BIO - ZOOLOGY

(Book back Questions & Additional Questions)

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CHAPTER 1. THE LIVING WORLD

Book Back Questions : -

1. A living organism is differentiated from non-living structure based on
   a. Reproduction b. Growth c. Metabolism **d. All the above**
2. A group of organisms having similar traits of a rank is
   a. Species b. Taxon c. Genus d. Family
3. Every unit of classification regardless of its rank is
   a. Taxon b. Variety c. Species d. Strain
4. Which of the following is not present in same rank?
   a. Primata b. Orthoptera c. Diptera d. Insecta
5. What taxonomic aid gives comprehensive information about a taxon?
   a. Taxonomic Key b. Herbarium c. Flora d. Monograph
6. Who coined the term biodiversity?
   a. Walter Rosen b. AG Tansley c. Aristotle d. AP de Candole
7. Cladogram considers the following characters
   a. Physiological and Biochemical **b. Evolutionary and Phylogenetic**
   c. Taxonomic and systematic d. None of the above
8. Molecular taxonomic tool consists of
   a. DNA and RNA b. Mitochondria and Endoplasmic reticulum
   c. Cell wall and Membrane proteins d. All the above

9.Differentiate between probiotics and pathogenic bacteria:

	Probiotic Bacteria	Pathogenic Bacteria
1.	It is Useful bacterias	It is Harmful bacterias
2.	Convert Milk into Curd. ex: Lactobacillus	Causes Diseasein plants & animals. ex:Vibrio cholera causes cholera.

9) Why mule is sterile in nature?

- ❖ Crosses between the male donkey and female horse,they can produce sterile offspring.
- ❖ Because of mating with closely related species,and it can't make sperm or eggs.

10) List any five salient features of the family"*Felidae*":-

1. It is basically a cat family.
2. They are obligate Carnivores.
3. They have sharp teeth and claws to catch and eat prey.
4. Mostly solitary, secretive and nocturnal.
5. Acute sense-hearing,smell,vision and touch.

11) What is the role of Charles Darwin in relation to concept of species?

- ❖ In his book"**Origin of species"**- explains the evolutionary connection of species by the process of natural selection.

12) Why elephants and other wild animals are entering in to human living area?

- ➢ Destroying the forest and wild areas for human activites.
- ➢ They are entering in to human living area for searching its foods and shelter.

13) What is the difference between a Zoo and wildlife sanctuary?

No	ZOO	Wildlife Sanctuary
1.	Animals are kept for public exhibition	Wild animals are protected and preserved.
2.	It is an artificial habitat and supplied prepared food For kept animals.	They live natural habitat,and get their food from natural environments.

14) Can we use recent molecular tools to identify and classify organisms?

1. **DNA barcoding-** to identify it as belonging to a particular species.
2. **DNA hybridization-**measures the degree of genetic similarity between pools of DNA sequences.
3. **DNA fingerprinting-**to identify an individual from a sample of DNA.

15) Explain the role of Latin and Greek names in Biology.

❖ To uniformity of scientific names all through out the world. So latin and greek words commonly used in Systematic names and to understand the scientific names of organisms.

Additional questions:

- ❖ _____ is a community of biotic and abiotic factors and their interrelationships - **Ecosystem**
- ❖ The word _____ was coined by *Augustin pyramus de candole* - **Taxonomy**
- ❖ _____ is father of taxonomy - **Aristotle**
- ❖ _____ is the father of modern taxonomy - **Carolus Linnaeus**
- ❖ _____ was known as the "father of Botany" - **Theophrastus**
- ❖ _____ are photosynthetic blue green algae which produce oxygen - **Cyanobacteria**
- ❖ _____ is the basic unit of classification in taxonomic hierarchial system - **Species**
- ❖ Binomial Nomenclature was popularized by _____ - **Carolus Linnaeus**
- ❖ Arignar Anna Zoological Park also known as the _____ - **Vandalur Zoo**

Choose the correct Answers:

1. _____ attempted a basic classification of all living organism into plants and animals
   a. John Ray **b. Aristotle** c. De Candole d. Tansely
2. Cladistic classification summarizes the genetic differences between all species in the _____
   a. Pedigree chart b. Family tree c. DNA barcoding **d. Phylogenetic tree**
3. Phylogenetic tree otherwise known as _____
   a. Cladogram b. Karyogram c. Idiogram d.Mamogram
4. _____ proposed Five kingdom classification
   a. John Ray b. Aristotle c. De Candole **d. R.H. Whittaker**
5. Three domain classification was proposed by _____
   b. John Ray **b. Carl Woese** c. De Candole d. R.H. Whittaker

6. Halophiles means
   a. Some of the prokaryotes produce methane
   b. Some prokaryotes thrive in acidic environments and at high temperatures
   c. Few prokaryotes live in salty environments
   d. Some prokaryotes live in freshwater environments
7. Cavalier-Smith proposed _____ kingdom classification
   a. Three domains b. Five c. Six **d. Seven**
8. Origin of species book published by _____
   a. Charles Darwin b. John Ray c.Carl Woese d. Aristotle
9. The term species was coined by
   a.Charles Darwin **b. John Ray** c.Carl Woese d. Aristotle

2 Marks:

1. **What is Enaima and Anaima**
   Animals with blood is called Enaima, Animals without blood called Anaima
2. **Cladogram**
   The method of representing evolutionary relationship with the help of a tree diagram is known as cladogram
3. **Extremophiles**
   The prokaryotes which have the ability to grow in extreme conditions like volcano vents, hot springs and polar ice caps, hence are also called extremophiles
4. **Define species**
   Species is a group of animals having similar morphological features(traits) and is reproductively isolated to produce fertile offspring
5. **What is Binomial nomenclature?**
   The scientific name each organism has two components, a generic name and species name. This system of naming the organism is called Binomial nomenclature
6. **Tautonymy**
   - ❖ The practice of naming the animals in which the generic name and species name are the same
   - ❖ Ex. Naja naja(The Indian Cobra)
7. **DNA barcoding**
   DNA barcoding is short genetic marker in an organism's DNA to identify it as belonging to a particular Species
8. **Write two examples for ethology of taxonomical tools**
   1. Sound of birds 2. Bioluminescence

3 Marks:

1. **Define Taxonomy**
   Taxonomy is the science of arrangement of living organisms along with classification, description, identification and naming of organisms

2. **Differentiate Prokaryotes and Eukaryotes**
   - ❖ Prokaryotes organisms cells have no definite nucleus and DNA exists as a circular chromosomes an do not have histones associated with it
   - ❖ Eukaryotes are animals which have true nucleus and membrane bound organelles. DNA in the nucleus is arranged as a linear chromosomes with histone proteins
3. **Trinomial nomenclature**
   - ❖ When members of any species which have large variations then trinomial system is used
   - ❖ Organisms have three names : generic name, species name and sub-species name

5 Marks:

1. **The basic need for classifications**
   - ❖ To identify and differentiate closely related species
   - ❖ To know the variation among the species
   - ❖ To understand the evolution of the species
   - ❖ To create a phylogenetic tree among the different groups
   - ❖ To conveniently study living organisms
2. **Ruels of Nomenclature**
   - ❖ The scientific name should be italicized in printed from and if handwritten, it should be underlined Separately
   - ❖ The generic name's first alphapet should be in uppercase
   - ❖ The specific name of any two organisms are not similar
   - ❖ The scientific names of any two organisms are not similar
   - ❖ If the species name is framed after any person's name the name of the species shall end with i,ii,or ae

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CHAPTER 2. KINGDOM ANIMALIA

Book Back Questions :-

1. The symmetry exhibited in cnidarians is
   a.Radial b. Bilateral c. Pentamerous radial d. Asymmetrical
2. Sea anemone belongs to phylum
   a.Protozoa b. Porifera **c. Coelenterata** d. Echinodermata
3. The excretory cells that are found in platyhelminthes are
   a.Protonephridia **b. Flame cells** c. Solenocytes d. All of these
4. In which of the following organisms, self fertilization is seen.
   a.Fish b. Round worm c. Earthworm **d. Liver fluke**
5. Nephridia of Earthworms are performing the same functions as
   a.Gills of prawn **b. Flame cells of Planaria** c. Trachea of insects d. Nematoblasts of Hydra
6. Which of the following animals has a true coelom?
   a.Ascaris **b. Pheretima** c. Sycon d. Taenia solium
7. Metameric segmentation is the main feature of
   a.Annelida b. Echinodermata c. Arthropoda d. Coelenterata
8. In pheretima locomotion occurs with help of
   a.circular muscles b. longitudinal muscles and setae
   c. circular, longitudinal muscles and setae d. parapodia
9. Which of the following have the highest number of species in nature?
   a.Insects b. Birds c. Angiosperms d. Fungi
10. Which of the following is a crustacean?
    a.Prawn b. Snail c. Sea anemone d. Hydra
11. The respiratory pigment in cockroach is
    a. Haemoglobin b. Haemocyanin c. Oxyhaemoglobin **d. Haemoerythrin**
12. Exoskeleton of which phylum consists of chitinous cuticle?
    a.Annelida b. porifera **c. Arthropoda** d. Echinodermata
13. Lateral line sense organs occur in
    a. Salamander b. Frog c. Water snake **d. Fish**
14. The limbless amphibian is
    a. Icthyophis b. Hyla c. Rana d. Salamander
15. Four chambered heart is present in
    a. Lizard b. Snake c. Scorpion **d. Crocodile**
16. Which of the following is not correctly paired?
    a. Humans – Ureotelic b. Birds – Uricotelic
    c. Lizards – Uricotelic **d. Whale – Ammonotelic**
17. Which of the following is an egg laying mammal?
    a. Delphinus b. Macropus **c. Ornithorhynchus** d. Equus
18. Pneumatic bones are seen in
    a. Mammalia **b. Aves** c. Reptilia d. Sponges

19. Match the following columns and select the correct option.

Column – I	Column – II
(p) Pila	(i) Devil fish
(q) Dentalium	(ii) Chiton
(r) Chaetopleura	(iii) Apple snail
(s) Octopus	(iv) Tusk shell

a. p – (ii), q – (i), r – (iii), s – (iv) **b. p – (iii), q – (iv), r – (ii), s – (i)**
c. p – (ii), q – (iv), r – (i), s – (iii) d. p – (i), q – (ii), r – (iii), s – (iv)

20. In which of the following phyla, the adult shows radial symmetry but the larva shows bilateral symmetry?

a. Mollusca **b. Echinodermata** c. Arthropoda d. Annelida

21.Which of the following is correctly matched?

a. Physalia – Portugese man of war b. Pennatula – Sea fan
c. Adamsia – Sea pen d. Gorgonia – Sea anemone

22.Why are spongin and spicules important to a sponge?

- The sponges body is **supported** by a skeleton made up of calcareous and siliceous spicules or spongin or both.

23.What are the four characteristics common to most animals?

1. The arrangement of cell layer.
2. The levels of organisation - diploblastic /triploblastic organisation.
3. The patterns of symmetry-asymmetry, bilateral symmetry, radial symmetry.
4. Types of Coelom – acoelomates, pseudocoelomates, eucoelomates, and schizocoelomates.
5. The presence or absence of segmentation, notochord and organisation.

24.List the features that all vertebrates show at some point in their development.?

- They have notochord during embryonic stage, it replaced by cartilaginous or vertebral column in adult.
- They have paired appendages, and ventral muscular heart.

25. Compare closed and opened circulatory system:-

Open type circulatory system	Closed type circulatory system
The blood remains filled in tissue spaces due to the absence of blood capillaries. ex: arthropods, molluscs, and echinoderms.	The blood is circulated through blood vessels of- arteries, veins, and capillaries. ex: annelids, cephalochordates and vertebrates.

26.Compare Schizocoelom with enterocoelom:-

Schizocoelomates	Enterocoelomates
The body cavity of this animal is formed by splitting of mesoderm. ex: annelids, arthropods, molluscs.	The body cavity of this animal is formed by mesodermal pouches of archenteron. ex: Echinoderms, hemichordates and chordates.

27.Identify the structure that the archenteron becomes in a developing animal.

- ❖ In the process of gastrulation, the primary gut that is archenteron developing the embryo.
- ❖ Later it develops into the ectoderm and mesoderm of an animal.

28.Observe the animal below and answer the following questions

a. Identify the animal-**Adamsia (Sea anemone)**
b. What type of symmetry does this animal exhibit?-**Bilateral Symmetry**
c. Is this animal Cephalized?-**No**
d. How many germ layers does this animal have?-**2Layers(Diploblastic)**
e. How many openings does this animal's digestive system have? -One open only
f. Does this animal have neurons?–**Primitive Nervous Systems**

29.Choose the term that does not belong in the following group and explain why it doesnot belong? Notochord, Cephalization, dorsal nerve cord, and radial symmetry.

Ans:1.radial symmetry–is not belong in this group,because chordates are bilaterally symmetrical.

30.Why flatworms are called acoelomates?

- ❖ Flat worms are called acoelomate animals.They donot have a body cavity or coelom.
- ❖ In these animals their body is solid without a perivisceral cavity, this restricts the free movement of internal organs.

31.What are flamecells?

- ❖ Flatworms have Specialized excretory cells in flat worms.
- ❖ It helps in osmoregulation and excretion.

32.Concept Mapping-Use the following terms to create a concept map that shows the major characteristic features of the phylum nematoda:

Phylum:Nematoda/Aschelminthes

Roundworm

Coelom	Digestivetract	Cuticle	Nutrition	Reproduction
pseudocoelom	Complete alimentary canal	collagenous	parasite	Sexual dimorphism

33. ***In which phyla is the larva trochopore found?***

- ❖ Ans: Phylum Annelida and Mollusca

34.Which of the chordate characteristics do tunicates retain as adults?

- ❖ Dorsal tubular nerve cord is present only in the larval stage, dorsal ganglion is present in the adults.
- ❖ The heart is ventral and tubular.
- ❖ Respiration is through gill slits and clefts.

35.List the characteristic features that distinguish cartilaginous fishes with living jawless fishes:-

S.N	**Jawless fishex:**Lamprey, Hag fish	**Cartilaginous fish ex: s**hark, Stingray, Saw fish
1.	All are class–Cyclostomata. primitives.	All are class–Chondrichthyes.
2.	They are jawless, and mouth is circular and suctorial.	They have powerful jaws and located inventral side of the head.
3.	They are ectoparasites.	They are Predators.
4.	Respiration takes place 6-15 pairs of gill slits.	Respiration by lamelliform gills without operculum.
5.	They are oviparous, larvae- ammocoete	They are viviparous.

36.List three features that characterize bony fishes.

1. They are marine and freshwater living with bony endoskeleton and spindle shaped body.
2. Skin is covered by ganoid, cycloid or ctenoid scales.
3. Respiration is by four pairs of filamentous gills and is covered by an operculum on either side.

37.List the functions of air bladder in fishes.

- ❖ It helps in gaseous exchange in lung fishes.
- ❖ It is useful for maintaining the buoyancy in most of the ray fishes.

38.Write the characteristics that contributes to the success of reptiles on land.

1. They are mostly terrestrial animals and their body is covered by dry skin with epidermal scales.
2. They have three chambered heart but four chambered in crocodiles.
3. Reptiles lay **cleidoic eggs** with extra embryonic membranes like amnion, allantois, chorion and yolksac.
4. Excretion by metanephric kidneys and are uricotelic.
5. They are monoecious.Internal fertilization takes place and all are oviparous. Ex:Cobra, Turtle,, Crocodiles.

39.List the unique features of bird's endoskeleton.

- ❖ The endoskeleton of bird is fully ossified (bony).
- ❖ The long bones are hollow with air cavities (pneumatic bones).
- ❖ It helps to fly in air with low weight.

40.Could the number of eggs or young ones produced by an oviparous and viviparous female be equal?Why?

- ❖ The numbers of eggs produced by an oviparous and viviparous female be **not equal**. because:
- ❖ In oviparous animals, produced eggs to environmental conditions and are face several problem for predators, unfertilization, attack and then able to survive and produce young ones.
- ❖ On the other hand in viviparous animals,the development of young ones takes place in safe conditions inside the mother's body, and are less exposed to environmental conditions and predators.

Additional Questions:

- Cellular level organization is seen in sponges - **Sponges**
- Tissue level of organization is exhibited in _____ - **Cnidarians**
- The organ system level of organization first appears in the phylum ___ - **Platyhelminthes**
- Both radial and bilateral symmetry as seen in _____ - **Ctenophores**
- In Cnidaria stinging cells also called as _____ - **Nematocyst**
- Excretory organs of round worms(Aschelminthes) are _____ -**Renette glands**
- _____ is the largest phylum of the Kingdom Animalia - **Arthropoda**
- Marine fishes migrate to fresh waters for spawning is known as ____ - **Anadromous**
- In Aves,the oil gland otherwise called _____ at the base of the tail - **Preen gland**

Phylum names and their larva names:

Porifera – Prenchymula and Amphiblastula

Cnidaria – Planula larva

Ctenophora – Cydippid larva

Annelida – Trochophore larva

Mollusca – Veliger larva

Hemichordata- Tornaria larva

Choose the correct answers:

1. In sponges, _____ are maintain the size and structure
   a. Choanocytes b. Collar cells **c. Pinacocytes** d. Ostia
2. In sponges, _____ are facilitating respiratory and digestive functions
   a. Choanocytes b. Collar cells c. Pinacocytes d. Ostia
3. The simplest form of segmentation is found in _____
   a. Porifera b. Ctenophora **c. Annelids** d. Cnidaria
4. Bioluminescence characters seen in
   a. Porifera **b. Ctenophora** c. Annelids d. Cnidaria
5. Excretory organs of platyhelminthes
   a. Comb jellies b. Choanocytes c. Nematocyst **d. Flame cells**
6. _____ show high regeneration capacity
   a.Tape worm b. Cockroach **c. Planaria** d. Frog
7. Largest class in Kingdom Animalia
   a. Clitellata **b. Insecta** c. Amphibia d. Arachnid
8. _____ is used to test the purity of water and present in bivalves and gastropods
   a. Comb jellies b. Choanocytes c. Nematocyst **d. Osphraidium**
9. Tunicata are exclusively marine and are commonly called _____
   a. Acorn worms b. Tongue worms **c. Sea squirts** d. Jawed fishes
10. Kidneys of frog are _____
    a. Protonephridia **b. Mesonephric** c. Metanephric d. All the above

2 Marks:

1. **Differentiate incomplete digestive system and complete digestive system**
   - Animals having only a single opening to the exterior which serves as both mouth and anus called an incomplete digestive system
   - Animals having two openings, one for mouth and one for anus called as complete digestive system

2. **Triploblastic animals**
   Animals in which the developing has three germinal layers (outer ectoderm, middle mesoderm and inner endoderm) are called triploblastic animals
3. **Coelom**
   Most animals possess a body cavity between the body wall and the alimentary canal, and is lined with mesoderm
4. **Define metamerism**
   In some animals, the body is externally and internally divided into a series of repeated units called Segments with a serial repetition of some organs called metamerism
5. **What are the two taxonomic levels or grades of Eumetazoans**
   1. Radiata 2. Bilateria
6. **Hermaphrodites**
   An organism possessing both male and female reproductive organs testis and ovary respectively called hermaphrodites
7. **Name the two basic body forms of cnidaria**
   1. Polyp 2. Medusa
8. **Why ctenophore commonly called com jellies or sea walnuts?**
   Ctenophora have eight external rows of ciliated comb plates(comb jellies)which help in locomotion Hence commonly called comb jellies or sea walnuts
9. **Moulting or ecdysis**
   In Arthropods, body covered by chitinous exoskleleton for protection and to prevent water loss, It is Shed off periodically by a process called moulting or ecdysis.
10. **Respiratory organs of Arthrpodas**
    1. Gills 2. Book gills 3. Book lungs 4. Trachea
11. **Give two examples for organisms having powers of regeneration**
    1. Planaria 2. Star fish
12. **Write an example for Acoelomates, Pseudocoelomates, Schizocoelomates and Enterocoelomates**
    1. Acoelomates – Flat worms 2. Pseudocoelomates – Round worms
    2. Schizocoelomates – Annelids 4. Enterocoelomates _ Chordates

3 Marks:

1. **Differentiate radial symmetry and Bilateral symmetry**
   - When any plane passing through the central axis of the body divides an organism into two identical Parts, it is called radial symmetry
   - Animals which have two similar halves on either side of the central plane show bilateral symmetry
2. **Name the excretory organs of Arthropods**
   1. Malpighian tubules 2. Green glands 3. Coxal glands
3. **Write any three characters of flat worms**
   1. They are, mostly endoparasites of animals including human beings
   2. Hooks and suckers are present in the parasitic forms and serve as organs of attachment

3. Specialized excretory cells called flame cells help in osmoregulation and excretion
4. **Write the various mode of respiration in frog**
   1. Buccal respiration 2. Pulmonary respiration(lungs) 3. Cutaneous respiration(skin)
5. **Name the three types teeth in human beings**
   1. Thecodont 2. Diphyodont 3. Heterodont

5 Marks:

1. Write down the important characters of phylum Arthropoda

- This is the largest phylum of the Kingdom Animalia and includes the largest class called insect
- They have jointed appendages which are used for locomotion, feeding and sensory function
- Body is covered by chitinous exoskeleton for protection and to prevent water loss
- The body consists of a head ,thorax and abdomen with a body called haemocoel
- Circulatory system is of open type

2. General characters of chordates

1. Presence of elongated rod like notochord below the nerve cord and above the alimentary canal.In adult vertebrates, it may be partially or completely replaced by backbone or vertebral column
2. A dorsal hollow or tubular fluid filled nerve cord lies above the notochord and below the dorsal body wall it serves to integrate and co-ordinate the body functions
3. Presence of pharyngeal gill slits or cleft in all chordates at some stage of their life cycle.

3.Write any five important characters of Aves

1.The chacterstic feature of aves is the presence of features and the ability to fly except for flightless birds
2.The forelimbs are modified into wings,and the hind limbs are adapted for walking,perching etc.
3.The endoskeleton is fully ossified(bony) and hollow with air cavities(Pneumatic bones)
4. Aves are homeothermic. Urinary bladder absent
5. All birds are oviparous

4.Important characters of Mammalia

1. Their body is covered by hair, a unique feature of mammals
2. Presence of mammary glands is the most unique feature of mammals
3. External ears or pinnae are present
4. Their kidneys are metanephric and are ureotelic
5. All are homeothermic, sexes are separate and fertilization is internal

5.Differentiate Chordates and Non-chordates

	Chordates	Non chordates
1.	Notochord present.	Notochord is absent.
2.	Dorsal,hollow and single nerve cord.	Double ventral solid nerve cord.
3.	Pharynx perforated by gills lits.	Gill slits absent.
4.	Heart is ventrally placed.	Heart is dorsal or laterally placed.
5.	Apost anal tail is present.	Post anal tail is absent.
6.	Alimentary canal placed ventral to nerve cord.	Alimentary canal placed dorsal to nerve cord

Chapter – 3 . TISSUE LEVEL OF ORGANISATION

Book Back Questions :-

1. The main function of the cuboidal epithelium is
   a.Protection b. Secretion c. Absorption **d. Both (b) and (c)**
2. The ciliated epithelium lines the
   a.Skin b. Digestive tract c. Gall bladder **d. Trachea**
3. What type of fibres are found in connective tissue matrix?
   a.Collagen b. Areolar c. Cartilage d. Tubular
4. Prevention of substances from leaking across the tissue is provided by
   a.Tight junction **b. Adhering junction** c. Gap junction d. Elastic junction
5. Non-shivering thermogenesis in neonates produces heat through
   a.White fat b**. Brown fat** c. Yellow fat d. Colourless fat

6.Some epithelia are pseudostratified. What does this mean?

- These cells are columnar, and are unequal in size.
- It made up of single layered, yet it appears to be multi-layered because the nuclei lie at different levels indifferent cells.

7. Differentiate white adipose tissue from brown adipose tissue.

	White adipose tissue	Brown adipose tissue
1.	They are also found in subcutaneous tissue, surrounding the kidneys, eyeball, heart, etc. Adipose tissue is called **whiteadipose tissue**.	These tissue which contains abundant mitochondria is called **Brown adiose tissue**
2.	White fat stores nutrients	It is used to heat the blood stream to warm the body.

8. Why blood is considered as a typical connective tissue?

- It is a fluid connective tissue containing plasma, RBC,WBC and platelets.
- It functions as the transport medium for the cardiovascular system,carrying nutrients, wastes, respiratory gases throughout the body.

9 .Differentiate between elastic fibres and elastic connective tissue:-

Elastic fibre	Elastic connective tissue
It is found in the skin as the leathery dermis and forms fibrous capsules of organs such as kidneys, bones, cartilages, muscles, nerve and joints.	It contains high proportion of elasticfibres.It allows recoil of tissues following stretching. It maintains the pulsatile flow of blood through the arteries and the passive recoil of lungs following inspiration.

10.Name any four important functions of epithelial tissue and provide at least one example of a tissue that exemplifies each function

- The functions of epithelium includes **protection,absorption,filtration,excretion,secretion** and **sensory reception.**
  1. Absorption -Simple epithelium.
  2. Secretion - Columnar epithelium/Pseudo stratified epithelium.
  3. 3.Protection - Pseudo-stratified epithelium.

11. Write the classification of connective tissue and their functions:-

- It develops from the **mesoderm** and is widely distributed in the body.
- There are four main classes–**connective tissue**,**cartilage,bones** and **blood.**
- Major functions of connective tissues are **binding** and **support**, **protection**, **insulation** and **transportation** of substances.

12.What is an epithelium? Enumerate the characteristic features of different epithelia?

S.N	Epithelial tissue	Function	Found places
1.	Squamous	Diffusion and filtration	kidney, lungs, air sacs of lungs.
2.	Cuboidal	Secretion and absorption	Kidney tubules, ducts of small glands, ovary.
3.	Columnar	Absorption and lubricating	Micro villi, goblet cell.
4.	Ciliated	Mucus by Ciliary action	Small bronchioles, fallopian tubes, and uterus.

Additional Questions:

- The study of tissues is called is called - **Histology**
- _____ epithelium mostly found in the ducts of sweat glands and mammary glands - **Stratified cuboidal**
- Connective tissue develops from the _____ layer - **Mesoderm**
- _____ produces heat by non-shivering thermogenesis in neonates - **Brown fat**
- _____ are attach skeletal muscles to bones - **Tendons**
- _____ are attach one bone to another bone - **Ligaments**
- Most of the cartilages in vertebrate embryos are replaced by bone in adults - **Cartilage**
- The bone cells(osteocytes) are present in the spaces called _____ - **Lacunae**
- _____ , enhances night time vision in most of the animals like cat - **Tapetum lucidum**

Choose the correct Answers:

1. Based on the mode of secretion exocrine glands are classified as
   a. Merocrine b. Holocrine c. Apocrine **d. All the above**
2. _____ epithelium main function is to provide protection against chemical and mechanical stresses
   a. Simple **b. Compound** c. Glandular d. Neural tissue
3. _____ epithelium is found lining the ureters, urinary bladder and part of the urethra
   a. Columnar b.Alveolar c. Squamous **d. Transitional**

4. Connective tissue develops from the _____ layer
   a. Ectoderm b. Endoderm **c.Mesoderm** d. All the above
5. _____ tissue is similar to areolar tissue in structure and function and located beneath the skin
   a. Adipose tissue b. Osteocytes c. Chondrocytes d. Fibroblast
6. Specialized connective tissues
   a. Cartilage b. Bone c. Blood **d. All the above**
7. The Goblet cells are modifications of _____ epithelium
   a. Simple b. Cuboidal **c. Columnar** d. Squamous epithelium

2 Marks:

1.Tissues

Groups of cells that are similar in structure and perform common or related functions are called 'tissues'

2.What are four primary tissue types?

1. Epithelial tissue 2. Connective tissue 3. Muscle tissue 4. Nervous tissue

3.Tendons and Ligaments

- Tendons are attach skeletal muscles to bones
- Ligaments are attach one bone to another bone

4. Give two examples for Autoimmune connective tissue disorders

1. Rheumatoid arthritis 2. Sjogren's syndrome

5.Rheumatoid arthritis

- The immune cells attack and inflame the membranes around the joints
- It can also affect heart, lungs and eyes

6.What are 'living fabrics'

Tissues are organized in specific proportions and patterns to form organs like lung and heart hence the tissues are called the 'living fabrics'

7.Palmaris muscle

This long narrow muscle runs from the elbow to the wrist and is important for hanging and climbing in primates, is missing in 11% of humans today

3 Marks:

1. **Goblet cells**
   - Goblet cells present in Alimentary canal
   - They secretes the protective lubricating mucus
   - Their functions are absorption,secretion of mucus,enzymes and other substances

2. **Classify the exocrine glands based on the mode of secretion**
   1. Merocrine 2. Holocrine 3. Apocrine
2. **Name the three types of cell junctions**
   @ Tight junctions help to stop substances from leaking across a tissue
   @ Adhering junctions perform cementing to keep neighbouring cell together
   @ Gap junctions facilitate the cells to communicate with each other by connecting the cytoplasm of adjoining cells
3. **Name the three main classes of connective tissue**
   1. Loose connective tissue 2. Dense connective tissue 3. Specialized connective tissue
4. **What are specialized Connective Tissues?**
   1. Cartilage 2. Bones 3. Blood
5. **Myofibrils**
   Each muscle is made of many long, cylindrical fibres arranged in parallel arrays.These fibres are composed of numerous fine fibrils, called myofibrils
6. **Name the three types muscles**
   1. Skeletal 2. Smooth 3. Cardiac
7. **What is tissue fluid?**
   The Areolar connective tissue beneath the skin acts as a support framework for epithelium and acts as a reservoir of water and salts for the surrounding body tissues, hence aptly called tissue fluid
8. **Alzheimer's disease**
   @ It is a chronic neuro degenerative disease which includes the symptoms of difficulty in remembering recent events, problems with language, disorientation and mood swings

Chapter 4 ORGAN & ORGAN SYSTEMS IN ANIMALS

Book Back Questions : -

1. The clitellum is a distinct part in the body of earthworm Lampito mauritii, it is found in?
   a.Segments 13 – 14 **b. Segments 14 – 17** c. Segments 12 – 13 d. Segments 14 - 16
2. Sexually, earthworms are
   a.Sexes are separate **b. Hermaphroditic but not self -fertilizing**
   c.Hermaphroditic and self – fertilizing d. Parthenogenic
3. To sustain themselves, earthworms must guide their way through the soil using their powerful muscles. They gather nutrients by ingesting organic matter and soil, absorbing what they need intotheir bodies. True or False: The two ends of the earthworm can equally ingest soil.
   a.True **b. False**
4. The head region of Cockroach____ pairs of_____and _____shaped eyes occur.
   a. One pair, sessile compound and kidney shaped
   b. Two pairs, stalked compound and round shaped
   c. Many pairs, sessile simple and kidney shaped
   d. Many pairs, stalked compound and kidney shaped

5. The location and numbers of malpighian tubules in Periplaneta.
   a. At the junction of midgut and hindgut, about 150.
   b. At the junction of foregut and midgut, about 150.
   c. Surrounding gizzard, eight.
   d. At the junction of colon and rectum, eight.
6. The type of vision in Cockroach is
   a.Three dimensional b. Two dimensional **c. Mosaic** d. Cockroach do not have vision
7. How many abdominal segments are present in male and female Cockroaches?
   a. 10, 10 b. 9, 10 c. 8, 10 d. 9, 9
8. Which of the following have an open circulatory system?
   a.Frog b. Earthworm c. Pigeon d. Cockroach
9. Buccopharyngeal respiration in frog
   a.is increased when nostrils are closed b. Stops when there is pulmonary respiration
   c. is increased when it is catching fly **d. stops when mouth is opened.**
10. Kidney of frog is
    a. Archinephros b. Pronephros **c. Mesonephros** d. Metanephros
11. Presence of gills in the tadpole of frog indicates that
    a. fishes were amphibious in the past b. fishes involved from frog –like ancestors
    c. frogs will have gills in future **d. frogs evolved from gilled ancestor**
12. Choose the wrong statement among the following:
    a. In earthworm, a single male genital pore is present.
    b. Setae help in locomotion of earthworms.
    c. Muscular layer in the body wall of earthworm is made up of only circular muscles.
    d. Typhlosole is part of the intestine of earthworm.
13. Which of the following are the sense organs of Cockroach?
    a. Antennae, compound eyes, maxillary palps, anal cerci
    b. Antennae, compound eye, maxillary palps
    c. Antennae, ommatidia, maxillary palps, sternum
    d. Antennae, eyes, maxillary palps, and tarsus of walking legs.

14) What characteristic are used to identify the earthworms?

- It has a long and cylindrical narrow body,which is **bilaterally symmetrical.**
- **Light brown** in colour,with purplish tinge at the anterior end.
- The earthworms is encircled by divides in to a segments or **metameres**.
- Segments14to17may be found glandular thickening of **clitellum** present.

15) What are earthworm casts ?

- The undigested particles along with earth are passed out through the anus,as **wormcasting or vermicasts.**

16) How do earthworms breathe?

- Respiration takes places through the **body wall.**
- The outer surface of the skin is richly supplied with blood capillaries,which aid in the **diffusion of gases**.
- **Oxygen** diffuses through the skin into the blood,while CO_2 from the blood diffuses out.

17) Why do you call cockroach a pest?

- ❖ They carry with them **harmful germs** of various bacterial diseases like cholera,diarrhoea,tuberculosis,and typhoid and hence are known as„ **Vectors" .**

18) Comment on the functions of alary muscles?

- ❖ The triangular muscles that are **responsible for blood circulation** in the cockroach.
- ❖ One pair of the muscles is found in each**(13)segment** on eitherside of the heart.

19) Name the visual units of the compound eyes of cockroach.?

- ❖ The head capsule bears a pair of large,sessile,and reniform **compound eyes**.
- ❖ Each eye is formed of about 2000 simple eyes called the **ommatidia.**
- ❖ The cockroach can **receive several images** of an object through ommatidia.

20) How does the male frog attracts the female for mating(or)The difference between male and female frog?

- ❖ The male frog has a pair of **vocalsacs**,and are assist in amplifying the **croaking sound** of frog.
- ❖ In male has a copulatory or **nuptialpad** on the ventral side of the first digit of each fore limb.
- ❖ Vocalsacs and nuptial pad are **absent in the female** frog.

21) Write the types of respiration seen in frog?

1. **Cutaneous respiration**–in water,**skin acts** as a aquatic respiratory organ.
2. **Buccal respiration**–on land,the **buccal cavity** is alternately raise and lowered.
3. **Pulmonaryrespiration**–onland,respiration by **lungs** present in the upper part of the trunk region.

22) Differentiate between peristomium and prostomium in earthworm?

i. **Peristomium**–the **first segment**,mouth is found in the centre.
ii. **Prostomium**–a small **flap over hanging** the mouth,it is also called upperlip

23) Give the location of clitellum and spermathecal openings in *Lampitomauritii*?

1. **Clitellum**–a glandular thickening of the skin present in between **14-17** segments.
2. **Spermathecal openings**–3pairs,ventrolateral opening,lying between **6/7,7/8,**and **8/9**segments.

24) Differentiate between tergum and sternum?

a) **Tergum**–cockroach have10 abdomen segments,each segments is covered by the **dorsal** tergum.
b) **Sternum**-cockroach 10 abdomen segments all are covered by the **ventral** sternum.

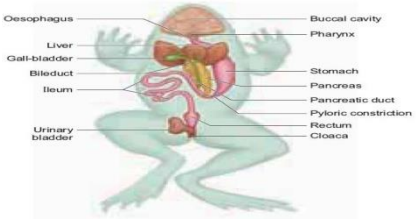
25) Head of cockroach is called hypognathous.Why?

- ❖ The head of cockroach is small,**triangular** lies at right angle to the longitudinal body axis.
- ❖ The mouth parts are **directed downwards** so it is **hypognathous.**

26) What are the components of blood in frog?

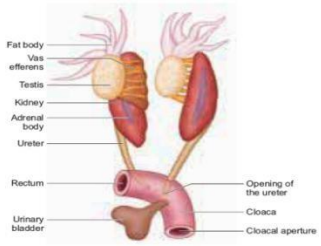
- ❖ The blood consists of plasma-60%,and blood cells-40%,RBC,WBC,and platelets.
- ❖ RBCs are loaded with red pigment,nucleated and oval in shape.
- ❖ Leucocytes are nucleated,and circular in shape.

27) Draw a neat labelled diagram of the digestive system of frog?



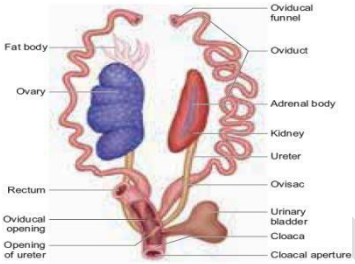
28) Explain the male reproductive system of frog?

- It has a pair of testis,which are attached to the kidney and the dorsal body wall by folds of **peritonium** called **mesorchium.**
- **Vasaefferentia** arise from each testis.
- They enter the kidneys on both side and open into the bladder canal.
- Finally,it communicates with the urinogenital duct,that comes out of kidneys and opens into the **cloaca.**



29) Explain the female reproductive system of frog?

- It consists of paired **ovaries,**attached to the kidneys,and dorsal body wall by folds of **peritoneum** called **mesovarium.**
- There is a pair of coiled **oviducts** lying on the sides of the kidneys.
- Each oviduct opens into the bodycavity at the anterior end by a funnel like opening called **ostia.**
- Posteriorly the oviducts dilated to form **ovisacs** before they open into cloaca.



30) Differentiate between male and female cockroach?

Table 4.2: Differences between male and female cockroach

S. No	Character	Male cockroach	Female cockroach
1.	Abdomen	Long and narrow	Short and broad
2.	Segments	In the abdomen, nine segments are visible	In the abdomen, seven segments are visible
3.	Anal styles	Present	Absent
4.	Terga	7^{th} tergum covers 8^{th} tergum	7^{th} tergum covers 8^{th} and 9^{th} terga
5.	Brood pouch	Absent	Present
6.	Antenna	Longer in length	Shorter in length
7.	Wings	Extends beyond the tip of abdomen	Extends up to the end of abdomen

Additional Questions:

- _____ refers to the study of form or externally visible features - **Morphology**
- _____ is used for the study of internal organs in the animals - **Anatomy**
- Colour of earthworm is mainly due to the presence of pigment - **Porphyrin**
- First segment of the earthworm called the _____ - **Peristomium**
- In earthworm, the mouth region is a small flap called upper lip or _____ -**Prostomium**
- the last segment of the earthworm has anus called the _____ - **Pygidium**
- In each segment of cockroach, exoskeleton has hardened plates called____ - **Sclerites**
- The tongue of cockroach otherwise called _____ - **Hypognathous**
- _____ membrane protects the eye when the frog is under water - **Nictitating membrane**
- Heart of frog is _____ chambered - **3**
- In cockroach, exchanges of gases takes place through _____ - **Haemolymph**
- In frog ,the medulla oblongata passes out through the _____ and continues as spinal cord - **Foramen magnum**
- In earthworm _____ serves as a hydrostatic skeleton -**Coelomic fluid**
- In earthworm the _____ are known to play a major role in regeneration - **Coelomocytes**

Choose the correct Answewrs:

1. In earthworm _____ helps in the formation of the cocoon
   a. Peristomium b. Prostomium c.Pygidium **d. Clitellum**
2. In earth worm locomotion role performed by _____
   a. Peristomium b. Prostomium **c.Body setae** d. Clitellum
3. In earthworm, respiration takes place through the _____
   a. Clitellum **b. Body wall** c. Typhosole d. Gizzard
4. In earthworm, two pairs of seminal funnels called _____
   a. Ciliary rosettes b. Vas deferentia c. Penial setae d. Oviducts
5. Incupation period cocoon
   a. 10-13 b. 13-17 **c. 14-18** d. 15-18
6. In earthworm _____ develops at the end of growth phase
   a. Ciliary rosettes **b. Clitellum** c. Juveniles d. Cocoon
7. The life cycle of Lampito mauritii takes about _____ days to complete
   a. 30 b. 40 c. 45 **d. 60**
8. Cockroach mouth parts are ____ and ___ type
   a. Sucking and chewing **b. Biting and chewing** c. Licking and biting d. Sucking and biting
9. _____ is the smallest one leg of the cockroach
   a. Coxa b. Femur c.Tibia **d. Trochanter**
10. The nymph grows by moulting or ecdysis about _____ times to reach the adult form
    a. 5 **b. 13** c. 8 d. 10
11. The _____ allergen can cause asthma to sensitive people
    a. Frog b. Salamander c. Penguin **d. Cockroach**
12. The _____ are the main excretory organs of cockroach
    a. Green glands b. Coxal glands **c. Malpighian tubules** d. Radula

2 Marks:

1. **Why do the earthworms considered as "friends of farmers"**
   In gardens, earthworms can be traced by their faecal deposits known as worm castings on the soil surface. So, earthworms are considered as "friends of farmers"
2. **Metemeres**
   The body of the earthworm is encircled by a large number of grooves which divides into a number of compartments called segments or metameres
3. **Clitellum**
   In mature earthworms , segments 14 to 17may be found swollen with a glandular thickening of the skin called the Clitellum
4. **Typhlosole**
   In earthworms, the dorsal wall of the intestine is folded into the cavity as the typhosole
5. **Elytra or Tegmina**
   Forewings of cockroach arise from mesothorax,protects the body when at rest called elytra or tegmina
6. **Stigmata**
   In respiratory system of cockroach,branched tubes known as trachea open through 10 pairs of small holes called spiracles or stigmata
7. **Name the two types of frog**
   1. Maxillary teeth 2. Vomerine teeth
8. **Name the two meninges of brain of frog**
   1. Piamater 2. Duramater
9. **Differentiate male frog and female frog**
   - In male frog a pair vocal sacs and a nuptial pad in fore limb present
   - In female frog Vocal sacs and nuptial pad absent
10. **What is nictitating membrane? What is it use?**
    - In frog third transparent eyelid called nictitating memebrane
    - This membrane protects the eye when frog is under water
11. **What is Ommatidia?**
    In cockroach, each eye is formed of about 2000 simple eyes called the ommatidia through which the Cockroach can receive several images of an object

3 Marks:

1. **What is epigeics, anecics and endogeics classification of earthworm**
   - Epigeics ("up on the earth") are surface dwellers
   - Anecics ("outer layer of the earth") are found in upper layers of the soil
   - Endogeics('within the earth") are found in deeper layers of the soil
2. **Name the various receptors of earthworm**
   1. Photoreceptors(sense of light) 2. Gustatory(taste) 3. Olfactory(smell)
   4. Tactile (touch) 5. Chemoreceptros(detect chemical changes) 6.Thermoreceptors(temperature)
3. **Nephrostome**
   - In excretory system of earthworm, Meganephridium has internal funnel like opening called the Nephrostome which is fully ciliated

4. **Chloragogen cells and its role**
   - ❖ In earthworms, besides nephridia, special cells on the coelomic wall of the intestine,called Chloragogen cells are present
   - ❖ They extract the nitrogenous waste from the blood of the intestinal wall into the body cavity to be Sent out through the nephridia
5. **Malpighian tubules and its functions**
   - ❖ In cockroach, hindgut is marked by the presence of 100-150 yellow coloured thin filamentous structures called malpighian tubules
   - ❖ They are helpful in removal of the excretory products from the haemolymph

5 Marks:

1. **Life cycle of lampito mauritii(Earthworm)**
   - ❖ Lampito mauritii begins its life cycle from the fertilized eggs
     These eggs are held in a protective cocoon. These cocoon have an incubation period of about 14-18 days after which they hatch to release juveniles
   - ❖ The juveniles undergo changes into non-clitellate forms in phase-I after about 15 days,which then develops a clitellum, called the clitellate at the end of the growth phase II taking 15-17 days to complete
   - ❖ During the reproductive stage, earthworms copulate, and later shed their cocoon in the soil after about 10 days
   - ❖ The life cycle of earthworm takes about 60 days to complete

Chapter 5. DIGESTION AND ABSORPTION

Book Back Questions :-

1. Choose the incorrect sentence from the following:
   a. Bile juice emulsifies the fat.
   b. Chyme is a digestive acidic food in stomach.
   c. Pancreatic juice converts lipid into fatty acid and glycerol.
   d. **Enterokinase stimulates the secretion of pancreatic juice.**
2. What is chyme….?
   a. The process of conversion of fat in to small droplets.
   b. The process of conversion of micelles substances of glycerol into fatty droplet.
   c. **The process of preparation of incompletely digested acidic food through gastric juice.**
   d. The process of preparation of completely digested liquid food in midgut.
3. Which of the following hormones stimulate the production of pancreatic juice and bicarbonate?
   a. Angiotensin and epinephrine b.Gastrin and insulin
   c.Cholecysokinin and secretin d.Insulin and glucagon
4. The sphincter of Oddi guards
   a.Hepatopancreatic duct b.Common bile duct
   c.Pancreatic duct d.Cystic duct
5. In small intestine, active absorption occurs incase of
   a. Glucose b.Amino acids c.Na+ **d.All the above**

6. Which one is incorrectly matched?
a.Pepsin–stomach **b.Renin– liver** c.Trypsin–intestine d.Ptyalin– mouth

7. Absorption of glycerol, fatty acids and monoglycerides takes place by
a.Lymph vessels within villi b.Walls of stomach c.Colon d.Capillaries within villi

8. First step in digestion of fat is
a.Emulsification b.Enzyme action c.Absorption by lacteals d.Storage in adipose tissue

9. Enterokinase takes part in the conversion of
a.Pepsinogen into pepsin **b.Trypsinogen into trypsin**
c.Protein into polypeptide d.Caseinogen into casein

10. Which of the following combinations are not matched?

Column I	Column II
a. **Bilirubin and biliverdin**	**(i) intestinal juice**
b.Hydrolysis of starch	(ii) Amylases
c. Digestionof fat	(iii)Lipases
d. Salivary gland	(iv)Parotid

11. Match column I with column II and choose the correct option

Column – I	Column – II
(P) Small intestine	(i)Largestfactory
(Q) Pancreas	(ii)AbsorpstionofGlucose
(R) Liver	(iii)Carryingelectrolyticsolution
(S) Colon	(iv)Digestionandabsorption

a.(P-iv)(Q-iii)(R-i)(S–ii) b.(P-iii)(Q-ii)(R- i)(S–iv)
c.(P-iv)(Q-iii)(R- i)(S–ii) d.(P-ii)(Q-iv)(R- iii)(S–i)

12. Match column I with column II and choose the correct option

Column – I	Column – II
(P) Small intestine	(i) 23cm
(Q) Largeintestine	(ii)4meter
(R) Oesophagus	(iii)12.5cm
(S) Pharynx	(iv)1.5meter

a.(P-iv)(Q-ii)(R-i)(S–iii) **b.(P-ii)(Q-iv)(R-i)(S–iii)**
c.(P-i)(Q-iii)(R-ii)(S–iv) d.(P-iii)(Q-i)(R-ii)(S–iv

13.Match column I with column II and choose the correct option

Column - I	Column – II
(P) Lipase	(i) Starch
(Q) Pepsin	(ii) Cassein
(R) Renin	(iii) Protein
(S) Ptyalin	(iv) Lipid

a. (P-iv) (Q -ii) (R- i) (S – iii) b. (P-iii) (Q -iv) (R- ii) (S – i)
c. (P-iv) (Q -iii) (R- ii) (S – i) d. (P-iii) (Q -ii) (R- iv) (S – i)

14.Which of the following is not the function of liver?
a. Production of insulin b. Detoxification c. Storage of glycogen d. Production of bile

15 Assertion : (A) Large intestine also shows the presence of villi like small intestine.
Reason: (B) Absorption of water takes place in large intestine.

a. Both A and B are true and B is the correct explanation of A
b. Both A and B are true but B is not the correct explanation of A
c. A is true but B is false
d. A is false but B is true

16.Which of the following is not true regarding intestinal villi?

a. They possess microvilli.
b. They increase the surface area.
c. They are supplied with capillaries and the lacteal vessels.
d.They only participate in digestion of fats.

17. **Why are villi present in the instestine and not in the stomach?.**

- ❖ In stomach the digestive process not complete, and also the food cannot converted into macromolecules to monomeric units.
- ❖ Absorption and assimilation process cannot takes places in the stomach region.
- ❖ So these are reasons villi are present in the stomach.

18. **Bile juice contains no digestive enzymes, yet it is important for digestion.why?**

It does not contains digestive enzymes, but it have Bile salts, cholesterol, and phospholipids.
It helps:-

1. Bile helps in emulsification of fats.
2. Bile salts reduce the surface tension of fat droplets and break them into small globules.
3. Bile also activates lipases to digest lipids.

19. **List the chemical changes that starch molecule undergoes from the time it reaches the small intestine.**

1.	Carbohydrates		monosaccharides(glucose,fructose,galactose).
2.	Maltose	Maltase	glucose+glucose
3.	Sucrose	Sucrase	glucose+fructose
4.	Lactose	Lactase	glucose+galactose

20. **How do proteins differ from fats in their energy value and their role in the body?**

1. Protein–Caloricvalue–5.65Kcal,and a Physiological fuelvalue-4 Kcal.+
2. Fat–Caloricvalue–9.45Kcal ,and a Physiological fuelvalue-9Kcal.+

21. **Digestive secretions are secreted only when needed. Discuss.?**

- ❖ Sight,Smell,Taste as well as the mechanical stimulation of food in the mouth, triggers a reflex action which results in the secretion of saliva.
- ❖ The mechanical digestion starts in the mouth by grinding and chewing of food.
- ❖ The passage of food into the stomach, Duodenum, and small intestine, stimulate the secretions and there by facilitate digestion.

Additional Questions:

- ❖ It acts as universal tooth brush **- Tongue**
- ❖ _____ prevents the entry of food into the glottis during swallowing **- Epiglottis**
- ❖ _____ is the longest part of the alimentary canal **- Small intestine**
- ❖ Digestive glands are exocrine glands which secretes biological catalysts called _ **- Enzymes**

- The daily secretion of saliva from salivary glands ranges from ____ to ____ **- 1000 to 1500ml**
- Hcl secreted by the parietal cells or **- Oxynctic cells**
- The largest gland in our body **- Liver**
- _____ is the second largest gland **- Pancreas**
- The calorie value of carbohydrate is _____ Kcal per gram **- 4.1**
- The calorie value of fat is _____ Kcal per gram **- 9.45**
- The calorie value of protein is _____ Kcal per gram **- 5.65**
- Degree of obesity is assessed by _____ **- BMI**
- A normal BMI range for adult is _____ **- 19-25**
- The enzyme Salivary amylase otherwise called _____ **- Ptyalin**
- In saliva _____ act as antibacterial agent **- Lysosyme**

Choose the correct Answer:

1. In the alimentary canal _____ is 'U' shaped
   a. Stomach **b. Duodenum** c. Small intestine d. Sigmoid colon
2. _____ are large in herbivorous animal, for cellulose digestion
   a.Caecum b. Colon c. Vermiform appendix **d. Both a and c**
3. Wall of the alimentary canal consists of _____ layers
   a.2 b. 3 **c. 4** d. 5
4. Number of salivary glands in the mouth
   a.4 b. 3 c. 2 pairs **d. 3 pairs**
5. _____ has high power of regeneration
   a.Liver b. Pancreas c. Villi d. Large intestine
6. _____ is consisting of exocrine and endocrine cells
   a.Gut b. Salivary glands **c. Pancreas** d. Liver
7. _____ are the breakdown products of haemoglobin of dead RBCs,
   a.Bile salts **b. Bile pigments** c. Cholestrol d. Chyme
8. This enzyme secretion gradually reduces with aging
   a. Trypsin b. maltase c. sucrase **d. Rennin**
9. Each tooth is embedded in a socket in the jaw bone called_____
   a.Thecodont b. Heterodont c. Diphyodont d. Homodont
11. We obtain _____ % energy from proteins
   a.35 **b. 15** c. 50 d. 70
10. Largest salivary glands
   a.Parotids b. Sub-maxillary/Sub-mandibular 3. Sublingual d. Sub-mucosa

2 marks

1. **What are the steps involves in the process of digestion?**
   1. Ingestion 2. Digestion 3. Absorption 4. Assimilation 5. Egestion
2. **Human the dental formula**
   2123
   ------ +2
   2123

3. **Epiglottis**
   A cartilaginous flap called epiglottis prevents the entry of food into the glottis(opening of trachea) during swallowing.

4. Name the four layers of alimentary canal

1. Serosa 2. Muscularis 3. Sub-mucosa 4. Mucosa

5. What are bile pigments?

1. Bilirubin 2. Biliverdin

6. Define Glisson's capsule

Each lobe of liver has many hepatic lobules is covered by a thin connective tissues sheath called the Glisson's capsule.

7. What is peristalsis?

The bolus further passes down through the oesophagus to the stomach by successive waves of muscular contraction called peristalsis

8. Chylomicrons

In the small intestine micelles are absorbed into the intestinal mucosa where they are re-synthesized into protein coated fat globules called chylomicrons.

9. Name the two disease caused by protein deficiency(OR) Protein Energy Malnutrition(PEM)

1. Marasmus 2. Kwashiorkar

10. Body Mass Index(BMI)

BMI is calculated as body weight in kg,divided by the square of body height in meters

11.Define Gall stones

Any alternation in the composition of the bile can cause the formation of stones in the gall bladder

3 Marks:

1. **What do you mean by Diphyodont?**
   Human beings and many mammals form two sets of 20 temporary milk teeth which gets replaced by a set of 33 permanent teeth.
2. **GERD (Gastero Oesophagus Reflex Disorder)**
   If the cardiac sphincter does not contract properly during the churning action of the stomach the gastric juice with acid may flow back into the oesophagus and cause heart burn, resulting in GERD
3. **Write the names of Salivary glands**
   1. Parotids 2. Sub-maxillary 3. Sublingual
4. **Chyme**
   Food remains in the stomach for 4 to 5 hours the rhythmic peristaltic movement churns and mixes the food with gastric juice and make it into a creamy liquid called chyme.
5. **Colitis**
   - ❖ Intestinal tract is more prone to bacterial,viral and parasitic worm infections
   - ❖ This infection may cause inflammation of the inner lining of colon called colitis
6. **Obesity**
   - ❖ It is caused due to the storage of excess of body fat in adipose tissue
   - ❖ It may induce hypertension, artherosclerotic heart disease and diabetes
   - ❖ Obesity may be genetic or due to excess intake of food, endocrine and metabolic disorders

5 marks

1. **Write Liver functions apart from bile.**
   - ❖ Destroys aging and defective blodd cells
   - ❖ Stores glucose in the form of glycogen or disperses glucose into the blodd stream with the help of
   - ❖ pancreas hormones
   - ❖ Stores fat soluble vitamins and iron
   - ❖ Detoxifies toxic substances
   - ❖ Involves in the sysnthesis of non-essential amino acids and urea.

Chapter 6. RESPIRATION

Book Back Questions :-

1. Breathing is controlled by
   a. cerebrum **b. medulla oblongata** c. cerebellum d. pons
2. Intercostal muscles are found between the
   a. vertebral column b. sternum **c. ribs** d. glottis
3. The respiratory structures of insects are
   a.tracheal tubes b. gills c. green glands d. lungs
4. Asthma is caused due to
   a.bleeding in pleural cavity. b. infection of nose c. damage of diaphragm. **d. infection of lungs**
5. The Oxygen Dissociation Curve is
   a.sigmoid b. straight line c. curved d. rectangular hyperbola
6. The Tidal Volume of a normal person is
   a. 800 ml b. 1200 ml **c. 500 ml** d. 1100 – 1200 ml
7. During inspiration, the diaphragm
   a.expands. b. unchanged c. relaxes to become domed–shaped **d. contracts and flattens**
8. CO_2 is transported through blood to lungs as
   a.carbonic acid b. oxyhaemoglobin **c. carbamino haemoglobin** d. carboxy haemoglobin
9. When 1500 ml air is in the lungs, it is called
   a.vital capacity b. tidal volume c. residual volume d. inspiratory reserve volume
10. Vital capacity is
    a.TV + IRV b. TV + ERV c. RV + ERV **d. TV + TRV + ERV**
11. After a long deep breath, we do not respire for some seconds due to
    a. more CO_2 in the blood **b. more O_2 in the blood** c. less CO_2 in the blood d. less O_2 in the blood
12. Which of the following substances in tobacco smoke damage the gas exchange system?
    a. carbon monoxide and carcinogens b. carbon monoxide and nicotine
    c. carcinogens and tar d. nicotine and tar
13. Column I represents diseases and column II represents their symptoms. Choose the correctly paired option

Column I	Column II
(P) Asthma	(i) Recurring of bronchitis
(Q) Emphysema	(ii) Accumulation of W.B.CS in alveolus
(R) Pneumonia	(iii) Allergy

a. P = iii, Q = ii, R = i b. P = iii, Q = i, R = ii c. P = ii, Q = iii, R = i d. P = ii, Q = i, R = iii

14. Which of the following best describes the process of gas exchange in the lungs?
    a. Air moves in and out of the alveoli during breathing.
    b. Carbon dioxide diffuses from deoxygenated blood in capillaries into the alveolar air.
    c. Oxygen and carbon dioxide diffuse down their concentration gradients between blood and alveolarair.
    d. Oxygen diffuses from alveolar air into deoxygenated blood.

15. Make the correct pairs.

Columan–I	Column–II
(P) IC	- i. maximum volume of air breathe in after forced.
(Q) EC	- ii. Volume of air present after expiration in lungs.
(R) VC	- iii. Volume of air inhaled after expiration.
(S) FRC	- iv. Volume of air exhaled after inspiration.

(a) P – i , Q – ii , R – iii , S – iv (b) P – ii , Q – iii , R – iv , S – i

(c) P – ii , Q – iii , R – i , S – iv **(d) P – iii , Q – iv , R – i , S – ii**

16. Make the correct pairs.

Columan–I	Column–II
P. Tidal volume	i. 1000 to 1100 ml
Q. Residual volume	ii. 500 ml
R. Expiratory reserve volume	iii. 2500 to 3000 ml
S. Inspiratory reserve volume	iv. 1100 to 1200 ml

a. P – ii , Q – iv , R – i , S – iii (b) P – iii , Q – ii , R – iv , S – i

c. P – ii , Q – iv , R – iii , S – I (d) P – iii , Q – iv , R – i , S – ii

17.Name the respiratory organs of flatworm, earthworm, fish prawn, cockroach and cat.

1. Flatworm -Body surface
2. Earthworm -Body wall
3. Fish - Gills
4. Prawn - Gills
5. Cockroach -Trachea
6. Cat -Lungs

18. Name the enzyme that catalyses the bicarbonate formation in RBCs.

Ans:Carbonic anhydrase.

19.Air moving from the nose to the trachea passes through a number of structures.

List in order of the structure.

Externalnostrils→ nasalcavity→ pharynx→ larynx→ trachea→ bronchi→ bronchioles→ lungs.

20.Whichstructuresealsthelarynxwhenweswallow?

- ❖ During swallowing a thin elastic flap called epiglottis prevents the food from entering in to the larynx and avoids choking of food.

21. Resistance in the airways is typically low.why?Give two reasons.?

- ❖ Bronchi have"C"shaped curved cartilage plates to ensure that the air passage does not collapse or burst as the ear pressure changes during breathing
- ❖ The bronchioles are without cartilaginous rings and have rigidity that prevent them from collapsing but are surrounded by smooth muscle which contracts or relaxes to adjust the diameter of these airways.

22. How the body makes long-term adjustments when living in high altitude?

- ❖ When a person travels quickly from sea level to elevations above 8000ft,where the atmospheric pressure and partial pressure of oxygen are lowered.
- ❖ The individual responds with symptoms of acute mountain sickness(AMS)–headache,shortness of breath, nausea and dizziness due to poor binding of O_2 with haemoglobin.
- ❖ When the person moves on a long–term basis to mountains from sea level is body begins to

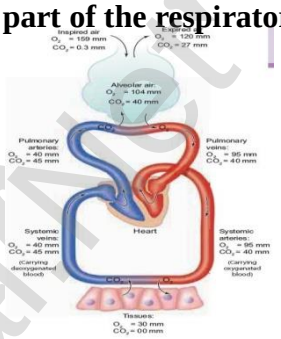
make respiratory and haematopoietic adjustments.

- To over come this situation kidneys accelerate production of the hormone erythropoietin,which stimulates the bone marrow to produce more RBCs.

23.Why is pneumonia considered a dangerous disease?

- **Pneumonia-**Inflammation of the lungs due to infection caused by bacteria or virus is called pneumonia.
- The common symptoms are sputum production, nasal congestion, shortness of breath, sore throat, etc.

24.Diffusion of gases occur in the aveolar region only and not in any other part of the respiratory system. Discuss.



- The primary site for the exchange of gases is the alveoli.
- The uptake of $O_2$and the release of CO_2 occur between the blood and tissues by simple diffusion driven by partial pressure gradient of $O_2$and CO_2.
- Partial pressure is the pressure contributed by an individual gas in a mixture of gases.
- It is represented as pO_2 for oxygen and pCO_2 for carbon–dioxide.
- Due to pressure gradients, O_2 from the alveoli enters into the blood and reaches the tissues.
- CO_2enters into the blood from the tissues and reaches alveoli for elimination.
- As the solubility of CO_2 is 20–25 times higher than that of O_2, the partial pressure of CO_2 is much higher than that of O_2.

25.Sketch a flow chart to show the path way of air flow during respiration?

Nose → Nasal & Oral cavities → Pharynx → Larynx → Trachea → Bronchi → Secondary bronchi → Tertiary bronchi→ Smallar bronchi→ Bronchioles→ Terminalbronchiole → Respiratorybronchiole → Alveoli→ Alveoli walls.

26. Explain the conditions which creates problems in oxygen transport.?

- When a person travels quickly from sea level to elevations **above8000 ft.**
- Where the atmospheric pressure and partial pressure of **oxygen are lowered.**
- The individual responds with symptoms of **Acutemountainsickness(AMS)**–headache, shortness of breath, nausea and dizziness due to poor binding of **O_2**with haemoglobin.
- When a person descends deep into the sea,the pressure in the surrounding water increases which causes the lungs to decrease in volume.
- This decrease in volume increases the partial pressure of the gases with in the lungs.
- This effect can be the increased pressure can also driven it nitrogen gas into the circulation. It can lead to a condition called **nitrogen narcosis.**
- Which leads to blocking blood flow or can press on nerve endings.
- Decompression sickness is associated with pain in joints and muscles and neurological problems including stroke.

Additional Questions:

- **The Lungs are covered by the double walled membrane is _____ - Pleura**
- **A healthy human breathes _____ times/minute - 12-16**
- **The primary site for the exchange of gases is the _____ - Alveoli**
- **Molecular weight of Hemoglobin is _____ - 68000 Daltons**
- **Respiratory centre or Respiratory rhythm centre is _____ - Medulla oblongata**
- **The risk of _____ is common is scuba divers - Nitrogen narcosis**
- **Collection of fluid between the lungs chest wall is the**
- **main complication of _____ disease - Tuberculosis**
- **An Instrument is used to measure the volume of air - Spiro meter**
- **Widening of the alveoli is called _____ - Emphysema**
- **A common manifestation of allergy is _____ - Asthma**
- **Pneumotaxic centre present in _____ region of the brain - Pons varoli**
- **Total lung capacity(TLC) is approximately - 6000 ml**
- **Dead space amounts to approximately - 150 ml**
- **Hemoglobin belongs to the class of - Conjugated protein**
- **Tuberculosis is caused by_____ - Mycobacterium tuberculae**

Choose the correct Answer:

1. Respiratory zones
   a. **Alveoli and ducts** b. External nostrils c. Bronchioles d. Pharynx
2. The _____ epithelial cells lining the trachea
   a. Flagellated b. Columnar c. Squamous **d. Ciliated**
3. _____ epithelial cells present in the alveoli
4. **a.** Flagellated b. Columnar **c. Squamous** d. Ciliated
5. Use of _____ is being recommended by pollution control board to reduce particulate pollution
   a. Diesel b. Petrol c. Gasoline **d. CNG**
6. Inflammation of the lungs due to infection by bacteria or virus is _____
   a. Asthma b. Emphysema c. Bronchitis **d. Pneumonia**
7. Tuberculosis is caused by _____
   a. Virus b. Fungus **c. Bacteria** d. Protozoa
8. _____ infection mainly occurs in the lungs and bones
   a. **Tuberculosis** b. Stroke c. Pneumonia d. Asbestosis
9. The partial pressure of O2 in the oxygenated blood is _____ mmHg
   a. 40 b. 45 **c. 95** d. 104
10. _____ does not bind with O2
    a. Haemoglobin **b. Methaemoglobin** c. Oxyhaemoglobin d. All the above
11. _____ is not involved in gaseous exchange
    a. Alveoli b. Trachea c. Branchioles **d. Dead space**
12. The tracheal tube of human is supported by
    a. Epiglottis b. Glottis **c. Cartilaginous rings** d. Pleura
13. The _____ lack cartilaginous rings
    I.Trachea II. Bronchi III. Bronchioles IV. Alveoli
    a. I and IV b. I and II c. II and III **d. III and IV**

14. When we go to hilly areas the kidney accelerates production of
a. Erythropoietin b. Adrenalin c. Nor adrenalin d. None of these

15. Normally RBC contains less than _____ % methaemoglobin
a. 4 b. 6 c. 2 **d. 1**

2 marks:

1. **Define Respiration**
The term respiration refers to the exchange of oxygen and carbondioxide between environment and cells
2. **Name the two zones of human respiratory system**
1. Conducting zone 2. Respiratory zone
2. **Goblet cells**
Mucus membrane lining the airway contains goblet cells which secrete mucus, a slimy material rich in glycoprotein
3. **What is Pleura? What is it function?**
@ The lungs are covered by double walled membrane called pleura
@ It encloses the pleural fluid
4. **What is ventilation (or) Breathing?**
The movement of air between the atmosphere and the lungs is known as ventilation or breathing
5. **Spirometer**
An instrument called spirometer is used to measure the volume of air involved in breathing movements for clinical assessment of a person's pulmonary function
6. **Residual volume(RV)**
@ The volume of air remaining in the lungs after a forceful expiration
@ It is approximately 1100-1200ml
7. **Dead space**
Some of the inspired air never reaches the gas exchange areas but fills the respiratory passages where exchange of gases does not occur
8. **Pneumonia**
Inflammation of the lungs due to infection caused by bacteria or virus is called Pneumonia.
9. **What are occupational repiratory diseases?**
1. Silicosis 2. Asbestosis
10. **Passive smokers**
When a person smokes, nearly 85% of the smoke released is inhaled by the smoker himself and others in the vicinity, called passive smokers, are also affected.
11. **Epiglottis**
During swallowing a thin elastic flap called epiglottis prevents the food from entering into the larynx and avoids choking of food.
12. **Tidal volume(TV)**
Tidal volume is the amount of air inspired or expired with each normal breath. It is apporoximately 500ml.

3 marks:

1. **Haemoglobin**
@ Haemoglobin belongs to the class of conjugated protein
@ It has a molecular weight of 68,000daltons
@ It contains four atoms of iron,each of which can combine with a molecule of oxygen
2. **Oxyhaemoglobin dissociation curve**
A sigmoid curve(s-shaped) is obtained when percentage saturation of haemoglobin with oxygen is plottedagainst pO2. This curve is called oxygen dissociation curve.

3. **Surfactants**
   @ Surfactants are the thin non-cellular films made of protein and phospholipids covering the alveolar Membrane
   @ The surfactant lowers the surface tension in the alveoli and prevents the lungs from collapsing
   @ It also prevents pulmonary odema.
4. **Methaemoglobin**
   @ If the iron component of the haem is in the ferric state, than the normal ferrous state, it is called Methaemoglobin
   @ Methaemoglobin does not bind with O2.
   @ Normally RBC contains less than 1% methaemoglobin

5. **Tuberculosis**
   - ❖ Tuberculosis is caused by Mycobacterium tuberculae
   - ❖ This infection mainly occurs in the lungs and bones
   - ❖ Collection of fluid between the lungs and the chest wall is the main complication of this disease

5 Marks:

1. **Five primary functions of the respiratory system**
   i. To exchange O2 and CO2 between the atmosphere and the blood
   ii. To maintain homeostatic regulation of body pH
   iii. To protect us from inhaled pathogens and pollutants
   iv. To maintain the vocal cords for normal communication
   v. To remove the heat produced during cellular respiration
2. **Write the steps involved in respiration**
   i. The exchange of air between the atmosphere and the lungs
   ii. The exchange of O2 and CO2 by the blood
   iii. Transport of O2 and CO2 by the blood
   iv. Exchange of gases between the blood and the cells
   v. Uptake of O2 by the cells for various activities and the release of CO2
3. **Mechanism of breathing (or) Events in Inspiration and Expiration**
   Copy chart from page no 96.