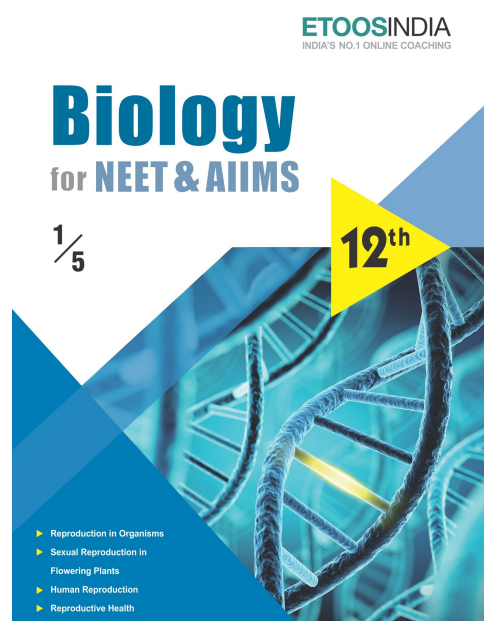
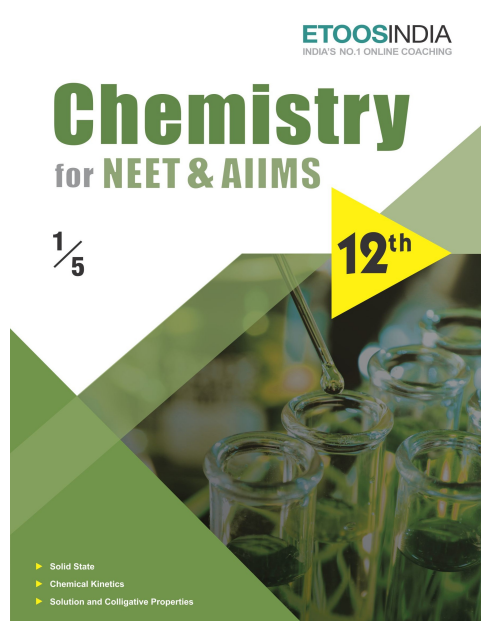
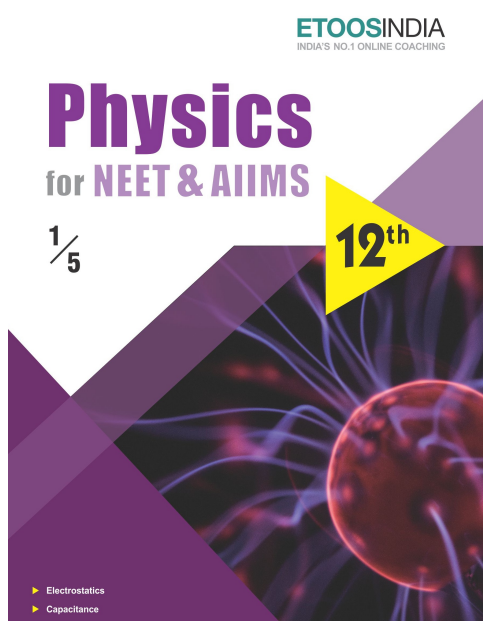
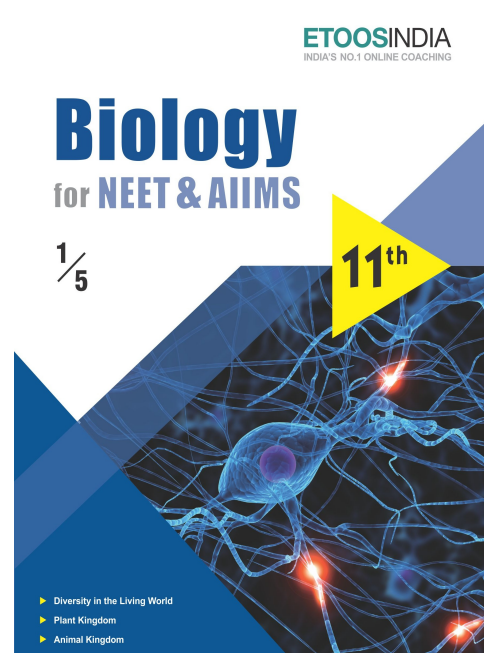
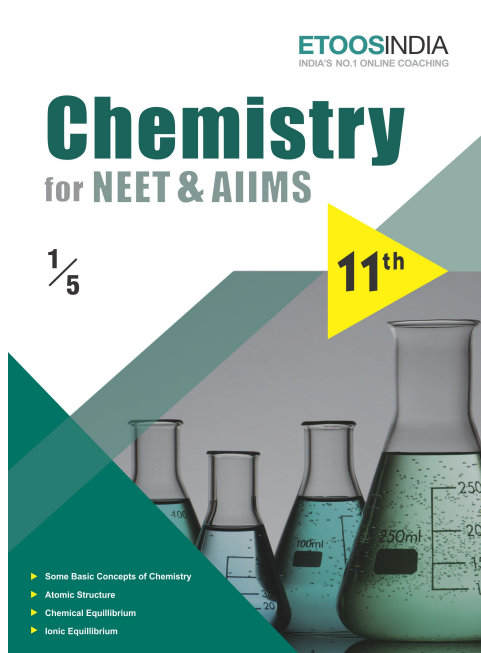
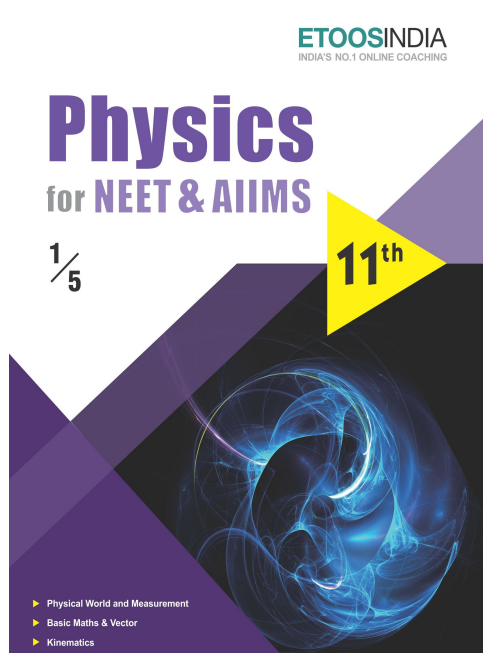


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ANIMAL KINGDOM

“In natural science the principles of truth ought to be confirmed by observation”.

“CARL LINNAEUS (1707-1778)”

INTRODUCTION

When we look around we see wide range of different animals with different structure, body and forms. You see parrots, cockroaches, cats, elephants, dogs, cow, buffalo, crow, piegon, hen, monkey, sparrow, butterflies, mosquito, frogs, human beings, etc. We see them some creep, jump, walk or some swim. All these organisms we are observing in our day to day life, can you imagine these all livings come under Kingdom Animalia.

As over a million species have been described till now, the need for classification becomes more important. But before classifying them, let's study the basic features of all the animals that distinguish them from other living organisms.

ANIMAL KINGDOM

ANIMAL-CLASSIFICATION (PORIFERA TO ECHINODERMATA) BRIEF HISTORY OF ANIMAL TAXONOMY

TAXONOMY

Taxonomy is the branch which deals with the study of nomenclature, classification and their principles. Three steps:

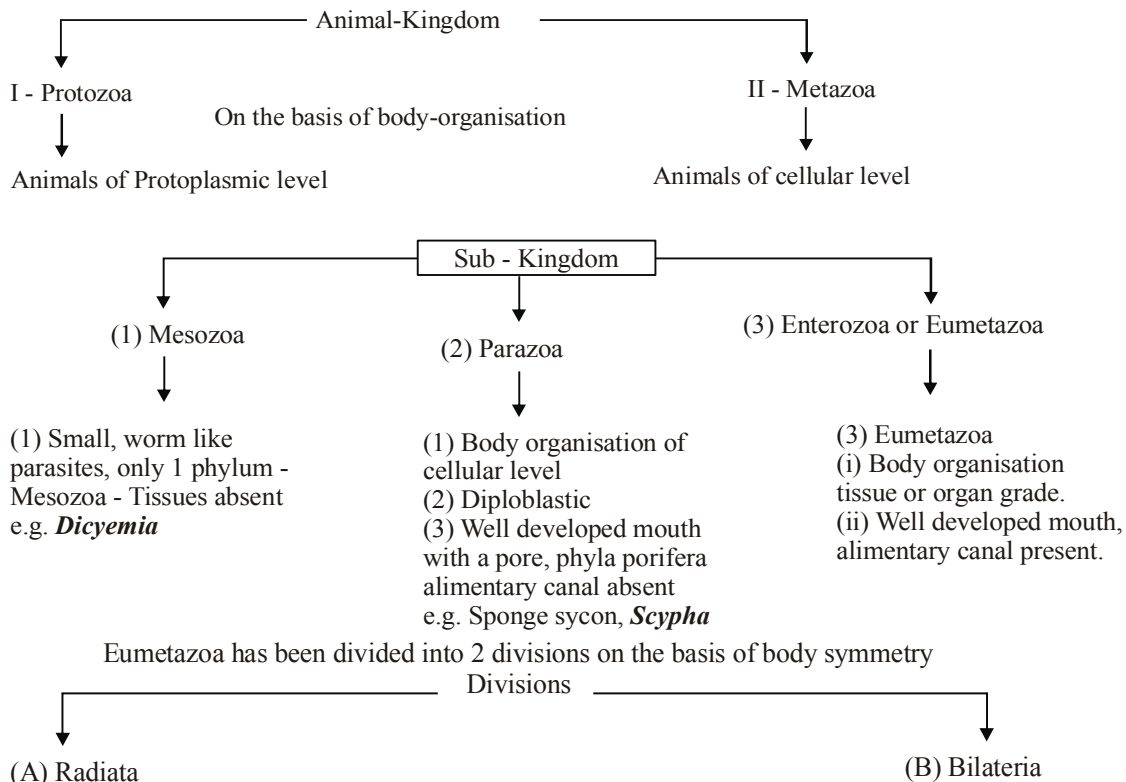
- (1) Identification (2) Nomenclature (3) Classification

Taxonomy word was given by “Candole. It is a Greek word.

Taxis - arrangements (systematics)

Nomos - Law / Rules

Outline of Animal-classification



(A) Division Radiata -

- (i) Diploblastic / Triploblastic
- (ii) Radial symmetry is found, body is bilayered and tissue-grade.
- (iii) Mouth and digestive cavity present - Coelentron / Gastrovascular cavity
- (iv) Anus absent i.e. alimentary canal incomplete.

Radiata includes two phyla -

- (i) Cnidaria or Coelenterata (eg. Hydra) - Diploblastic, radial
- (ii) Ctenophora (e.g. Beroe) - Triploblastic, biradial (According to modern view.)

[B] CLASS - HEXACTINELLIDA OR HYALOSPONGIAE

1. All members are marine.
2. These are of moderate shape and upto 1 m in length.
3. Body is vase or bell or cup-shaped.
4. Endoskeleton is made of silica-spicules, spicules are 6-rayed. These are colourless, shining and also transparent so called "Glass-sponges".
5. Choanocytes are in finger shaped chamber.
6. Canal system is complex leucon type.

Examples

- (i) **Euplectella** - "Venus's flower basket". In Japan given as a Bridal-gift. Male and Female shrimps live in it till death.
- (ii) **Hyalonema** - Glass-rope sponge
- (iii) **Pheronema** - Bowl-sponge
- (iv) **Monorhaphis**

(C) CLASS - DEMOSPONGIAE –

1. Majority are marine but some species are found in fresh water. Mostly large and asymmetrical sponges which may be solitary or colonial.
2. In some skeleton is absent, in some of siliceous spicules, in some made up of Sulphur-containing Spongin protein fibres skeleton, and in some skeleton is made of both spongin fibres and siliceous spicules.
3. Spicules if present are mono or tetra axon.
4. Canal-system Leucon or Rhagon type.
5. They have the capacity of contraction due to special Fibrocytes.

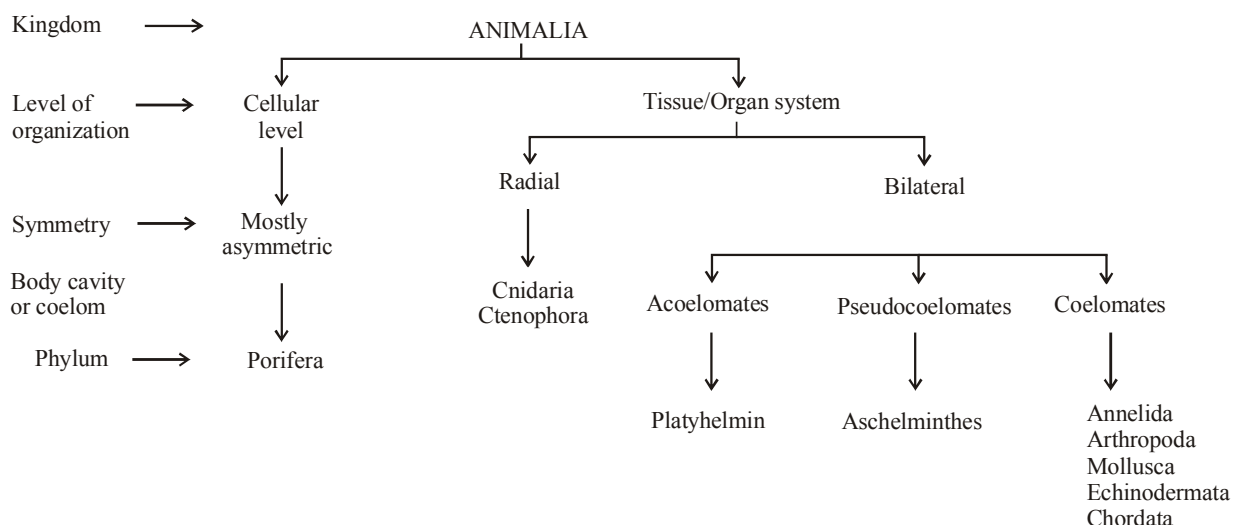
Example

1. **Euspongia** – Bath sponge
2. **Spongilla** - Fresh water sponge. It has zoochlorella living in it as a symbiont.
3. **Ephydatia** - Fresh water sponge.
4. **Cliona** - Boring - sponge.
5. **Chalina** - Mermaid's gloves
6. **Hippospongia** - Horse sponge or Horny sponge
7. **Phyllospongia** - Leaf sponge
8. **Patreon** - Cup shaped sponge.
9. **Oscarella** - Skeleton is absent.
10. **Halichondria** - Bread sponge.
11. **Chondrosia** - Skeleton is absent.
12. **Haliclona** - Finger sponge.
13. **Spongia officinalis** - Turkish bath sponge - Great economic value.

**ETOOS KEY POINTS**

1. Chromocytes are pigmented amoebocytes which provide colour to the animal.
2. Gemmules are formed as endogenous buds.
3. Choanocytes of sponges were discovered by **H.J. Clark**.
4. Sponges have a high power of regeneration due to archaeocyte cells.
5. Several sponges pass, during their embryonic development, through a structure, called **olyntus**. It is called hypothetical ancestor of sponges.
6. Monoaxon spicules are found around the osculum.

Etoos Tips & Formulas



1. INTRODUCTION

- Animals show different types of body organisation
 - (i) Protoplasmic level Eg. - Protozoa
 - (ii) Cellular level Eg. - Porifera
 - (iii) Tissue level Eg. - Coelenterata & Ctenophora
 - (iv) Organ/organ system level Eg. - Platyhelminthes onwards to Chordata.
- Animals can be Asymmetric, Radial and Bilateral symmetric.
- Most of the animals are triploblastic.
- Flatworms are Acoelomate, Round worms are pseudocoelomate whereas rest of the animals are coelomates. Digestive tract is incomplete in coelenterata, ctenophora and platyhelminthes whereas it is complete in rest of the phyla.
- Modes of respiration can be Body surface, cutaneous, branchial and pulmonary.
- Circulatory system is open in Arthropoda, Mollusca, Echinodermata, Hemichordata and in Urochordata whereas it is closed in annelida and rest of the chordates
- Modes of Excretory system includes Flame cells, Nephridia, Malpighian tubules, Green glands and Kidneys in animals.

2. PORIFERA

- Mostly marine, cellular level body organisation with water transport system / Canal system having ostia, osculum and choanocytes (Collar cell) etc.
- Sponges are hermaphrodite and their Fertilization is internal.
 - Eg. - Sponges, Like - Sycon (Scypha), Spongilla (Fresh water sponge), Euspongia (Bath sponge)

3. COELENTERATA

- Mostly marine, radially symmetrical with stinging cell known as Cnidoblast. Mainly two forms i.e. polyp & medusa which exhibit alternation of generation (Metagenesis)
 - Eg. - Hydra, Aurelia (Jelly Fish), Adamsia (Sea anemone), Pennatula (Sea pen), Gorgonia (Sea Fan), Meandrina (Brain coral), Physalia (Portuguese man-of-war).

4. CTENOPHORA

- Exclusively marine popularly known as sea walnuts or comb jellies due to presence of 8-ciliary comb plates which help in locomotion. They show Bioluminescence.
 - Eg. → Ctenoplana, Pleurobrachia

SOLVED EXAMPLE

- Ex.1** The body of the animal can be divided into identical halves in only one plane is
 (A) Asymmetry (B) Bilateral symmetry
 (C) Radial symmetry (D) Biradial symmetry
Sol. (B)
- Ex.2** The space between body wall and alimentary canal lined by mesoderm is called
 (A) Acoelom (B) Pseudocoelom
 (C) Coelom (D) None of these
Sol. (C)
- Ex.3** What is characteristic of deuterostomes
 (A) Spiral cleavage, blastopore becoming mouth
 (B) Radial cleavage, blastopore becoming anus
 (C) Spiral cleavage, blastopore becoming anus
 (D) Radial cleavage, blastopore becoming mouth
Sol. (B)
- Ex.4** Coelom is cavity between alimentary canal and body wall enclosed by
 (A) Ectoderm and endoderm
 (B) Mesoderm and ectoderm
 (C) Ectoderm on both sides
 (D) Mesoderm on both sides
Sol. (D)
- Ex.5** Metameric segmentation is the characteristic of
 (A) Annelida and Arthropoda
 (B) Mollusca and chordata
 (C) Platyhelminthes and Arthropoda
 (D) Echinodermata and Annelida
Sol. (A)
- Ex.6** Radial symmetry is often exhibited by animal is
 (A) One opening of alimentary canal
 (B) Aquatic mode of living
 (C) Benthos/sedentary nature
 (D) Ciliary mode of feeding
Sol. (C)
- Ex.7** True coelom or body cavity occurs in
 (A) Hydra (B) Taenia
 (C) Pheretima (D) Sycon
Sol. (C)
- Ex.8** Which one of the following categories of animals, is correctly described with no single exception in it
 (A) All reptiles possess scales, have a three chambered heart and are cold blooded (poikilothermal)
 (B) All bony fishes have four pairs of gills and an operculum on each side
 (C) All sponges are marine and have collared cells
 (D) All mammals are viviparous and possess diaphragm for breathing
Sol. (C)
- Ex.9** In porifera, skeletonforming cells are
 (A) Sclerocytes (B) Archaeocytes
 (C) Thesocytes (D) Amoebocytes
Sol. (A)
- Ex.10** Common bath sponge is
 (A) Spongilla (B) Euspongia
 (C) Leucosolenia (D) Sycon
Sol. (B)
- Ex.11** One of the following is not a characteristic feature of sponges
 (A) Cellular level of organization
 (B) Presence of ostia
 (C) Intracellular digestion
 (D) Body supported by chitin
 (E) Indirect development
Sol. (D)
- Ex.12** Metagenesis refers to
 (A) Alternation of generation between asexual and sexual phases of an organisms
 (B) Occurrence of a drastic change in form during post embryonic development
 (C) Presence of a segmented body and parthenogenetic mode of reproduction
 (D) Presence of different morphic forms

Exercise # 1**SINGLE OBJECTIVE****NEET LEVEL**

1. The animals of phylum porifera are —
(A) Acellular
(B) Diploblastic
(C) Multicellular with cellular grade of organisation
(D) None
2. Porous animals which lack division of labour & which are fixed belong to —
(A) Radiata (B) Bilateria
(C) Parazoa (D) Eumetazoa
3. Which of the following structure is similar to anus in porifera—
(A) Ostia (B) Osculum
(C) Prostonia (D) Cytophyge
4. One of the following is smallest sponge—
(A) Spheciosongia (B) Leucosolenia
(C) Sycon (D) Scypha
5. Scientist who for the first time reported sponges as animal-
(A) Leeuwenhock (B) Robert Brown
(C) Robert Grant (D) Trumbley
6. Water canal system & water vascular system are found respectively in—
(A) Sycon & Hydra
(B) Star fish & Sycon
(C) Echinoderms
(D) Porifera & Echinoderms
7. Which character differentiates sponges from other metazoa animals—
(A) Absence of blood
(B) Absence of nerve cell
(C) Absence of many ostia & one osculum
(D) All
8. Sponges exhibits—
(A) Only intracellular digestion
(B) Only intercellular digestion
(C) Only extra cellular digestion
(D) A & B
9. The role of porocyte cells is—
(A) Excretion in flat worms
(B) To form excurrent opening for water current in sponge
(C) To secrete sweat in mammals
(D) To form incurrent opening for water current in sponge
10. What is lagoon-
(A) A type of sponge
(B) A type of coral
(C) Central water pool in coral reef
(D) A type of coral reef.
11. Choanocytes are -
(A) Collar cells (B) Thesocytes
(C) Porocytes (D) Pinacocytes
12. Phylum-porifera includes various sponges which has various types of cells to perform different functions. The cells responsible for reproduction are —
(A) Choanocytes (B) Archeocytes
(C) Amoebocytes (D) Porocytes
13. Role of gemmules is —
(A) Sexual reproduction
(B) Asexual reproduction
(C) Dispersal
(D) None
14. Collar cells are found in —
(A) Star fish (B) Sponge
(C) Earthworm (D) Hydra
15. The character on which the classification of sponges is based —
(A) Nutrition (2) Spicules
(C) Locomotion (D) None
16. What will happen if a sponge is mashed by hand & put in a suitable culture medium. ,
(A) The cells will aggregate & form small sponge bodies
(B) The cells will die
(C) The cells will grow enormously.
(D) The cells will lead independent life
17. Mesogloea is found in-
(A) Rabbit (B) Sponge & hydra
(C) Hydra (D) Sponge
18. Phylum-porifera is divided into following classes-
(A) Calcarea, Hexactinillida & Demospongiae
(B) Sarcodina, Sporozoa & Ciliata
(C) Calcarea, Hexactinillida & Sarcodina
(D) Mastigophora & Demospongiae
19. Which of the following lack locomotion -
(A) Amoeba (B) Earthworm
(C) Maggot of house fly (D) Leucosolenia

Exercise # 2

SINGLE OBJECTIVE

AIIMS LEVEL

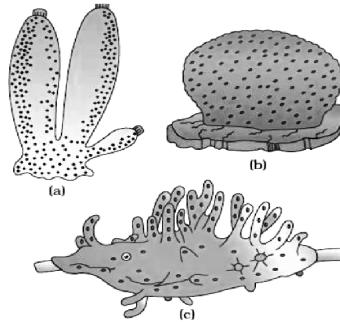
1. The infective stage of *Taenia solium* for secondary host-
(A) Onchosphere (B) Hexacanth
(C) Cysticercus (D) Bladder worm
2. The cause of filariasis is -
(A) Mosquito (B) Bacteria
(C) Helminthes (D) Protozoan
3. Life cycle of which lack secondary host-
(A) Plasmodium (B) Fasciola
(C) Ascaris (D) Taenia
4. The cause of "Naru disease" is-
(A) *Taenia solium* (B) Fasciola
(C) Dracunculus (D) Ascaris
5. Infection of tape worm causes-
(A) Irritation in the alimentary canal (B)
Loss of appetite
(C) Spots on the skin
(D) Itching
6. Leech is -
(A) Insectivorous (B) Larvaevorous
(C) Frugivorous (D) Sanguivorous
7. Which of the following is living fossil-
(A) Peripatus (B) Limulus
(C) Neopilina (D) All
8. Annelid which has Hb & haemocoel-
(A) Earthworm (B) Leech
(C) Nereis (D) All
9. Peripatus is a connecting link between-
(A) Arthropoda & Mollusca
(B) Annelida & Arthropoda
(C) Annelida & Mollusca
(D) Coelenterata & Platyhelminthes
10. Which is found in all annelids-
(A) Haemocoelom (B) Pseudocoelom
(C) True worm (D) Paragastric cavity
11. One of the following is a correct pair -
(A) Star fish - Segmented foot
(B) Scolopendra - Pseudopodia
(C) Amoeba - Tube feet
(D) Nereis - Parapodia
12. Which of the following is bioluminiscent-
(A) Aphrodite (B) Polynoe
(C) Chaetopterus (D) All
13. Metamorphosis is absent in -
(A) Polychaets (B) Oligochaets
(C) Cnidarians (D) All
14. Animal which has unstalked compound eyes & abdomen is without appendages-
(A) Termite (B) Bedbug
(C) All ants (D) All
15. Following is a larva of class Crustacea-
(A) Maggot (B) Hexacanth
(C) Zoea (D) Rediae
16. Arthropoda is largest phylum. The number of species in it is -
(A) About 9,00,000 (B) About 1 crore
(C) About 10,000 (D) Not definite
17. Which of the following is a absurd group-
(A) Hydra, Obelia, Sea anemone
(B) Cuttle fish, Silver fish, Hag fish, Dog fish
(C) Sea lily, Sea cucumber, Sea urchin
(D) Scorpion, Spider, Cockroach
18. One of the following character is similar in leech, mosquito & bedbug-
(A) All insects
(B) Lay eggs in stagnant water
(C) All are endoparasite
(D) Their saliva contains anti-coagulant
19. Haemocoel is found in -
(A) Insects (B) Crustacea
(C) Arachnida (D) All
20. Rearing of hens is called as poultry. Similarly, rearing of honey bees is called as-
(A) Sericulture (B) Animal culture
(C) Apiculture (D) Entomology
21. Respiration in the largest phylum arthropoda takes place by-
(A) Trachea (B) Gills
(C) Book lungs (D) All

Exercise # 3

PART - 1

MATRIX MATCH COLUMN

1. Identify the names of the following figure from the given option



- | | | |
|---------------|-----------|-------------|
| A | B | C |
| (A) Euspongia | Sycon | Spongilla |
| (B) Spongilla | Sycon | Eusporangia |
| (C) Euspongia | Spongilla | Sycon |
| (D) Sycon | Euspongia | Spongilla |

2. Match the following and choose the correct option

- | | |
|------------------------------------|------------------------------------|
| A. Physalia | i. Sea anemone |
| B. Meandrina | ii. Brain coral |
| C. Gorgonia | iii. Sea fan |
| D. Adamsia | iv. Portuguese man of war |
| (A) A - iii; B - ii; C - i; D - iv | (B) A - iv; B - iii; C - ii; D - i |
| (C) A - iv; B - ii; C - iii; D - i | (D) A - ii; B - iii; C - i; D - iv |
| (E) A - i; B - ii; C - iii; D - iv | |

3. Select the right option in which all the following figures are correctly identified

- | | | | |
|-------------------|---------------|---------------|---------------|
| A | B | C | D |
| (A) Adamsia | Aurelia | Pleurobrachia | Cnidoblast |
| (B) Cnidoblast | Pleurobrachia | Adamsia | Aurelia |
| (C) Aurelia | Adamsia | Cnidoblast | Pleurobrachia |
| (D) Pleurobrachia | Cnidoblast | Aurelia | Adamsia |

4. Give the correct match in the following :

- | | |
|----------------------------|-----------------------------|
| Column- I | Column - II |
| A. Flame cells | i. Sponges |
| B. Collar cells | ii. Hydra |
| C. Stinging cells | iii. Planaria |
| | iv. Ascaris |
| (A) A = iii, B = i, C = ii | (B) A = iii, B = i, C = iv |
| (C) A = iii, B = iv, C = i | (D) A = iii, B = ii, C = iv |

5. Identify the following structures labelled A to E in the diagram given below from the list I to V

- | | | | | |
|--|-------------|-----------------------------------|-----|-----|
| I. Septal nephridia | II. Pharynx | IV. Tufts of Pharyngeal nephridia | | |
| III. Forest of integumentary nephridia | | | | |
| A | B | C | D | E |
| (A) II | III | IV | I | V |
| (B) II | IV | V | I | III |
| (C) II | V | IV | III | I |
| (D) II | I | III | IV | V |

Exercise # 4

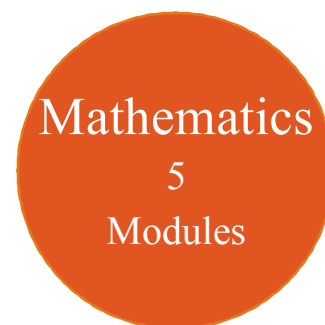
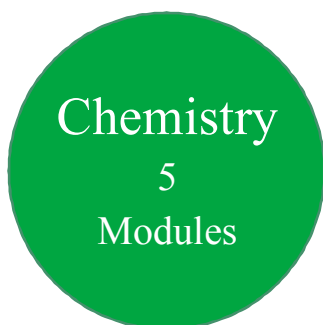
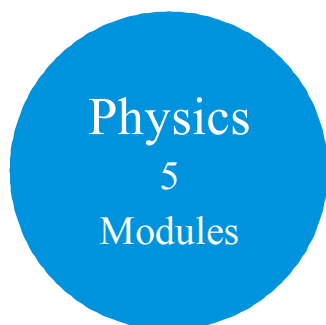
PART - 1

PREVIOUS YEAR (NEET/AIPMT)

- What is common between *Ascaris lumbricoides* and *Anopheles stephensi*? [CBSE AIPMT-2000]
(A) Hibernation (B) Metamerism
(C) Anaerobic respiration (D) Sexual dimorphism
- In which of the following animal, post-anal tail is found? [CBSE AIPMT-2001]
(A) Earthworm (B) Lower invertebrate
(C) Scorpion (D) Snake
- In which of the following chlorocruorin pigment is found? [CBSE AIPMT-2001]
(A) Annelida (B) Echinodermata
(C) Insecta (D) Lower Chordata
- In which of the following notochord is present in embryonic stage? [CBSE AIPMT-2002]
(A) All chordates (B) Some chordates
(C) Vertebrates (D) Non-chordates
- In which animal, dimorphic nucleus is found? [CBSE AIPMT-2002]
(A) *Amoeba*
(B) *Trypanosoma gambiense*
(C) *Plasmodium vivax*
(D) *Paramecium caudatum*
- Given below are four matchings of an animal and its kind of respiratory organ [CBSE AIPMT-2003]
(i) silver fish - trachea
(ii) scorpion - book lung
(iii) sea squirt - Pharyngeal gills
(iv) dolphin - skin
The correct matchings are
(A) (ii) and (iv) (B) (iii) and (ii)
(C) (i) and (iv) (D) (i), (ii) and (iii)
- Which one of the following is correct matching pair of an animal and a certain phenomenon it exhibits? [CBSE AIPMT-2003]
(A) *Chameleon* - Mimicry
(B) *Taenia* - Polymorphism
(C) *Pheretima* - Sexual dimorphism
(D) *Musca* - Complete metamorphosis
- Sycon* belongs to a group of animals which are best described as [CBSE AIPMT-2003]
(A) multicellular with a gastrovascular system
(B) multicellular having tissue organisation, but no body cavity
(C) unicellular or acellular
(D) multicellular without any tissue organisation
- During its life cycle, *Fasciola hepatica* (liver fluke) infects its intermediate host and primary host at the following larval stages respectively [CBSE AIPMT-2003]
(A) metacercaria and cercaria
(B) miracidium and metacercaria
(C) redia and miracidium
(D) cercaria and redia
- A terrestrial animal must be able to [CBSE AIPMT-2004]
(A) excrete large amounts of water in urine
(B) conserve water
(C) actively pump salts out through the skin
(D) excrete large amounts of salts in urine
- The presence of gills in the tadpole of frog indicates that [CBSE AIPMT-2004]
(A) fishes were amphibious in the past
(B) fishes evolved from frog like ancestors
(C) frogs will have gills in future
(D) frogs evolved from gilled ancestors
- In Arthropoda, head and thorax are often fused to form cephalothorax, but in which one of the following classes, is the body divided into head, thorax and abdomen? [CBSE AIPMT-2004]
(A) Insecta (B) Myriapoda
(C) Crustacea (D) Arachnida and Crustacea
- The animal with bilateral symmetry in young stage and radial pentamerous symmetry in the adult stage belong to the phylum. [CBSE AIPMT-2004]
(A) Annelida (B) Mollusca
(C) Cnidaria (D) Echinodermata

1. Body having meshwork of cells, internal cavities lined with food filtering flagellated cells and indirect development are the characteristics of Phylum
(A) Mollusca (B) Protozoa (C) Coelenterata (D) Porifera
2. **Assertion :** In *Pleurobrachia*, eight comb like ciliary plates called comb plates are present on the body that help in locomotion.
Reason : *Pleurobrachia* reproduces sexually and its life cycle includes cydippid larva.
(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.
3. Match the following list of animals with their level of organisation and choose the correct sequence.
Column-I (A) Organ level (B) Cellular aggregate level (C) Tissue level (D) Organ system level
Column-II i. *Pheretima* ii. *Fasciola* iii. *Spongilla* iv. *Obelia*
(A) A-iv, B-iii, C-i, D-ii (B) A-iv, B-ii, C-iii, D-i
(C) A-ii, B-iv, C-iii, D-i (D) A-ii, B-iii, C-iv, D-i
4. One of these is not a feature of non-chordates.
(A) Absence of post anal tail (B) Ventrally located central nervous system
(C) Absence of notochord (D) Ventrally located heart
(E) Absence of gill slits
5. The cercarial stage of a liver fluke is produced by
(A) sexual multiplication (B) asexual multiplication
(C) binary fission (D) parthenogenesis
6. Flame cells of flatworms help in
(i) osmoregulation (ii) digestion (iii) reproduction (iv) excretion
(v) bioluminescence
(A) (ii) only is correct (B) (i) and (iv) are correct
(C) (iii) only is correct (D) (i) and (v) are correct
(E) (iv) and (v) are correct
7. Which of the following phyla has members with a true coelom ?
(A) Aschelminthes (B) Platyhelminthes (C) Arthropoda (D) Coelenterata
8. Match the following list of animals with their level of organisation and choose the correct sequence.
Column I (A) Organ level (B) Cellular aggregate level (C) Tissue level (D) Organ system level
Column II (p) *Pheretima* (q) *Fasciola* (r) *Spongilla* (s) *Obelia*
(A) A-(s), B-(r), C-(p), D-(q) (B) A-(s), B-(q), C-(r), D-(p)
(C) A-(q), B-(s), C-(r), D-(p) (D) A-(q), B-(r), C-(s), D-(p)

11th Class Modules Chapter Details



PHYSICS	CHEMISTRY	BIOLOGY
<p>Module-1</p> <ol style="list-style-type: none"> 1. Physical World & Measurements 2. Basic Maths & Vector 3. Kinematics <p>Module-2</p> <ol style="list-style-type: none"> 1. Law of Motion & Friction 2. Work, Energy & Power <p>Module-3</p> <ol style="list-style-type: none"> 1. Motion of system of particles & Rigid Body 2. Gravitation <p>Module-4</p> <ol style="list-style-type: none"> 1. Mechanical Properties of Matter 2. Thermal Properties of Matter <p>Module-5</p> <ol style="list-style-type: none"> 1. Oscillations 2. Waves 	<p>Module-1(PC)</p> <ol style="list-style-type: none"> 1. Some Basic Concepts of Chemistry 2. Atomic Structure 3. Chemical Equilibrium 4. Ionic Equilibrium <p>Module-2(PC)</p> <ol style="list-style-type: none"> 1. Thermodynamics & Thermochemistry 2. Redox Reaction 3. States Of Matter (Gaseous & Liquid) <p>Module-3(IC)</p> <ol style="list-style-type: none"> 1. Periodic Table 2. Chemical Bonding 3. Hydrogen & Its Compounds 4. S-Block <p>Module-4(OC)</p> <ol style="list-style-type: none"> 1. Nomenclature of Organic Compounds 2. Isomerism 3. General Organic Chemistry <p>Module-5(OC)</p> <ol style="list-style-type: none"> 1. Reaction Mechanism 2. Hydrocarbon 3. Aromatic Hydrocarbon 4. Environmental Chemistry & Analysis Of Organic Compounds 	<p>Module-1</p> <ol style="list-style-type: none"> 1. Diversity in the Living World 2. Plant Kingdom 3. Animal Kingdom <p>Module-2</p> <ol style="list-style-type: none"> 1. Morphology in Flowering Plants 2. Anatomy of Flowering Plants 3. Structural Organization in Animals <p>Module-3</p> <ol style="list-style-type: none"> 1. Cell: The Unit of Life 2. Biomolecules 3. Cell Cycle & Cell Division 4. Transport in Plants 5. Mineral Nutrition <p>Module-4</p> <ol style="list-style-type: none"> 1. Photosynthesis in Higher Plants 2. Respiration in Plants 3. Plant Growth and Development 4. Digestion & Absorption 5. Breathing & Exchange of Gases <p>Module-5</p> <ol style="list-style-type: none"> 1. Body Fluids & Its Circulation 2. Excretory Products & Their Elimination 3. Locomotion & Its Movement 4. Neural Control & Coordination 5. Chemical Coordination and Integration

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12th Class Modules Chapter Details

Physics
5
Modules

Chemistry
5
Modules

Mathematics
5
Modules

PHYSICS	CHEMISTRY	BIOLOGY
<p>Module-1</p> <ol style="list-style-type: none"> 1. Electrostatics 2. Capacitance <p>Module-2</p> <ol style="list-style-type: none"> 1. Current Electricity 2. Magnetic Effect of Current and Magnetism <p>Module-3</p> <ol style="list-style-type: none"> 1. Electromagnetic Induction 2. Alternating Current <p>Module-4</p> <ol style="list-style-type: none"> 1. Geometrical Optics 2. Wave Optics <p>Module-5</p> <ol style="list-style-type: none"> 1. Modern Physics 2. Nuclear Physics 3. Solids & Semiconductor Devices 4. Electromagnetic Waves 	<p>Module-1(PC)</p> <ol style="list-style-type: none"> 1. Solid State 2. Chemical Kinetics 3. Solutions and Colligative Properties <p>Module-2(PC)</p> <ol style="list-style-type: none"> 1. Electrochemistry 2. Surface Chemistry <p>Module-3(IC)</p> <ol style="list-style-type: none"> 1. P-Block Elements 2. Transition Elements (d & f block) 3. Co-ordination Compound 4. Metallurgy <p>Module-4(OC)</p> <ol style="list-style-type: none"> 1. HaloAlkanes & HaloArenes 2. Alcohol, Phenol & Ether 3. Aldehyde, Ketone & Carboxylic Acid <p>Module-5(OC)</p> <ol style="list-style-type: none"> 1. Nitrogen & Its Derivatives 2. Biomolecules & Polymers 3. Chemistry in Everyday Life 	<p>Module-1</p> <ol style="list-style-type: none"> 1. Reproduction in Organisms 2. Sexual Reproduction in Flowering Plants 3. Human Reproduction 4. Reproductive Health <p>Module-2</p> <ol style="list-style-type: none"> 1. Principles of Inheritance and Variation 2. Molecular Basis of Inheritance 3. Evolution <p>Module-3</p> <ol style="list-style-type: none"> 1. Human Health and Disease 2. Strategies for Enhancement in Food Production 3. Microbes in Human Welfare <p>Module-4</p> <ol style="list-style-type: none"> 1. Biotechnology: Principles and Processes 2. Biotechnology and Its Applications 3. Organisms and Populations <p>Module-5</p> <ol style="list-style-type: none"> 1. Ecosystem 2. Biodiversity and Conservation 3. Environmental Issues

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