regulate sugar are released directly into the blood stream.

9. Roughage provide grip needed for peristalsis/lack of roughage results in slow/no movement of food leading to constipation. (Accept: add bulk to peristalsis to take place)

10. a) Breakdown of (complex) food substance by enzymes to simpler compounds which can be absorbed.

b)
- Small intestine is long/coiled to offer large surface area for digestion and absorption.
- The walls are muscular for peristalsis.
- Inner walls posses mucus glands, goblet cell; that secret mucus for lubrication and protection of the walls from digestive enzymes.
- The inner walls have digestive glands that secrete digestives enzymes.
- The inner walls has villi to increase surface area for absorption.
- The villi have numerous blood vessels for transport of the end products of digestion.
- The villi also have lacteal vessels, for transport of fats/lipids.

11. - Quicken healing of wounds
- Forms connective tissues of the teeth and jaws.
- Provides resistance to body infections

12. a) Homodont-Organism has same number of teeth, type of teeth and the same size.

b) Slice fish and crush bones

c) $I=\frac{0}{3}, C=\frac{0}{3}, PM=\frac{3}{3}, M\frac{3}{3}$

13.

a) -Has alkaline salts that help create alkaline media to neutralize acidic food from stomach.

-Enhance emulsification of fats into droplets

b) As the substance concentration decreases the rate of enzyme action decreases.

14. -Hydrogen ions, ATP molecules

-Oxygen gas

15. a) i) - Premolar tooth

ii) - Presence of two roots

- Presence of cusps on the crown.

b) Has a blood vessel that provides nourishment to the tooth and remove waste products.

16. a) Vitamin D, Vitamin K

b) - Transmission of nerve impulses.

- Ionic balance/osmotic balance

- Contraction of muscles.

17. a) In the stomach there is acid medium and ptyalin only acts at slightly alkaline medium.

b) High temperatures above 40^0C.

c) -Villi

- Microvilli

18. a) Ingestion is the taking of food into the body.

b) Digestion is the breakdown of large and insoluble molecules that can be absorbed.

c) Absorption is the uptake of soluble food materials from lumen of digestive tract across the epithelial lining of the gut into blood stream.

d) Assimilation is the utilization of absorbed food molecules by the body to provide energy or the materials necessary for growth, repair and reproduction.

e) Egestion in the elimination of undigested waste food materials from the body.

19. a) They produce saliva. Saliva contains the enzyme salivary amylase (ptyalin) which begins the digestion of starch breaking it to maltose. It also lubricates food making it suitable for swallowing.

b) It produces pancreatic juice. Contains $NaHCI_3$ which neutralizes the acid of chime and creates a PH of 7-8 which is the Optimum PH for the action of pancreatic juice are;-

- Trypsin which digests protein to peptides.
- Amylase which digests starch to maltose
- Lipase which digests fats to fatty acids and glycerol

c) It produces bile. Bile salts droplets a process called emulsification. This increases the surface area of the fat enhancing the action of pancreatic lipase.

20. i) It lubricates food

ii) It prevents digestion of the gut wall by proteolytic enzymes

iii) It makes food particles to adhere to one another during swallowing and during gestation.

21. Hydrochloric acid in the stomach denatures salivary amylase stopping its activity.

22. A sheep has the following herbivorous adaptations.

- It has a thick horny pad on the upper jaw over which vegetation is pressed by chisel-like incisors and canines on the lower jaw during feedings.
- If has a diastema which provides space for tongue movements that separate grass which is being chewed by check teeth and grass that is newly gathered by front teeth.
- Its premolars and molars have large top surface, which is worn out unevenly forming cusps which help in crushing and grinding of vegetation.
- The joints of the jawbones are loose allowing up and down as well as sideways movement of the lower jaw, which aids in the grinding of vegetation.
- Its rumen contains microorganisms that ferment cellulose releasing simple fatty acids that are absorbed by the animal.

23. i) Pepsin-digests proteins to peptides

ii) Rennin-Coagulation of milk proteins to peptides

iii)
- Hcl-converts pepsinogen to pepsin
- Kills bacteria in food
- Provides an acidic pH (pH 1.5-2.5) which is the optimum pH for action of Pepsin
- Unfolds proteins enabling pepsin to work on them.

24. This leads to lack of bile salts, which emulsify fats.

25.

	Nutrient	Food Source	Role in the body
a)	Vitamin A	Carrots, Liver, Egg yolk	Synthesis of rhodopsin (for proper function of retinal).
b)	Iron	Liver	Manufacture of hemoglobin

c)	Iodine	Iodized salt, sea food	Manufacture thyroxin
d)	Vitamin D	Fish, liver, plant oil, egg yolk	Aids assimilation of calcium phosphate for making teeth and bones.
e)	Protein	Meat, milk seed of legumes, fish	Making new cells/growth and repair of tissues.