UNIT-II GENERAL CHARACTERS AND CLASSIFICATION OF INVERTEBRATE PHYLA

Phylum:Protozoa

- As per two-kingdom classification, Protozoa was treated as a phylum under animal kingdom
- Under the three-kingdom classification proposed by Haeckel, it was separated from animal kingdom and was included under the kingdom **Protista**.
- There are about 215000 described species of protists of which about 92000 species are protozoans.
- The first protozoan observed was ***Vorticella convellaria*** by Anton Van Leeuwenhoek.
- Anton Van Leeuwenhoek called Protozoans as animalcules.
- The term Protozoa was coined by **Goldfuss**, for a group of organisms which included protozoans, sponges, coelenterates, rotifers and bryozoans.
- Von Siebold restricted the name Protozoa to apply to all unicellular forms of animal life.
- Hyman preferred the term acellular.

General Characters

- The body is unicellular, however they are preferably be referred to as **acellular** because the single cell performs all the life activities and is functionally equivalent to the whole metazoan animal.
- Division of labour occurs among various organelles of the cell.
- These may be **solitary** (*Euglena)* or **colonia**l *(Proterospongia)*
- Freeliving**- Amoeba**
- Symmetry – **Spherical** - heliozoans, (Actinopodeans), radiolarians (Collozoum) Radial - (Sessile forms)
  Bilateral - Giardia
- Lobose protozoans and foraminifers are asymmetrical
- Body is naked or covered by pellicle or shell made of silica or calcium carbonate
- Division of body is at subcellular level
- Locomotion is brought about by the locomotory organelles like **flagella** and **cilia**, cellular extensions like **pseudopodia** and in some pellicular contractile structures like **myonemes**.
- Nutrition is **holozoic** or holophytic or osmotrophic. Euglena shows mixotrophic nutrition.
- Digestion is intracellular.
- Contractile vacuoles, which are common in freshwater forms mainly, serve for osmoregulation.
- Asexual reproduction by binary or multiple fissions or plasmotomy or budding.
- Sexual reproduction by syngamy or conjugation.
- The phenomenon to tide over unfavourable conditions is encystment.
- They are immortal – somatoplasm and germplasm are not differentiated.

Classification

- B.M. Honigberg and others classified Phylum Protozoa into four subphyla: Sarcomastigophora, Sporozoa, Cnidospora and Ciliophora.
- **Subphylum-I Sarcomastigophora**
  - Is characterized by the presence of pseudopodia or flagella for locomotion.
  - It includes three superclasses – Mastigophora, Opalinata and Sarcodina.
- **Superclass Mastigophora**:
  - Body is covered by pellicle;
  - locomotory organelles are flagella;
  - Asexual reproduction by longitudinal binary fission.
  - It includes two classes – Phytomastigophora and Zoomastigophora
- **Class Phytomastigophora**:
  - Some are with chlorophyll bearing chloroplasts.
  - Nutrition is holophytic
  - Reserve food is paramylum
  - Includes euglenoids and dinoflagllates
  - Examples: ***Ceratium*** (dinoflagellate with chloroplasts) ***Noctiluca*** (dinoflagellate without chloroplasts), Euglena
- **Class Zoomastigophora**:
  - Mostly parasitic;
  - Chloroplasts are absent; nutrition is holozoic, saprobic or parasitic.
  - Reserve food is glycogen or volutin
  - Examples: ***Trichomonas, Trichonympha (Mutulistic) , Leishmania.***
- **Superclass Opalinata**:
  - Commensals or parasites in the gut of **anurans**;
  - Body is covered by oblique rows of cilia ***but without infraciliary system***.
  - Some are binuleate, others are multinucleate but ***homokaryotic*** i.e. the nuclei are identical.
  - Asexual reproduction by longitudinal binary fission and ***plasmotomy***.

- Sexual reproduction is ***syngamy with flagellated gametes***
  Examples ***Opalina, Zelleriella***

- **Superclass Sarcodina**:
  - Locomotion is brought about by pseudopodia.
  - It includes three classes – Rhizopodea, Piroplasmea and Actinopodea.
- **Class Rhizopodea**:
  - It includes amoebas, foraminiferans and mycetozoans.
  - Amoebas have lobopodia or filopodia; foraminiferans have reticulopodia.
  - In amoebas, body is naked (***Amoeba, Entamoeba***) or covered by a ***test*** (***Arcella***).
  - Foraminiferans have a ***calcareous*** porous shell.
  - Calcareous shells of dead individuals form foraminiferan ooze.
  - Examples: ***Elphidium*** (foraminiferan), ***Physarum*** (acellular slime mould with a plasmodium stage in the life history), ***Dictyostelium*** (cellular slime mould with pseudoplasmodium stage in the life history).
- **Class Piroplasmea**:
  - Parasitic; locomotory structures absent; spores are absent.
  - Example: ***Babesia*** (causes red water fever in cattle)
- **Class Actinopodea**:
  - These are the ray footed protozoans
  - Locomotory structures are **axopodia**
  - Skeleton consists of **siliceous shell** (Radiolaria) or **strontium sulphate spines** (Acantharea) or **siliceous shell or radiating needles** (Heliozoa).
  - Silicious shells of radiolarians form ooze
  - Examples: ***Collozoum*** (radiolarian) ***Actinophrys*** (heliozoan) ***Acanthometra*** (acantharean), Actinosphaerium
- **Subphylum-II Sporozoa** or **Apicomplexa:**
  - Parasitic; no special locomotory structures; pseudopodia, if present, useful only in ingestion.
  - Sporozoites and merozoites bear anterior apical complex that helps penetrate host cells.
  - No polar filaments
  - It includes three classes – Telosporea, Toxoplasmea and Haplosporea.
- **Class Telosporea**:
  - Sporozoites are long.
  - Gamonts are large, extracellular - **gregarinids**
  - Gamonts are small, intracellular - **coccidians**
  - Syngamy is isogamy - Gregarinids

  Anisogamy - Coccidians
  - Examples: ***Monocystis*** (parasite in the seminal vesicles of earthworms), ***Eimeria, Plasmodium, Gregarina***
- **Class Toxoplasmea**:
  - Body covered by two layered pellicle
  - Only asexual reproduction, by **endodyogeny.** It is internal budding wherein two daughter cells are produced within a mother cell and the mother cell is destroyed in the process.
  - Example: ***Toxoplasma***
- **Class Haplosporea**:
  - Spores are present and are amoeboid.
  - Reproduction is only asexual, by multiple fission.
  - Each spore contains single sporozoite
  - Example: ***Haplosporidium***
- **Subphylum-III Cnidospora:**
  - Parasitic.
  - No special locomotory structures.
  - Spores with **1** or more protoplasmic masses called - **sporoplasms**
  - Spores are provided with one or more polar filaments, which are useful for attachment to the host.
  - It includes two classes – **Myxosporidea** and **Microsporidea**.
- **Class Myxosporidea**:
  - Extracellular parasites of cold blooded vertebrates
  - Spores with typically two capsules each with single polar filament.
  - Example: ***Myxobolus***
- **Class Microsporidea:**
  - Intracellular parasites.
  - Spore with one intrasporal or 1-2 intracapsular filaments .
  - Spores with single sporoplasm
  - Example: ***Nosema bombycis*** (causes pebrine disease in silkworms)**.**
- **Subphylum IV Ciliophora**:
  - Complex protozoans.
  - Cilia are useful in locomotion and food capture.
  - **Suctorian ciliates** are sessile and are with cilia only in young stages. In adult suctorians the cilia are replaced by sucking tentacles that help in food capture.
  - **Dimorphic nuclei** – macronucleus (vegetative and polyploid) and micronucleus (reproductive and diploid).

- **Infraciliary system** is present.
- Sexual reproduction by **conjugation**, which brings about nuclear reorganization.

- Only class under this subphylum is **Class Ciliata**.
  - Example: ***Paramecium, Balantidium, (parasitic ciliate in man) Acineta*** (Suctorian)

PROTOZOA
LEVEL - I

1. The term 'Protozoa' was coined by
   1) Leeuwenhoek 2) Hyman
   3)Goldfuss 3) Haeckel
2. Which of the following is an example of a colonial protozoan?
   1) Euglena 2) Proterospongia
   3) Amoeba 4) Giardia
3. Body symmetry is spherical in
   1) Actinophrys 3) Acineta
   3) Giardia 4) Amoeba
4. *Euglena* performs more than one type of nutrition. Hence it is described as
   1) Osmotrophic 2) Holozoic
   3) Mixotrophic 4) Photoautotrophic
5. The chief function of contractile vacuoles in freshwater protozoans is
   1) Excretion 2) Osmoregulation
   3) Diffusion 4) Respiration
6. Which of the following is not a type of asexual reproduction?
   1) Plasmotomy 2) Budding
   3) Binary fission 4) Syngamy
7. Protozoans are considered to be 'immortal', because of
   1) Myxorophic nutrition
   2) Formation of spores
   3) Non differentiation of somatoplasm and germplasm
   4) acellular nature
8. Who called the protozonas as unicellular animals
   1) Goldfuss 2) Hyman
   3) Von Siebold 4) Leeuwen hoek
9. The first protozoan observed was
   1) Eimeria stidae
   2) Vorticella convellaria
   3) Vorticella monilata 4) Paramecium
10. Hyman preferred to call protozonas as
    1) Unicellular 2) Acellular
    3) Uninucleate 4) Mononucleate
11. Which of the following is a dinoflagellate with autotrophic nutrition?
    1) Noctiluca 2) Ceratium
    3) Euglena 4) Trichomonas
12. Dinoflagellate without chloroplasts is
    1) Euglena 2) Ceratium
    3) Noctiluca 4) Zelleriella
13. Reserve food is in the form of volutin in
    1) Noctiluca 2) Trypanosoma
    3) Opalina 4) Physarum
14. Mutualistic protozonas are
    1) Trichomonas vaginalis and Trichonympha
    2) Trichonympha and Trypanosoma gambiense
    3) Trichonympha and Leishmania
    4) Trichomonas termopsidis and Trichonympha
15. Shell is made up of strontium sulphate in
    1) Some heliozoans 2) Some forminiferans
    3) Some suctorians 4) Some radiolarians
16. Body is covered by test in
    1) Elphidium 2) Actinophrys
    3) Collozoum 4) Arcella
17. Example of an acellular slime mould with a plasmodium stage in its life cycle.
    1) Physarum 2) Dictyostelium
    3) Collozoum 4) Acanthometra
18. The skeleton of foraminiferans is mostly made up of
    1) Calcium carbonate 2) Silica
    3) Strontium sulphate 4) Protein
19. Which of the following following statements is incorrect about Opalinids?
    1) Cilia are present with infraciliary system
    2) Some show multinucleated condition.
    3) Plasmotomy is shown in multinucleated opalinids
    4) Sexual reproduction is by anisogamy
20. Opalinids have cilia but show_____ condition
    1) Nuclear dimorphism 2) Monomorphic
    3) Heterokaryotic 4) Heterokont
21. Though *Opalina* has cilia it was not included in ciliata because of
    1) multinucleated condition
    2) plasmotomy
    3) absence of infraciliary system
    4) parasitic mode of life
22. Sexual reproduction is by syngamy with flagellated gametes in
    1) Monocystis 2) Plasmodium
    3) Zelleriella 4) Trypanosoma
23. Body is covered by oblique rows of cilia rising from anterior subterminal rows in
    1) Ceratium 2) Opalina
    3) Plasmodium 4) Gregarina
24. Syngamy in gregarinids and coccidians is respectively
    1) isogamy and anisogamy
    2) anisogamy and isogamy

3) isogamy and heterogamy
4) monospermy and polyspermy

25. Gamonts are large extracellular and small intracellular respectively in
1) Gegarinids and coccidians
2) Cnidospora and Telospora
3) Myxosporidea and microsporidea
4) Telosporea and Taxoplasmea

26. Structure that helps in penetration of sporozoans is
1) Apical complex 2) Spines
3) Pseudopodia 4) Polar filaments

27. Asexual reproduction is by endodyogeny in
1) Eimeria *2) Toxoplasma*
3) Monocystis *4) Haplosporidium*

28. Internal budding wherein two daughter cells are produced with in a mother cell is
1) gemmation 2) gemmule formation
3) sporogony 4) endodyogeny

29. Protoplasmic masses present in the spores of cnidosporans
1) Sporoplasms 2) Sporoblasts
3) Teloblasts 4) Sporocysts

30. Intracellular and extracellular cnidosporans are respectively
1) Taxoplasma and Haplosporidium
2) Myxobolus and Nosema
3) Nosema and Myxobolus
4) Haplosporidium and Taxoplasma

31. Spores with typically two polar capsules, each with a polar filament found in
1) Taxoplasmea *2) Haplosporea*
3) Myxosporidea *4) Microsporidea*

32. Spores has outer proteinaceous exospore, middle chitinous endospore and inner membrane surrounding the cytoplasm in
1) Nosema *2) Opalina*
3) Monocystis *4) Gregarina*

33. Protozoan that causes pebrine disease in silk worms is
1) Babesia *2) Gregarina*
3) Nyctotherus *4) Nosema bombycis*

34. Cnidosporans with a single polar filament
1) Myxobolus 2) Toxoplasma
3) Nosema 4) Balantidium

35. Spores are amoeboid in
1) Taxoplasma *2) Haplosporidium*
3) Myxobolus *4) Nosema*

36. Which of the protozoan causes red water fever in cattle?
1) Acanthometra *2) Slime mould*
3) Physarum *4) Babesia*

37. Siliceous scales and spines are the exoskeletal structures of
1) Collozoum *2) Actinophrys*
3) Acanthometra *4) Elphidium*

38. The type of reproduction in Ciliates, which brings about nuclear reorganisation is
1) Plasmotomy 2) Budding
3) Conjugation 4) Multiple fission

39. Sucking tentacles in Suctorians help in
1) Locomotion 2) Capturing the prey
3) Attachment 4) Adhesion

40. Nature of macronucleus in ciliates is
1) Haploid 2) Diploid
3) Polyploid
4) With only one set of chromosomes

LEVEL - II

41. Select the correct statements from the following
i) Foraminiferans are marine protozoans
ii) Heliozonas are marine and fresh water protozoans
iii) Radiolarians are marine and fresh water protozonas
iv) Slime moulds are parasitic protists
1) i, ii, iii & iv 2) i, ii and iii
3) i and ii only 4) iii and iv only

42. Select the correct statements from the following
i) All phytomastigophorans have chloroplasts
ii) All sporozoans are parasitic
iii) All ciliates are free living
iv) All cnidosporans reproduce by spores
1) i and ii 2) ii and iii
3) iii and iv 4) ii and iv

43. Select the correct statements from the following
i) Contractile vacuole is absent in marine and parasitic protozoans
ii) Locomotary structures are absent in cnidosporans
iii) infraciliary system is absent in opalinids
iv) Budding method of reproduction is absent in protozoans
1) All except i 2) All except ii
3) All except iii 4) All except iv

44. Select the correct statements from the following
i) Spores are amoeboid in Haplosporea
ii) Spores are without polar filaments in sporozoa
iii) Spores are with single intrasporal filament in microsporidea
iv) Spores are with two polar capsules in myxosporidea
1) i and ii only 2) i, ii, iii & iv
3) ii and iii only 4) i, ii and iv only

45. Match the following

Symmetry	Protozonas
A) Radial symmetry	i) Foraminiferans
B) Asymmetry	ii) Heliozoans
C) Spherical symmetry	iii) *Giardia*
D) Bilateral symmetry	iv) Choanoflagellates

1) A-iv, B-ii, C-i, D-ii
2) A-iv, B-i, C-iii, D-ii
3) A-i, B-iv, C-ii, D-iii
4) A-iv, B-i, C-ii, D-iii

46. Match the following

A) Parasitic flagellate	i) *Plasmodium vivax*
B) Parasitic Rhizopod	*ii) Entamoeba histolytica*
C) Telosporean parasite	*iii) Balantidium*
D) Microsporedean	*iv) Leishmania donovani*
E) Ciliophore parasite	*v)Nosema bombycis*

1) A-i, B-ii, C-iii, D-iii, E-v
2) A-iv, B-i, C-ii, D-iii, E-v
3) A-iv, B-ii, C-i, D-v, E-iii
4) A-v, B-i, C-iii, D-ii, E-iv

47. Match the following

A) Radiolarian	*i) Actinophrys*
B) Foraminiferan	*ii) Acineta*
C) Heliozoan	*iii) Elphidium*
D) Suctorian	*iv) Collozoum*
	v) Dictyostelium

1) A-i, B-v, C-iii, D-iv
2) A-iv, B-iii, C-i, D-ii
3) A-iii, B-iv, C-ii, D-i
4) A-iv, B-v, C-iii, D-ii

48. Match the following

A) Endodyogeny	*i) Paramecium*
B) Plasmotomy	*ii) Plasmodium*
C) Autogamy	*iii) Taxoplasma*
D) Anisogamy	*iv) Opalina*
E) Isogamy	*v) Monocystis*

1) A-iii, B-iv, C-i, D-ii, E-v
2) A-iv, B-i, C-ii, D-v, E-ii
3) A-i, B-iv, C-v, D-ii, E-iii
4) A-v, B-i, C-ii, D-iv, E-iii

Note : Identify the correct answer.

1) A and R are correct R explains A
2) A and R are correct R does not explains A
3) A is correct and R is false
4) Both A and R are false

49 **Assertion (A):** Protozoans are immortal, excempt from natural death
Reason (R) : Somatoplasm and germ plasm are not differentiated

50. **Assertion (A):** Contractile vacuoles are present in fresh water protozonas
Reason (R) : Fresh water protozoans live in hypotonic environment (medium)

51. **Assertion (A):** Hymen preferred to call the protozoans as acellular
Reason (R) : Body of protozoans is functionally not equivalent to a metazoan cell but to metazoan animal

52. **Assertion (A):** Locomotary structures are 0usually absent in parasitic protozoans
Reason (R) : All parasitic protozoans reproduce by spores

Phylum:Porifera

- It includes-**Sedenatary, mostly branched, 'Plant like animals'**
- These are commonly called-**Sponges**
- **'Grant'** established their animal nature & coined the word-**Porifera (Pore bearing animals).**
- Because of absence of well defined tissues they are kept in a separate sub-kingdom-**Parazoa (different from Eumetazoa)**
- Family Spongillidae includes fresh water sponges (eg:Spongilla)
- Symmetry of sponges- **Radially symmetrical or asymmetrical**
- Sponges are multicellular& cell layeres are not true tissues because- **The cells are relatively 'unspecialised' (tissue& organ grade of organisation-absent)**
- Body wall of sponges consists of **-2 layers**
- The two layers are separated by a gelatinous substance called- **Mesohyl or mesenchyme**
- Outer layer is called-**pinacoderm (epidermis)**
- Pinacoderm is made up of **- flattened cells called pinacocytes**
- Inner layer is called **-choanoderm(gastrodermis)**
- Choanoderm is made up of specialized cells with a flagellum & collar around its base called **-choanocytes or collar cells.**
- Mesohyl contains wandering-**amoebocytes**
- Large cells with large nuclei are called **-archeocytes which are phagocytes & play a role in digestion**
- Archaeocytes can capable of giving rise to any other cell types, hence these are called-**totipotent cells**
- Contractile cells found around osculum **- myocytes**
- Cells produce spicules and spongin fibres, respectively **- Scleorocytes and Spongocytes**

- Inhalent pores are called-**Ostia**
- Pores occur in specialized cells called **-porocytes**
- Porocytes occur in between **-pinacocytes &extend up to the spongocoel through body wall**
- Central cavity of sponges is called **-spongocoel or paragastric cavity**
- Paragastric cavity opens out through **-osculum, an exhalant pore**
- Pores on the body open into a simple or complex unique system called**- Canal system or Acquiferous system**
- Two unique features of sponges - **Acquiferous system and totipotent nature of cells**
- Choanocytes help in **-drawing water into the body, eliminates ammonia &exchange of O_2 & CO_2 by simple diffusion.**
- Nutrition is -holozoic
- Sponges are **- Suspension feeders or filter feeders.**
- Collar cells ingest food by-phagocytosis&digest them
- Digestion is **- Intracellular (as in protozoans)**
- Digestion occur in **-collar cells & arachaeocytes**
- reserve food material are stored in cells called **- thesocytes**
- Internal skeleton is made up of **- calcareous or sliliceous spicules or proteinaceous spongin fibres or both.**
- As Nerve cells & Sensory cells are absent **-there is no coordination of the functioning of various parts of body**
- Asexual reproduction occurs by**-budding, framgmentation gemmules**
- Most cells of fresh water sponges contain **- contractile vecule**
- Fresh water sponges&a few marine sponges produce**- internal buds called gemmules**
- Gemmules help **- to tide over unfavourable conditions.**
- Most sponges are- hermaphrodites
- Sperms & eggs develop from**-Choanocytes &archaeocytes**
- Sperms are carried to spongocoel by **-Choanocytes**
- Fertilization occurs in **- mesohyl**
- Cleavage is **- holoblastic (complete)**
- Development is **-Indirect with larval stages like paranchymula (Stereogastrula) and amphiblastula**
- Power of regeneration is **-high (even loose cells can aggregate to form the entire body)**

CLASSIFICATION:

- Phylum Porifera is divided into three classes
  Class: Calcarea (Calcispongiae)
- These are simple, live in **- Shallow waters**
- Spicules are **- calcareous, monaxon, triaxon or tetraxon**
  Larva is Coeloblastula or amphiblastula
  E.g: *Scypha*, Leucosolenia, *Clathrina*
  Class**- Hexactinellida**
- These are solitary sponges living in**- Deeper parts of Sea**
- Skeleton consists of 6 rayed (hexactinal) Siliceous spicules
- Development includes **- Trichimella Larva**
  E.g: Hyalonema-glassrope sponge
  Euplectella **-venus flower basket**
  Class:Demospongia
- It includes marine, fresh water sponges
- Skeleton is made up of **- siliceous spicules or spongin fibres or both**
- Development parenchymulla larva
  e.g: *Spongilla* **- Fresh water sponge**
  Euspongia **- bath sponge,**
  Chalina **- dead man's finger**
  e.g.: *Cliona* - **boring sponge**
- Calcarea and Demospongiae are grouped under subphylum **- Cellularia**
- Hexactinellidans include under subphylum **- Symplasma**

PHYLUM - PORIFERA

LEVEL-I

53. In sponges, the two layers of cells separated by gelatinous region called
    1) Mesohyl 2) Parenchyme
    3) Mesoderm 4) Both 1 & 2
54. Collar cells of poriferans are also called
    1) Choanocytes 2) Amoebocytes
    3) Archeocytes 4) Pinacocytes
55. Cells that produce spicules are
    1) Amoebocytes 2) Archeocytes
    3) Spongocytes 4) Sclerocytes
56. The method in which cells are capable of giving rise to any other types of cells is
    1) Phagocytosis 2) Totipotency
    3) Pinocytosis 4) Regeneration
57. Body of Poriferans has a central cavity called
    1) Paragastric 2) Spongocoel
    3) Both 1 & 2 4) Enteron
58. The inhalant & exhalant pores of Poriferans respectively are

1) Ostia
2) Choanocytes - Pinacocytes
3) Ostia - Osculum 4) Osculum - Ostia

59. Type of nutrition in sponges is
1) Saprophytic 2) Holozoic
3) Saprozoic 4) Autotrophic

60. Digestion is intracellular and also occurs in
1) Collar cells & Archaeocytes
2) Pinacocytes & Amoebocytes
3) Amoebocytes & Thesocytes
4) Pinacocytes & Choanocytes

61. Unique system of sponges is
1)canal system
2) haemocoelomic system
3) gastrovascular system
4) Ambulacral system

62. Sponges reproduces asexually by
1) Encystment 2) Budding
3) Binary fission 4) Multiple fission

63. Fresh water & a few marine sponges produce these structures
1) Spores 2) Microspores
3) Gemmules 4) Megaspores

64. Female gametes are present in this region in all sponges
1) Spongocoel 2) Mesohyl
3) Canal system 4) Skeleton

65. In sponges, the gametes are developed from
1) Choanocytes & Archeocytes
2) Choanocytes only
3) Archeocytes only 4) Thesocytes

66. Type of cleavage in sponges is
1) Mesoblastic 2) Teloblastic
3) Holoblastic 4) Meroblastic

67. In sponges fertilization occurs in
1) Spongocoel 2) Archeocytes
3) Mesohyl 4) Canal system

68. In sponges minute pores occur in specialized cells called
1) porocytes 2) choanocytes
3) thesocytes 4) archeocytes

69. In *Scypha / Sycon* the larva is called
1) Amphiblastula 2) Blastula
3) Parenchymula 4) Stereogastrula

70. In sponges sperms cells are carried to the mesohyl by
1) pinacocytes 2) archeocytes
3) thesocytes 4) choanocytes

71. Which of the following not a marine sponge
1) Chalina *2) Spongilla*
3) Euspongia *4) Scypha*

72. Parenchymula a larva of
1) *Clatharina* 2) *Leucosolenia*
3) *Hyalonema* 4) *Spongilla*

73. Animal nature of sponges was established by
1) Grant 2) Goldfuss 3) Barnes
4) Gegenbaur

74. Poriferans were kept in a separate subkingdom metazoa, it is due to absence of
1) locomotion 2) symmetry
3) true tissues 4) mouth and anus

75. As per Whittaker's classification the first phylum in the animal kingdom is
1) Protozoa 2) Porifera
3) Cnidaria 4) Ctenophora

76. Among amoebocytes of sponges, large cells with large nuclei are
1) thesocytes 2) scleroblasts
3) archeocytes 4) choanocytes

77. The cells in the body of sponges that help in drawing water into body are
1) pinacocytes 2) choanocytes
3) phagocytes 4) scleroblasts

78. Unique system present in the body of sponges helps in
1) locomotion, excretion and respiration
2) nutrition, excretion and respiration
3) respiration, circulation and reproduction
4) reproduction, locomotion and excretion

79. Porocytes occur in between pinacocytes and extend upto the spongocoel through body wall in
1) fresh water sponges only
2) complex sponges
3) all marine sponges 4) simple sponges

80. Which of the following are absent in sponges
1) true tissues and larva forms
2) sensory cells and nerve cells only
3) pinacocytes and choanocytes
4) sensory cells, nerve cells and tissues

81. The level of organisation in the metazoans that remained as an evolutionary blind off shoot is
1) subcellular level 2) cellular level
3) tissue level 4) organ system level

82. Fresh water sponges tide over unfavourable conditions by the production of
1) external buds 2) spores
3) cysts 4) gemmules

83. Sponge with calcareous spicules & that lives in shallow water
1) Cliona *2) Euspongia*
3) Leucosolenia *4) Chalina*

84. Sponges with calcareous spicules live in
1) fresh water 2) shallow waters
3) deeper parts of sea 4) fresh and marine water

85. Sponges with siliceous spicules of 6 rays belong to class
1) Hexactinellida 2) Calcarea
3) Demospongia 4) Calcispongiae

86. Glass sponges belongs to
1) Calcaria 2) Demospongia
3) Hexactinellida 4) Calcispongiae

87. Sponge with hexactinal spicules is
1) Scypha *2) Euplectella*
3) Chalina *4) Spongilla*

88. The class that includes the spongillidae members is
1) Calcaria 2) Hexactinellida
3) Demospongia 4) Calcispongiae

89. Siliceous spicules other than six rayed seen in
1) Chalina *2) Leucosolenia*
3) Hylonema *4) Euplectella*

90. Sponges show similarities with choanoflagellate protists in
1) extracellular digestion & collar cells
2) intracellular digestion and reversal of body layers
3) intercellular digestion and collar cells
4) choanocytes and pinacocytes

91. Identify the example for demospongiae
1) Sycon *2) Chalina*
3) Euplectella *4) Clathrina*

92. Choanocytes of sponges that occur at depths
1) *Calcareans* *2) Hexactinellidins*
3) Demospongia 4) One & Two

LEVEL - II

93. Match the following :

List- I	List - II
A) Bath sponge	i) *Euplectella*
B) Dead man's fingers	ii) *Spongilla*
C) Venus flower basket	iii) *Euspongia*
D) Glass-rope sponge	iv) *Hyalonema*
	v) *Chalina*

	A	**B**	**C**	**D**
1)	I	II	V	IV
2)	III	V	I	IV
3)	V	IV	II	I
4)	II	III	I	IV

94. Match the following

A) Thesocytes	i) form eggs
B) Archeocytes	ii) produce spicules
C) Choanocytes	iii) sensory cells
D) Scleroblasts	iv) storage of food
	v) form sperm cells

1) A-v, B-i, C-iii, D-iv
2) A-i, B-ii, C-iii, D-iv
3) A-v, B-iv, C-iii, D-I
4) A-iv, B-i, C-v, D-ii

95. Match the following

A) Spongilla	i) Glass sponge
B) Hylonema	ii) Calcarious sponge
C) Scypha	iii) Simple sponge
D) Leucosolenia	iv) Fresh water sponge

1) A-iv, B-i, C-iii, D-ii 2) A-ii, B-iii, C-i, D-iv
3) A-iii, B-ii, C-i, D-iv 4) A-iv, B-ii, C-i, D-iv

96. Match the following

A) Leucosolenia	i) Solitory sponge
B) Euplectella	ii) siliceous spicules
C) Spongilla	iii) Spongin fibres
D) Hyalonema	iv) calcarious spicules

1) A-i, B-ii, C-iii, D-iv
2) A-ii, B-iv, C-i, D-iii
3) A-iv, B-i, C-iii, D-ii
4) A-i, B-iv, C-ii, D-iii

97. Match the following

A) Scypha	i) Silicious spicules
B) Leucosolenia	ii) Spongin fibres
C) Spongilla	iii) Stereogastrula
D) Hyalonema	iv) Amphiblastula

1) A-iv, B-i, C-iii, D-ii
2) A-iv, B-iii, C-ii, D-i
3) A-i, B-iv, C-ii, D-iii
4) A-i, B-ii, C-iii, D-iv

Note: 1) A and R are correct R explains A
2) A and R are correct R does not explains A
3) A is correct and R is false
4) Both A and R are false

98. **Assertion(A):** Sponges are true diploblastic animals
Reason (R) : Sponges have two tissue layers such as pinocoderm and choanoderm

99. **Assertion(A):** There is no coordination of functioning of the various parts of the body of sponges
Reason (R) : Nerve cells and sensory cells are relatively unspecialized in sponges

100. **Assertion(A):** Power of regeneration in sponges is well developed
Reason (R) : Archaeocytes of sponges can transform into other cell types in sponges

101. **Assertion(A):** Inspite of multicellular nature, sponges are separated from true metazoa (Eumetazoa)
Reason (R) : Sponges lack well defined tissues in their body

102. Based on the direction of flow of water through the body of sponges arrange the following in a correct order
a) Spongocoel b) Ostia
c) Canal system d) Osculum
1) c-a-b-d 2) b-d-a-c
3) b-c-a-d 4) d-b-c-a

103. Arrange the following parts through which sperm passes to reach the site of fertilization
a) Spongocoel b) Ostia
c) Canal system d) Mesohyl
1) c-a-b-d 2) b-d-a-c 3) d-b-c-a 4) b-c-a-d

104. Select the correct statements from the following
i) Most sponges are hermaphrodites
ii) Most sponges are marine
iii) Many sponges are asymmetrical
iv) Sponges are mostly branched
1) i, ii, iii & iv 2) i, ii and iv only
3) iii and iv only 4) i, iii and iv only

105. Select the correct statement(s) from the following with regard to sponges
i) Few fresh water sponges and all marine sponges produce gemmules
ii) Egg cells and sperm cells develop from choanocytes and archeocytes respectively
iii) Cleavage is holoblastic and development is indirect
iv) Fertilization is internal, it takes place in spongocoel
1) All except i 2) All except ii
3) Only iii 4) Only iv

106. Select the correct statements from the following
i) Amphiblastula is the larval form of *Leucosolenia*
ii) Trichimella is the larval form of *Euplectella*
iii) Parenchymula is a larva of spongilla
iv) Mesenchyme of sponges is derived from the mesoderm
1) All except i 2) All except ii
3) All except iii 4) All except iv

107. Select the correct statements from the following
i) Ostia are minute, inhalant pores
ii) Osculum is single, large exhalant pore
iii) Ostia are enclosed in porocytes
iv) Porocytes extend upto spongocoel in simple sponges
1) i, ii, iii & iv 2) i and ii only
3) ii and iii only 4) i and iv only

108. The following are the statements about Parazoa
(EAMCET -2004)
1. Includes red algae, fungi and sponges
2. Multicellular animals
3. Tissues and organ systems are present
4. Tissues and organ systems are absent
The correct combination is :
1) 1 and 3 only are correct
2) 1 and 2 only are correct
3) All are correct
4) 2 and 3 only are correct

Phylum: CNIDARIA

- Cnidarian represents- **the first 'true metazoans' (Eumetazoa)**
- Phylum coelenterata (earlier name) is derived **-due to presence of coelenteron**
- Later it is renamed as Cnidaria because of the presence of **-Cnidoblasts or cnidocytes (stinging cells)**
- Majority of cnidarians are- **marine living**
- Hydra **- A fresh water form**
- Mostly sedentary but some free swimming forms
- Cnidarians are metazoans with- **tissue grade of organization**
- They show- **diploblastic body construction**
- Body form is either hydra like- **polyp form(or umbrella like free swimming- medusa**
- Cnidarians are metazoans with- **tissue grade of organization**
- The body is radially symmetrical, seaanemones are biradially symmetrical
- The spaceous central cavity is called **-coelenteron or gastro vascular cavity**
- Coelenteron opens to exterior by mouth which functions both as **- mouth & anus**
- A separate anus is **- absent in cnidarians**
- Digestion is- **extracellular and intracellular**
- Extracellular digestion occurs in the **-coelenteron**
- Intracellular digestion occurs in the **-nutritive muscular cells of endoderm**
- Occurrence of 2 types of digestion is **- an important feature of this group**
- Cnidoblasts in body wall help in- **defence, adhesion & capture of prey**
- Special circulatory & excretory structures are **- absent**
- Sensory structures like **statocysts** occur in the medusoid forms.
- Non-polarised nerve cells form- **diffuse nerve net(non-centralised nerve net)**
- Brain is **- absent**
- Nerve impulses conduction is **diffuse conduction**.
- Sense organs like statocysts occur in **-medusoid forms**

- Asexual reproduction is by **- Fission, budding, fragmentation**
- Cnidarians are generally unisexual **(gonochoric)** but some are bisexual **(hermaphroditic)**. Fertilization is **external**. Cleavage is **holoblastic**.
- Development is **-indirect with larval stage**
- A free swimming ciliated larval stage is called **- planula**
- Life history includes **- alternation of generations (or) metagenesis**
- Phylum cnidaria is classified into **-3 classes**

Class: HYDROZOA

- These are **- Solitary or Colonial**
- Life histroy includes- **sedentary, asexual,** polypoid form & free swimming. sexual medusoid forms alternating with each other (like Obelia)
- Mesoglea is **- non-celluar**
- Cnidoblasts occur in **-ectoderm only**
- Germs cells (reproductive cells) are derived from- **ectoderm**
- Medusa is - **Crespedote** (with a velum)
- Many colonies are polymorphic with different types of **zooids** like **gastrozooids** (feeding), **dactylozooids** (defensive, prey capturing), **gonozooids** (reproductive)
- Example: *Hydra*, *Physalia* (Portuguese man of war; polymorphic) *Halistemma*; polymorphic e.g.: *Obelia* is dimorphic form (polyp and medusa stages are present)

CLASS: SCYPHOZOA

- These are commonly called **- Jelly fishes**
- They are solitary & medusoid but -polyp stage is reduced
- Medusae are **- Acraspedote** (without velum)
- The reduced polypoid stage in the developmetn is called**- Scyphistoma**
- Scyphistoma produces **- medusoid forms by strobilation and they are called as ephyra larvas**
- Mesoglea is -**Jelly like** with amoebocytes
- Gastrovascular cavity is divided into - stomach, gastric pouches, radial canals& circular canal
- Mouth is surrounded by **- four oral arms**
- Cnidocytes occur in **- ectoderm & endoderm** (on endodermal gastric filaments)
- Germ cells are derived from **- endoderm** Eg: *Aurelia* & *Rhizostoma*

Class: Anthozoa or Actinozoa:

- These are sedentary, polypoid forms commonly called- **sea aneamones**
- Mesoglea is- **cellular** & has connective tissue
- Mouth opens into - tubular **stomodaeum** (pharynx)
- Coelenteron is divded into - numerous radiating compartment by vertical, radiating septa called **mesenteries**
- The inerfree margin of mesentry is produced into - **acontium** that bears cnidocytes.
- Mouth has ciliated grooves called **-siphonoglyphs one or both the sides**
- Cnidocytes occur in **- ectoderm & endoderm**
- Germ cells are derived from **-endoderm (as in scyphozoan)**
- Some secrete a calcareous exoskeleton called a coral**- Coral reefs are formed in warmer parts of seas**

E.g: : *Adamsia* - sea anemone
Corallium - a coral animal
Gorgonia - colonial form commonly called - sea fan
Pennatula - sea pen.

PHYLUM - CNIDARIA

LEVEL-I

109. The true metazoans with diploblastic body construction, exhibiting radial symmetry are
1) Ciliates 2) Cnidarians
3) Sponges 4) All protozoans

110. A fresh water Cnidarian
1) Hydra *2) Halistemma*
3) Aurelia *4) Adamsia*

111. The jelly-like substance between epidermis & gastrodermis is called
1) Mesoglea 2) Mesoderm
3) Mesohyl 4) Mesenchyma

112. The central cavity of Cnidarians is called
1) Paragastric cavity 2) Gastrovascular cavity
3) Coelenteron 4) Both 2 & 3

113. Both extra & Intracellular digestion are found in
1) Protozoans 2) Poriferans
3) Cnidarians 4) Ciliates

114. In Hydra intracellular digestion occur in
1) Endoderm 2) Mesoglea
3) Mesoderm 4) Ectoderm

115. In Cnidarians, organs of defence, adhesion & capture of prey are
1) Cnidoblasts 2) Stinging cells
3) Cnidocytes 4) 1,2 and 3

116. Nervous system in Cnidarians is characterised by
1) presence of nerve nets with diffuse conduction
2) presence of brain
3) presence of well developed sense organs

4) unidirectional nerve impulse conduction

117. Sense organs like statocysts are present in
1) Medusoid forms 2) Polypoid forms
3) Both 1 & 2 4) Sponges

118. Unique feature of some cnidarians is
1) sedentary life 2) radial symmetry
3) polyp & medusa 4) Statocysts

119. The free swimming ciliated larva of Cnidarians is called
1) Amphiblastula 2) Planula
3) Parenchymula 4) Stereogastrula

120. Mouth leads into stomodaeum in
1) Aurelia *2) Hydra*
3) Adamsia *4) Obelia*

121. Body organization of cnidarians
1) subcellular level
2) protoplasmic level
3) organ system level 4) tissue level

122. Cnidarians with stomodaeum, without stomodaeum & mesenteries respectively are
1) Adamsia, Aurelia *2) Adamsia, Gorgonia*
3) Hydra, Physalia *4) Aurelia, Adamsia*

123. True metazoans without anus are
1) Poriferans 2) Cnidarians
3) Protozoans 4) Both 1 & 2

124 Radial symmetry of cnidarians is also called
1) Homaxial apolar
2) monaxial bipolar
3) monaxial heteropolar 4) Triaxial

125. Cnidoblasts of cnidarians are also called
1) stinging cells 2) totipotent cells
3) stem cells 4) germ cells

126. In cnidarians asexually reproducing and sexually reproducing stage respectively
1) medusa & polyp 2) polyp and medusa
3) gastrozooid and dactylozooid
4) gonozoid and dactylo zooids

127. Cnidarian that exhibits metagenesis is
1) Adamsia *2) Pennatula*
3)Obelia *4) Gorgonia*

128. Representative of polyp stage in scyphozoans is
1) planula 2) scyphistoma
3) stereo gastrula 4) paranchymula

129. Planula of cnidarians is a type of
1) non ciliated larva 2) larva with tail
3) sterogastrula 4) gastrula

130. Cnidarians in which cnidocytes occur both in ectoderm and endoderm also have this feature
1) endodermal germ cells
2) ectodermal germ cells
3) mesodermal germ cells
4) germ cells of ecto-endodermal in origin

131. Animals with endodermal body wall are the
1) parazoans 2) cnidarians
3) nematodes 4) flat worms

132. Gastrozooids are the type of zooids
1) Nutritive 2) Protective
3) Reproductive 4) 1 & 2

133. Mesenchyma not derived from mesoderm is present in these true metazoans
1) Sponges 2) Cnidarians
3) Flat worms 4) Nematodes

134. Polymorphism is seen in one of the following Cnidarian
1) Hydra *2) Fungia*
3) Physalia *4) Pennatula*

135. Germ cells are derived from ectoderm in which of the following examples
1) Hydra *2) Obelia*
3) Halistemma *4) 1,2 and 3*

136. Cnidarians with non cellular mesoglea also have this feature
1) Endodermal derived germ cells
2) Mesodermal derived germ cells
3) Ectodermal derived germ cells
4) Germ cells of both ectodermal and endodermal origin

137. In which Cnidarian, mouth is surrounded by four 'oral arms'
1) Adamsia *2) Aurelia*
3) Physalia *4) Obelia*

138. Scyphistoma of scyphozoans produces
1) polyps by budding
2) medusae by budding
3) both polyp and medusae
4) medusae by syngamy

139. Cnidarian in which mouth is surrounded by oral arms is
1) Gorgonia *2) Obelia*
3) Physalia *4) Rhizostoma*

140. Cnidoblasts occur on endodermal gastric filaments in
1) Adamsia *2) Obelia*
3) Aurelia *4) Pennatula*

141. Cnidarians in which coelenteron is divided into gastric pouches provided with gastric filaments
1) Hydrozoa 2) Anthozoa
3) Scyphozoa 4) Actinozoa

142. Which of the cnidarians do not occur in colonies
1) Hydrozoans 2) Anthozoans
3) Scyphozoans 4) Actinozoans

143. A colonial anthozoan is
1) Gorgonia *2) Obelia*
3) Hydra *4) Aurelia*

144. Symmetry seen in Anthozoans
1) Radial symmetry 2) Spherical symmetry
3) bilateral symmetry 4) biradial symmetry

145. Mesenteries of Actinozoans are
1) horizontal septa
2) vertical, radiating septa
3) septa derived from mesoderm
4) divide body into segments

146. The inner free margin of mesentry in anthozoans is produced into
1) Acontium 2) Pneumatophore
3) Rhabdites 4) Statocyst

147. Most coral forming cnidarians belong to the class
1) Hydrozoa 2) Scyphozoa
3) Anthozoa 4) Hexactinellida

148. Coral animals form coral reefs in
1) Colder parts of the seas
2) Warmer parts of the sea
3) Eastern pacific region
4) Western pacific region

149. Cnidarian which represented by only polyp form are
1) Hydrozoans 2) Anthozoans
3) Schyphozoans 4) Hexactinelids

150. Corals of cnidarians are composed of
1) calcium carbonate
2) calcium phosphate
3) silicic acid 4) proteins

151. Following is a red coral
1) *Corrallium* 2) *Pennatula*
3) *Adamsia* 4) *Gorgonia*

LEVEL - II

152. Match the following:

List - I	**List-II**
A) Gastrozooid	i) Protection
B) Dactylozooid	ii) Sexual reproduction
C) Gonozooid	iii) Nutrition
D) Medusoid form	iv) Reproduction
	v) Asexual reproduction

	A	**B**	**C**	**D**
1)	III	I	IV	II
2)	II	III	I	IV
3)	V	IV	III	I
4)	I	IV	II	III

153. Match the following:

List - I	**List - II**
A) Portuguese man of war	i) *Corallium*
B) Sea anemone	ii) *Physalia*
C) Sea pen	iii) *Gorgonia*
D) Coral animal	iv) *Pennatula*
	v) *Adamsia*

	A	**B**	**C**	**D**
1)	II	V	IV	I
2)	I	III	IV	V
3)	II	I	III	IV
4)	IV	V	II	III

154. Match the following

A) Polymorphism	i) *Hydra*
B) Oral arms	ii) *Scypha*
C) Siphonoglyphs	iii) *Aurelia*
D) Fresh water form	iv) *Physalia*
	v) *Adamsia*

1) A-iv, B-iii, C-v, D-i
2) A-v, B-i, C-iii, D-ii
3) A-iv, B-ii, C-v, D-I
4) A-iii, B-i, C-iv, D-ii

155. Match the following

A) Gastric pouches	i) *Adamsia*
B) Stomodaeum	ii) *Corallium*
C) Pneumatophore	iii) *Hydra*
D) Coral	iv) *Rhizostoma*
	v) *Physalia*

1) A-v, B-ii, C-iii, D-iv
2) A-i, B-iii, C-ii, D-v
3) A-iv, B-i, C-v D-ii
4) A-iv, B-iii, C-v, D-iii

156. Following are the statements about Anthozoans
I. Mouth bears as ciliated grooves called siphonoglyphs
II. Coelenteron is divided into many radiating compartments by mesenteries
III. Mesoglea is cellular with connective tissue
Correct combination is
1) I & II correct 2) II & III correct
3) I & III are correct
4) I, II and III are correct

157. Select the correct statements from the following regarding Hydrozoa
i) Medusoid forms reproduce asexually to produce polypoid forms
ii) Polypoid forms reproduce sexually to produce medusoid forms
iii) Medusoid forms are free swimming forms reproduce sexually
iv) Polypoid forms are sedentary reproduce asexually
1) i and ii 2)ii and iii
3) iii and iv 4) i and iv

158. Select the correct statements from the following
i) Majority cnidarians are marine
ii) All the cnidarians are radially symmetrical
iii) Mostly cnidarians are sedentary
iv) All the anthrozoans are corals
1) i and ii 2) i and iii

3)iii and iv 4) i and iv

159. Select the correct statements from the following
i) Cnidarians with non cellular mesoglea have cnidocytes in ectoderm
ii) Cnidarians exhibit polymorphism have ectodermal gemcells
iii) Cnidarians with oral arms have mesoglea with connective tissue
iv) Cnidarians with mesenteries have mesoglea with archeocytes
1) i and ii 2) ii and iii
3) iii and iv 4) i and iv

160. Select the correct statements from the following
i) Cnidarians with endodermal germ cells have cellular mesoglea
ii) Cnidarians with siphonoglyphs have cnidoblasts only in ectoderm
iii)Cnidarians with ectodermal germ cells have non cellular mesoglea
iv) Cnidarians with oral arms have cnidoblasts only in endoderm
1) i and iii 2) ii and iii
3) i and iii 4) iii and iv

161. Select the correct statements from the following
i) Coral producing cnidarians are polypoid forms
ii) Coral animals have calcium carbonate exoskeleton
iii) Coral reefs are formed in the warmer parts of seas
iv) Coral islands found in Southern pacific region
1) i, ii, iii & iv 2) i and ii only
3) All except iv 4) All except iii
1) A and R are correct R explains A
2) A and R are correct R does not explains A
3) A is correct and R is false
4) Both A and R are false

162. **Assertion (A):** Alternation of generation is also called Metagenesis.
Reason: (R): Polypoid form is asexually repro ducing form in *Obelia*

163. **Assertion (A):** Medusa is absent in Hydra
Reason (R) : In Cnidarians true mouth in the head formed for the first time

164. **Assertion (A):** Coelenteron is also called gastro vascular cavity
Reason (R) : Extracellular digestion takes place in the coelenteron and digested foods are circulated in coelenteron

165. **Assertion (A):** Free swimming ciliated larval stage called planula is seen in the development of cnidarians
Reason (R) : Free swimming larval stage in the life history of sedentary animals like cnidarians helps in dispersal of the race

166. **Assertion (A):** Nervous system of cnidarians include nerve net which is non centralized
Reason (R) : Brain is absent in the nervous system of cnidarians

167. **Assertion (A):** In cnidarians sensory structures like statocysts occur in medusoid forms
Reason (R) : Medusoid forms are free swimming forms of cnidaria

PHYLUM-PLATY HELMINTHES

- Body is **- dorso ventrally compressed**
- They are popularly called - **Flat worms**
- They show moderate - **cephalization & unidirectiona-movement associated with bilatera- symmetry**.
- They are first - **triploblastic organisms**
- They produce embryonic mesoderm **- a third germina-layer which contributes to the development of true muscle tissue**
- They are - **acoelomates (body cavity is absent)**
- The space between the gut & body wal-is filled with **- parenchyma of mesoderma-origin**
- The body shows - **organs & organ-systems leve-of body organization**
- Digestive system - **not present in some -(eg: Taenia)**
- Digestive system has - **only one opening, the mouth**
- Anus is - **absent as in cnidarians (except in turbellarians)**
- Ingestion of food & egesiton of undigested food is through- **mouth**
- Lumen of gut is comparable to gastrovascular cavity of - **cnidarians**
- Most of the food particles are phagocytized & digested intracellularly by the cells of wal-of **gastrovascular cavity like cnidarians**
- Segmentation in flat worms is **- pseudometamerism**
- Excretion is performed by specialized cells called - **flame bulbs or protonephridia**
- Flame cells primarily help in maintaining of **- osmotic balance**
- Osmoregulatory structures of platyhelminthes are - **flame cells**
- Systems absent in platyhelminthes are

- respiratory & circulatory

- Nervous system consists of a moderately developed **- brain (ganglia in the cephalic region representing a primitive brain) nerve cords**
- Nervous system in flat worms is- **ladder-like**
- Sense organs occur in **- free-living forms**
- Flat worms are mostly **- hermaphrodites**
- Fertilization is **- internal**
- Life cycle is simple or complex with - **one or more intermediate hosts & many larva-/ embryonic stages**
- Larva-/ embryonic stages of flat worms are **- miracidium, sporocyst, redia, cercaria etc**
- Polyembryony is common in some- **(eg: sporocyst stage produces many redia stages in the history of liver fluke)**

CLASSIFICATION

PHY : PLATYHELMINTHES
Class : TURBELLARIA eg. Dugesia
Class : TREMATODA eg. Fasciola
Class : CESTODA eg. Taenia
Platyhelminthes is divided into - 3 classes

Class : Turbellaria:

- Free living flatworms are **- Planarians**
- Body wal-of planarians contains - **ciliated epidermis with rod like rhabdites**
- Epidermis has rod shaped mucus forming structures called **- rhabdoids**
- Mouth is present on - **ventra-& Pharynx is eversible in the form of proboscis**
- Gastrovascular cavity of Turbellarians is - **extensively branched to supply digested foods to al-parts of body (Eg: Dugesia) but absent in other planarians**
- Turbellarians are commonly called - **Planarians**

Planarians reproduces by - **sexua-method**

- Planarians show remarkable power of - **Regeneration**

Free swimming larva-stage is called **- Muller's larva** or Goette's larva

- Planarians reproduces asexually also through **- regeneration**

Example : Dugesia (Planaria), Convoluta (acoel)

CLASS : TREMATODA

- Trematodes are commonly called - **flukes**

Al-trematodes are - **either ectoparasites (Diplozoon) or endo parasite (Fasciola)**

- Body is covered by - **tegument (neodermis)**
- Trematodes are attached to the host by - **two suckers, anterior sucker & a ventra-sucker called - acetabulum**
- Life cycle is complex with - **miracidium larva sporocyst (Parthenogenetic) redia , cercaria larva, metacercaria** (encysted juvenile)

Example: ***Fasciola hepatica*** (liver fluke), ***Schistosoma haematobium***, (blood fluke)

CLASS: CESTODA

- These are commonly called - **tape worms**
- Al-cestodes are **- parasites**
- Body covering of tape worms - **syncitial, cytoplasmic layer called tegument**
- Strobila is divided into 3 types of Proglottids - **immature, mature & gravid proglottids**
- Anterior part of body is called **- scolex with suckers & hooks**
- Organs of attachment in tape worms **- hooks & suckers**
- Gastro vascular cavity is **- absent**
- Al-cestodes are **- bisexual/ hermaprodites/monoecious**
- Basic life cycle includes - **hexacanth stage which develops into cys7ticercus larva (Extra intestina-juvenile) metacestode (e.g. cysticercus)**

Taenia solium (pork tapeworm) ***Echinococcus granulosus*** (dog tapeworm)

PHYLUM : PLATYHELMINTHES
LEVEL - I

168. First Triploblastic, bilaterally symmetrical & acoelomate animals are commonly called
1) Round worms 2) Flat worms
3) Plant-like animals
4) Proteus animalcules

169. Moderate cephalization & unidirectional movement of body is first found in
1) Hydra *2) Aurelia*
3) Flat worms *4) Typhlops*

170. The space between the gut & the body walls is filled with substance which is derived from mesoderm is
1) Parenchyma 2) Mesenchyma
3) Both 1 & 2 4) Mesoglea

171. Flame bulbs (or) Flame cells are concerned with
1) Respiration 2) Excretion
3) Digestion 4) Reproduction

172. The osmoregulatory structures of *Taenia* are
1) Kidneys 2) Metanephridia
3) Flame cells 4) Tegument

173. Term platyhelminthes was coined by
1) Gegenbaur 2) Gold fuss
3) Barenes 4) Hyman

174. Metazoans to show bilateral symmetry for the first time are
1) Roundworms 2) Flat worms
3) Sand worms 4) Earth worms

175. Animals to develop true muscles for the first time are the
1) Flatworms 2) Round worms
3) Shipworms 4) Paddle worms

176. Animals with neither primary cavity nor secondary cavity are
1) Nematodes 2) Flat worms
3) Earth worms 4) Archiannelids

177. Animals which show organ system level of organisation for the first time are
1) Platyhelminthes 2) Nematodes
3) Cnidarians 4) Annelids

178. Triploblastic animals with only mouth which serves in both ingestion and also egestion are
1) Round worms 2) Flat worms
3) Cnidarians 4) Annelids

179. Triploblastic animals with sac like organisation are
1) Cnidarians 2) Flat worms
3) both l and 2 4) Nemotodes

180. Animal with ladder like nervous system
1) Pheretima *2) Polygordius*
3) Taenia *4) Ascaris*

181. In flat worms the nephridium with terminal flame cell is described as
1) protonephridium 2) mesonephridium
3) metanephridium 4) archinephridium

182. Flat worms with mouth and with out mouth respectively are
1) Dugesia and Convoluta
2) Fasciola and Schistosoma
3) Echino coccus and Fasciola
4) Dugesia and Taenia

183. Flat worms with body covered by tegument and syncytial tegument respectively are the
1) Fasciola and Taenia
2) Dugesia an Taenia
3) Taenia and Echinococcus
4) Convolua and Taenia

184. Ciliated Epidermis with rod like Rhabdites is present in
1) Dugesia *2) Fasciola*
3) Taenia *4) Echinococcus*

185. Mucus forming structures of Dugesia are
1) Rhabdites 2) Cilia
3) Pharynx 4) Epidermis

186. In which of the following gastrovascular cavity is extensively branched to supply digested foods
1) Cestodes 2) Turbellarians
3) Round worms 4) Earthworms

187. The free-swimming larva of Turbellarians is
1) Planula larva 2) Muller's larva
3) Amphiblastula larva 4) Bipinnaria larva

188. Asexual reproduction through regeneration is present in
1) Fasciola *2) Taenia*
3) Dugesia *4) Echinococcus*

189. Free living flatworms belong to the class
1) Trematoda 2) Cestoda
3) Turbellaria 4) Nematoda

190. Muller's larva is seen in the development of
1) Dugesia *2) Echinococcus*
3) Taenia *4) Polygardius*

191. Planarians reproduce asexually by
1) budding 2) gemmetion
3) regeneration 4) binary fission

192. Free swimming larval stage of free living Flat worms is
1) Miracidium 2) Cercaria
3) Loven's larva 4) Muller's larva

193. Flat worm with proboscis which is formed by eversible pharynx is
1) Taenia *2) Fasciola*
3) Schistosoma *4) Dugesia*

194. Polyembryony is common in
1) Turbellarians 2) Trematodes
3) Cestodes 4) Both 1 & 3

195. Which larval stage of liver fluke produce many redia stages
1) Sporocyst 2) Miracidium
3) Redia 4) Cercaria

196. Flat worms which exhibit polyembryony belongs to the class
1) Turbellaria 2) Trematoda
3) Cestoda 4) Nematoda

197. Free swimming ciliated larva in the development of trematodes
1) Miracidium 2) Sporocyst
3) Redia 4) Cercaria

198. In the polyembryony of flukes
1) one redia produces many sporocysts
2) one cercaria produces many redia
3) single sporocyst produces many rediae
4) single redia produces many miracidia

199. Free swimming larval stage of certain flat worms with an ovoid body and a tail is
1) miracidium 2) sporocyst
3) redia 4) cercaria

200. Flat worm with bifurcated intestine
1) Convoluta *2) Taenia*
3) Echinococcus *4) Fasciola*

201. Flukes belong to the class
1) Tubellaria 2) Trematoda
3) Cestoda 4) Nematoda

202. Flat worms with two suckers have
1) no gut
2) bifurcated intestine
3) extensively branched gut
4) anus

203. Infective stage to man of the parasite that causes haematuria is : **EAMCET-2004**
1) Miracidium 2) Redia
3) Microfilaria 4) Cercaria

204. A platyhelminth without segments in the body
1) Taenia *2) Echinococcus*
3) Dugesia *4) Earthworm*

205. Flatworm without gastrovascular cavity
1) Convoluta *2) Fasciola*
3) Taenia *4) Dugesia*

206. Flat worms which have hexacanth larva in the development belong to the class
1) Turbellaria 2) Trematoda
3) Cestoda 4) Nematoda

207. Flat worms with hooks and hooked larval stage are the
1) Turbellarians 2) Trematodes
3) Cestodes 4) both 2 and 3

208. Hooked larval form of hooks bearing flat worms is
1) Cercaria 2) Redia
3) Hexacanth 4) Cycticerus

209. The animal in which the space between the gut and the body wall is filled with mesenchyme is **EAMCET-2003**
1) Echinodiscus 2) Enterobius
3) Eunice 4) Echinococcus

LEVEL - II

210. Following are the statements about segmentation
I) New proglottids are formed from the anterior part of the body in tapeworm
II) Tape worm shows true metamerism
III) New segments are formed in posterior region of the body in earthworm
The correct combination is
1) I & II are correct 2) II & III are correct
3) I & III are correct 4) All are correct

211. Select the correct statements from the following
i)Body wall of free living flat worms contains ciliated epidermis
ii)Body of the flukes is covered by tegument
iii)Body of tapeworms is covered by syncytial tegument
iv)Body is laterally compressed in flat worms
1)All except i 2)All except ii
3)All except iii 4)All except iv

212. Select the correct statements from the following
i)The first group of triploblastic animals are acoelomates
ii)Acoelomates show moderate cephalization and unidirectional movement
iii)Triploblastic, acoelomates show organ system level of organisation
iv)All the systems are present and well developed in Acoelomates,
1)All except i 2)All except ii
3)All except iii 4)All except iv

213. Select the correct statements from the following
i)Body wall of free living flat worms have rhabdites
ii)Flat worms with eversible pharynx have extensively branched gut.
iii) All planarians reproduce asexually by regeneration
iv)Free swimming Muller's larva seen in the life history of turbellarians
1)All except i 2)All except ii
3)All except iii 4)All except iv

214. Select the correct statements from the following
i)Flat worms with bifurcated intestine have two suckers
ii)Flat worms with sucker around the mouth are flukes
iii)Polyembryony is common in all the parasitic flat worms
iv) Life cycle is simple in flukes and it is completed in a single host
1)i and ii 2)ii and iii
3) iii and iv 4)i and iv

215. Select the correct statements from the following.
i) All tape worms are parasites
ii)Hooks and suckers are the organs of attachment in tape worms
iii)Tape worms are monoecious and show pseudometamerism
iv)In tape worms cysticercus larva develops into hexacanth
1)All except i 2)All except ii
3)All except iii 4)All except iv

216. Following are the statements about flat worms
I) Digestive system has only one opening
II) Neoblasts are totipotent cells needed for regeneration of turbellarians
III) Encycted juvenile of trematodes is metacercaria
The correct combination is
1) I & II are correct 2) II & III are correct
3) I & III are correct 4) I,II & III are correct

217. Which of the following require an invertebrate intermediate host ? **(2005 EAMCET)**
I. Dugesia II. Schistosoma
IIII. Echinococcus IV. Ancylostoma
V. Wuchereria
1) III and IV 2) II and V
3) III and V 4) I and IV

218. Arrange the following larval forms of flukes in a correct order.
a) Redia b) Miracidium
c) Cercaria d) Sporocyst
1)b-d-a-c 2)c-b-a-d
3)d-a-c-b 4)b-a-c-d

1) A and R are correct R explains A
2) A and R are correct R does not explains A
3) A is correct and R is false
4) Both A and R are false

219. **Assertion (A)**: Body of turbellarian is covered by epidermis whereas in trematodes and cestodes, it is covered by tegument.
Reason: (R) : Turbellarians are free living, whereas trematodes and cestodes are endoparasites.

220. **Assertion (A)** : Triploblastic animals with sac like organisation have only mouth and without anus
Reason (R) : First triploblastic animals with sac like organisation are protostomes

221. **Assertion (A)** : True musculature for the first time developed in flat warms
Reason (R) : Flat worms are the first animals to have mesoderm

222. **Assertion (A)** : Flat worms are the first triploblastic animals to show unidirectional locomotion
Reason (R) : Flat worms are the first animals to have distinct cephalization

223 **Assertion (A)** : Alimentary canal is absent in the flat worms which belong to the class cestoda
Reason (R) : Cestodes are intestinal parasites, which can absorb predigested food from the host

PHYLUM : NEMATODA

- Nematoda is coined by - **Gegenbaur**
- "Nema" means - **thread**
- Nematoda includes - **round worms or thread worms**
- Nematodes live in all types of habitats like soil and water as - **Freeliving organisims**
- Nematodes as parasites live on **- Plants and animals**
- Pseudocoelomate, protostomes, triploblastic & bilaterally symmetrical worms are - **nematodes**
- Body of Nematodes is without - **segments**
- The unique feature of nematodes is- **the presence of collagenous cuticle**
- Epidermis of nematodes is - **syncytial (formed by the fusion of many cells)**
- Muscles present in body wall are - **longitudinal muscles (circular muscles are absent)**
- Structures absent in nematodes are - **circular, muscles, cilia, blood vascular system, flame cells**.
- Body cavity or perivisceral space is formed by - **a remnant of embryonic blastocoel**
- Body cavity is' not considered a true coelome because - **it is not entirely enclosed by mesoderm**
- The fluid of body cavity which provides hydrostatic skeleton to the organism is - **pseudocoelomic fluid**
- Pseudocoelomic fluid acts as - **Hydrostatic skeleton and also helps in circulation**
- Alimentary canal is simple with two openings - **mouth at anterior end & anus at the posterior end**
- In male nematodes alimentary canl and genital organs jointly open to the exterior by - **Cloacal aperture**
- Wall of digestive tract lacks - **muscle layer**
- A simple layer of Endoderimal cells is present in - **wall of digestive tract**
- Absorption of digested foods into pseudocoelomic fluid becomes easy in Nematodes because - **of absence of mesodermal musculature in digestive tract**.
- Absence of circulatory system is compensated by - **the presence of pseudocoelomic fluid which transports nutrients though out the body.**

- Excretion occurs by gland like structure called - **renette gland and canals**
- Nervous system is - **intraepithelial** in the epidermis and gut.
- Nervous system of Nematodes has **- a circum enteric ganglionated nerve ring with nerves extending both anteriorly and posteriorly.**
- Chemo receptors of the anterior region of the body are called Amphids
  Glandulo sensory structure present on posterior side - phasmids
- Nematodes exhibit a clear - **sexual dimorphism**
- Males are generally - **smaller & with a posteriorly curved end**
- Cloaca with one or two copulatory spicules or penial spicules are found in - **male nematodes**
- Female nematodes are - **longer; genital pore and anus are separate**
- Majority of Nematodes are - **oviparous (Ascaris)**
- Few of Nematodes are - **ovo-viviparous (Wuchereria)**
- Fertilization is - **internal**
- Growth of Nematodes involve
  - **four moults of cuticle**

It is classified into two classes

1) Aphasmidia

- Phasmids are absent
- Amphids are highly modified
- Excretory system is poorly developed
- Aphasmids are - **Trichinella (trichina worm); Trichocephalus (whip worm);**

2) **Phasmidia**

Phasmids are present

- Amphids are pore-like
- Excretory system is well developed

Example: Ascaris (common round worm), Wuchereria (filarial worm), Ancylostoma (hook worm), Enterobius (pin worm).

Comparison of Salient Features of Nematode Group

Character	APHASMIDIA	PHASMIDIA
Amphids	Highly modified	Simple
Phasmids	Absent	Present
Excretory system	Poorly developed	Well developed
Examples	Trichinella Trichocephalus	Ascaris, Wuchereria, Ancylostoma, Enterobius

PHYLUM - NEMATODA

LEVEL- I

224. Triploblastic, bilaterally symmetrical, pseudocoelomate protostomians are
1) Flat worms 2) Round worms
3) Earthworms 4) Tape worms

225. Nematodes are characterised by
1) triploblastic body
2) species-specific number of nuclei
3) presence of locomotory cilia
4) with longitudinal and circular muscles in the body wall

226. Nematodes are without
1) Cilia, Flame cells & Mouth
2) Cilia, Flame cells & Circular muscles
3) Cilia, Circular muscles & Anus
4) Flame cells, mouth & Anus

227. Excretory canals of round worms are
1) A shaped 2) H shaped
3) T shaped 4) S shaped

228. In Nematodes, Amphids are
1) Chemoreceptors of anterior region of body
2) Chemoreceptors of posterior region of body
3) Chemoreceptors of lateral sides of body
4) Chemoreceptors of Ventro-lateral-sides of body

229. In Nematodes phasmids are located at
1) Posterior region of body
2) Anterior region of body
3) Posterior region of head
4) syncytial tegument

230. Glandulo-sensory, secretory or excretory structures of Nematodes are
1) Plasmids 2) Phasmids
3) Amphids 4) Plastids

231. In the absence of blood vascular system, the nutrients from gut circulate in the body of nematodes through
1) pseudocoelomic fluid 2) H.Shaped canal
3) amphids 4) phasmids

232. Number of moults occur in the life cycle of Nematodes is
1) One time 2) Three times
3) Four times 4) Many times

233. Spiny structures that help in copulation present near the cloacal aperture of male Nematodes are called.
1) Phasmid 2) Amphids
3) Penial stalks 4) Penial setae

234. Multinucleate cytoplasm without cell walls
1) Coenocytic 2) Syncitial
3) Both 1 and 2 4) Karyocytic

235. Animal without cilia from the following
1)Ascaris *2)Adamsia*
3)Dugesia *4)Gorgonia*

236. One of the following acts as a hydrostatic skeleton in Nematodes
1) Pseudocoelom 2) Pseudocoelomic fluid
3) Collagenous cuticle 4) Muscle layer

237. Body wall of Nematodes contains only
1) Circular muscles 2) Longitudinal muscles
3) Radial muscles 4) Transverse muscles

238. Fertilization is internal in
1) Ascaris only *2) Wuchereria only*
3) Trichinella only 4) All Nematodes

239. The term nemathelminthes was coined by
1)Hyman 2)Von siebold
3)Gegenbaur 4)Barnes

240. Body is covered by collagenous protective cuticle in
1)Taenia solium *2)Fasciola*
3)Echinococcus granulosus *4)Ascaris*

241. In nematodes body is covered by
1) ciliated epidermis 2) tegument
3) syncytial tegument 4) syncytial epidermis

242. Perivisceral cavity is not a true coelom in
1)flat worms 2)round worms
3)annelids 4)chordates

243. Tube with in tube organisation for the first time is seen in
1)flatworms 2)sand worms
3)round worms 4)ship worms

244. Which of the following set of parasites exhibit sexual dimorphism.
1)Fasciola, Taenia and Convoluta
2)Ascaris, Enterobius and Ancylostoma
3)Musca, Periplaneta, & Pheretima
4)Hirudinaria, Pediculus and Cimex

245. Ovoviviparous nematode parasite
1)Ascaris *2)Ancylostoma*
3)Enterobius *4)Wuchereria*

246. Male nematodes can be identified from the female in having
1)Pineal setae, external gonopore and anus
2)Copulatory spicules and large size body
3)Penial setae, cloacal aperture and curved tail
4)Straight tail, anus and gonopore

247. Gland like structure that help in excretion in nematodes is
1)green gland 2)antennary gland
3)ink gland 4)renette gland

248. Which of the following are absent in round worms and present in some flatworms.
1)Longitudinal muscles,and mouth
2)Flame cells, mouth and cilia
3)Cilia, flame cells and suckers
4)Cilia, flame cell and longitudinal muscles

249. Nematode with poorly developed excretory system is
1) Pinworm 2) Trichina worm
3) Filarial worm 4) Round worm

250. Nematods with highly modified amphids are the
1)Enterobius and Ancylostoma
2)Ascaris and Wuchereria
3) Trichinella and Trichocephalus
4)Ascaris and Ancylostoma

251. Nemotodes with simple amphids have
1)well developed circulatory system
2)less developed reproductive system
3)poorly developed excretory system
4)well developed excretory system

252. Nematodes with poorly developed excretory system have
1)simple amphids
2)well developed phasmids
3)highly modified amphids
4)poorly developed phasmids

253. Nematodes with well developed excretory system
1) Ascaris & Ancylostoma
2) Trichinella & Ancylostoma
3) Trichinella & Trichocephalus
4) Wuchereria & Trichinella

254. Characteristic feature of the class in which *Ascaris* is included is
1)Modified amphids 2)Presence of phasmids
3)Absence of phasmids 4)Complex amphids

255. Copulatory bursa is present in
1)male *Ascaris* *2)female Enterobius*
3)male *Ancylostoma* *4)female Wuchereria*

LEVEL - II

256. Following are the statements about Digestive tract of Nematoda
I) Wall of digestive tract has a single layer of endodermal cells only
II) Mesodermal musculature is absent.
III) Absorption of digested food into pseudocoelomic fluid becomes difficult
Correct combination is
1) I & II are correct 2) I & III are correct
3) II & III are correct 4) All are correct

257. Select the correct statements from the following
I) Excretory system is poorly developed in tri-

china worm and well developed in round worm
II) Amphids are simple in hook worm and highly modified in whip worm
III) Phasmids are absent in pinworm but present in trichina worm
1) i and ii 2) ii and iii 3) i and iii 4) all

258. Match the following:

List-I	List - II
A) *Enterobius*	I) Round worm
B) *Ascaris*	ii) Hookworm
C) *Ancylostoma*	iii) Trichina worm
D) *Trichinella*	iv) Pinworm
	v) Filarial worm

	A	B	C	D
1)	IV	I	III	II
2)	I	II	IV	V
3)	IV	I	II	III
4)	II	I	IV	V

259. Assertion (A): Male nematodes are generally smaller with curved posterior end
Reason (R): They possess a cloaca & one or two copulatory spicules or penial spicules.
1) Both A & R are correct, R is correct explanation to A
2) Both A & R are correct, R is not correct explanation to A
3) A is correct, R is false
4) Both A & R are flase

PHYLUM - ANNELIDA
GENERAL CHARATERS

- The term Annelida was proposed by - **Lamarck**
- In Latin Annulus means - **Ring**
- Segmented worms - **Annelids**
- Linneaus placed all invertebrates except insects in the taxon - **Vermes**
- Annelids and Arthropods are kept under the taxon Articulata by - **Cuvier**
- Bilaterally symmetrical, triploblastic segmented coelomate invertebrates are - **Annelids**
- Cephalisation, Digestive glands, circulatory system, True coelom and metemerism were first developed in - **Annelida**
- Annelids are - **Mostly aquatic, a few are terrestrial and parasitic**
- Most distinguished feature of Annelida - **Homonomous metamerism**
- Linear division of body into ideally similar parts each with a set of representatives of all the systems - **Metamere**
- Each ring like segment of Annelid is called - **Metamere**
- (**a**)Extenally segments are seperated by- **inter segmental grooves**
- **(b)** Internally annelid segments are separated by - **Septa**
- **(c)** New segments in annelids formed in the region just in front of the - **Anal segment or pygidium**
- The growth zone located just in front of the pygidium is called - **teloblastic growth zone**
- Body of Annelids is divided in to - **Prostomium, trunk, pygidium**
- Symmetry in Annelida - **Bilateral**
- Body wall - **Dermo muscular**
- Body covering - **Cuticle**
- Coelom - **Schizocoel**
- Coelom formed by the splitting of mesoderm **- Schizocoel**
- In Each segment the no of coelomic cavities- **1 pair**
- Coelomic cavities are seperated by **-Dorsal and ventral mesenteries**
- Cephalization is more pronounced in Annelids with distrinct **- Head, bearing tentacles, Eyes and Concentration of Nervous system at the anterior end.**
- Locomotory structures in annelids are **- Setae, parapodia and Suckers**
- Setae in annelida are made up of- **Chitin**
- Blood vascular system in annelida is - **Closed type**
- Polychaeta means- **Numerous setae**
- Respiratory pigment in Annelida- **Haemoglobin dissolved in plasma**
- Respiratory pigment in some polychaetes includes - haemoerythrin (pink or violet) and chlorocruorin (green)
- Organs of excertion - **Metanephridia**
- Nephridia originate from**-Ectoderm**
- Nervous system in Annelida - **Nerve ring with brain and ganglionated double ventral nerve cord**
- Sensory organs are - **Eyes, Tentacles & palps**
- Sexuality- **Mostly unisexual, some are bisexual**
- Fertilization- **External, except in Leeches**
- Development in Annelids- **Indirect or direct**
- Development in Monoecious (Bisexual) annelids is **- Direct**
- Development in Dioecious (Unisexual) Annelid is **- Indirect**
- Cleavage - **Spiral, holoblastic and deter-**

minate

- Larva - **Trochophore**
- During metamorphosis the larval **episphere (pretrochal region)** becomes **- Prostomium** the larval part posterior to the **telotroch** be comes **- pygidium.**

Trunk segments develop from - **growth zone** anterior to telotroch.

POLYCHAETA

- Polychaetes are commonly called - **Bristle worms**
- Most of the polychaetes are - **Marine**
- Annelids with distinct head bearing simple eyes, tentacles & palps - **Polychaeta**
- Organs of Locomotion in Polychaetes are - **Parapodia (Biramous appendages) with many setae**
- Clitellum in polychaete - **absent**
- In polychaetes the gamates are shed into the coelom and they leave the body through **- Nephridia or by rupturing the body wall.**
- Gonads are present in - Most of the segments

  Gonoducts in polychaeta are - **absent**
- Sexuality- **Unisexual**
- Fertilization **- External**
- Larva - **Trochophore Larva**

Eg:

COMMON NAME	***SCIENTIFIC NAME***
SAND WORM	*NERIES*
PALOLOWORM	*EUNICE*
SEAMOUSE	*APHRODITE*
PADDLEWORM	*CHETOPTERUS*
LUGWORM	*ARENICOLA*

OLIGOCHAETA

- Oligochaeta means- **Less number of setae**
- Oligochaetas are- **Terrestrial and Fresh water and marine forms**
- Annelids without head and parapodia but with less number of setae- **Oligochaeta**
- Eyes are **absent** but **photoreceptors** are present in the epidermis
- Permanent clitellum is present in - **Oligochaeta**
- Clitellum produces a cocoon during **- Breeding season**
- Gonads are present in - **Few genital segments**
- Sexuality - **Bisexual**
- Site of Fertilization - **Clitellum or Cocoon**
- Development - **Direct, Without larval stages**

Eg:

NAME	***DISTRUBUTION/ COMMON NAME***
MEGASCOLEX	SOUTH INDIA
PHERETIMA	MOST COMMON INDIAN EARTHWORM
LUMBRICUS	BRITISH EARTHWORM
TUBIFEX	FRESHWATER OLIGOCHAETA

Drawida grandies - LONGEST EARTHWORM

HIRUDINIEA

- Leeches belongs to the class - **Hirudinea**
- Marine, fresh water or terrestrial,
- Blood sucking ectoparasitic annelids on Vertebrates - **Leeches**
- A class of Annelids without Parapodia, Head & Setae- **Hirudinea**
- The number of segments in the the body of Hirudineans is - **Definite**
- Extrenally Segments shows sub-divisions called **- Annuli**
- Internal segmentation and mesenteries are **- Absent**
- Locomotory organs are Anterior and posterior suckers
- Ocelli in Hirudinea **- Present**

  Setae and parapodia **- absent**
- Clitellum in Hirudinea is - **conspicuous only during breeding season**
- Coelom is filled with an excretory tissue called **- Botryoidal tissue**
- Gonads - **Confined to few genital segments**
- Sexuality - Copulating **Hermaphrodite**
- Male reproductive system of Hirudinea posses copulatory structure called **- Penis (Cirrus)**
- Fertilization - **Internal**
- Development - **Direct**
- Development is completed in - **Cocoon**

Eg: **Indian Cattle Leech *(HIRUDINARIA)***
British Leech *(HIRUDO MEDICINALIS)*
Land Leech *(HAEMADIPSA)*
Skate Sucker *(PONTOBDELLA)*

According to different authors Botryoidal issue is either excretory or nutrient storing tissue

At present Annelida is classified into two taxa - Polychaeta and Clitellata (girdle worms). Clitellatta includes Oligochaeta and Hirudinea

ANNELIDA
GENERAL CHARACTERS
LEVEL-I

260. The first triploblastic schizocoelomates are
  1) Platyhelminthes 2) Nemathelminthes
  3) Annelida 4) Arthropoda
261. Cephalization and true metamerism first appeared in
  1) Platyhelminthes 2) Nematoda
  3) Annelida 4) Arthropoda
262. The term 'Annelida' was coined by
  1) Linnaeus 2) Lamarck

3) Lankester 4) Leuckart

263. Segmented, soft bodied worm like, bilaterally symmetrical animals are
1) Mollusca 2) Cnidaria
3) Annelids 4) Porifera

264. Metameric segmentation is seen in
1) Cnidarians 2) Poriferans
3) Annelids 4) Platyhelminthes

265. The body wall of Annelids is
1) Non muscular
2) Dermo muscular body wall
3) Without dermis
4) Non-cuticular

266. During the metamorphosis of a trochophore larva the episphere develops into
1) Prostomium 2) Trunk
3) Pygidium 4) Pretrochal region

267. Unisexual Annelids release their gametes through
1) Vasdeferens 2) Gonoducts
3) Oviduct 4) Metanephridia

268. The animals that developed the functional blood vascular system for the first time are
1) Arthropods 2) Molluscs
3) Cephalopods 4) Annelids

269. In Annelids Growth results from the addition of new segments from
1) Protroch 2) Teloblastic growth zone
2) Meta troch 4) Episphere

270. Trochophore larva occurs during the development of
1) Annelids and Arthropods
2) Arthropods and Molluscs
3) Annelids and Molluscs
4) Molluscs and Echinoderms

271. Closed type of blood vascular system is present in
1) Annelida and Arthropoda
2) Oligochaeta and Insecta
3) Cephalopoda and Annelida
4) Mollusca and Echinodermata

272. The organ system which is absent in Annelida
1) Respiratory system
2) Excretory system
3) Nervous system
4) Digestive system

273. Body cavity in Annelids is
1) Pseudocoel 2) Schizocoel
3) Enterocoel 4) haemocoel

274. Hydraulic skeleton in Annelids is
1) Setae
2) Pseudocoelomic fluid
3) coelomic fluid
4) Ossicles

275. Straight muscular alimentary canal with digestive glands in its wall is present in
1) Platyhelminthes
2) Nemathelminthes
3) Annelida
4) Arthropoda

276. Respiratory pigments in the blood of annelids are
1) Haemoglobin and haemocynanin
2) Haemoglobin, Chlorocruorin and Haemoerythrin
3) Haemocyanin and Chlorocruorin
4) Haemoerythrin and Chlorocruorin only

277. In annelida cleavage is
1) Holoblastic and Radial
2) Holoblastic and spiral
3) Meroblastic and Radial
4) Meroblastic and spiral

LEVEL-II

278. ***Assertion (A):*** For the first time formation of distinct head in the animal kingdom is reported in annelida
Reason (R): Annelids exhibit metameric segmentatation
1) Both A and R are true and R is the correct explanation to A
2) Both A and R are true but R is not the correct explanation to A
3) A is true R is false
4) Both A and R are false

279. ***Assertion (A):*** In Annelida digestion is extra cellular
Reason (R) :digestion occurs in the lumen of alimentary canal of Annelids
1) Both A and R are true and R is the correct explanation to A
2) Both A and R are true but R is not the correct explanation to A
3) A is true R is false
4) Both A and R are false

280. Study the following statements regarding Annelids.
I. Metameric segmentation is present
II. Closed type of blood vascular system is present
III. Excretion takes place by Coxalglands
The correct combination is
1. Only I and II are correct
2. Only II and III are correct
3. Only I and III are correct
4. All are correct.

281. The classes of phylum Annelida with setae are
1) Polychaeta, Oligochaeta
2) Hirudinea, Archiannelida
3) Polychaeta, Hirudinea
4) Oligochaeta, Archiannelida

282. Annelids without distinct head belongs to the class
1) Oligochaeta 2) Hirudinea
3) Polychaeta 4) Both 1 and 2

283. The Annelids with direct development belongs to the class
1) Oligochaeta, Hirudinea
2) Polychaeta, Oligochaeta
3) Archiannelida, Hirudinea
4) Polycheata, Archaeannelida

284. At present the taxon Clitellata includes
1) Polychaeta and Oligochaeta
2) Polychaeta and Hirudinea
3) Oligochaeta and Polychaeta
4) Oligochaeta and Hirudinea

POLYCHAETA

LEVEL-I

285. A class of Annelids with parapodia
1) Oligochaeta 2) Hirudinea
3) Polychaeta 4) Archiannelida

286. Aphrodite, Arenicola belongs to the class
1) Hirudinea 2) Polychaeta
3) Oligo chaeta 4) Archiannelida

287. The characteristic larva of Polychaeta
1) Planula 2) Trochophore
3) Lovens 4) Ephyra

288. Chlorocruorin and Haemoerythrin are respiratory pigments seen in some
1) Oligochaetes 2) Archiannelids
3) Polychaetes 4) Hirudinarian

289. The annelids with distinct head, eyes, tentacles and palps
1) Leeches 2) Earthworms
3) Polychaetes 4) Myriapods

290. Unisexual Annelid among the following is
1) Hirudunaria 2) Hirudo
3) Pheretima 4) Nereis

291. Lunar periodicity is exhibited in the reproduction of
1) Paddleworm 2) Lug worm
3) Nereis 4) Paloloworm

292. Locomotory structures in polychaeta are
1) Parapodia without setae
2) Parapodia with some setae
3) Parapodia with many setae
4) Only setae

293. The gill like structures in some polychaetes are
1) Vascularised parapodia
2) Ctenedia
3) Palps
4) Branchiae

294. The most diverse group of Annelids are
1) Polychaetes 2) Oligochaetes
3) Hirudinians 4) Archiannelids

LEVEL-II

295. Match the following and choose the correct combination

List-I	**List-II**
a. *Nereis*	i. Lug worm
b. *Aphrodite*	ii. Paddle worm
c. *Chaetopterus*	iii. Sea mouse
d. *Arenicola*	iv. Sand worm
	v. Palalo worm

	A	**B**	**C**	**D**
1.	V	IV	III	I
2.	I	III	IV	V
3.	IV	III	II	I
4.	I	II	III	IV

296. ***Assertion (A):*** In Polychaeta Gonoducts are absent
Reason (R) : Indirect development is seen in Polycheata
1) Both A and R are true and R is the correct explanation to A
2) Both A and R are true but R is not the correct explanation to A
3) A is true R is false
4) Both A and R are false

297. Study the following statements regarding Polychaetes
I. Clitellum is present
II. Head is distinct with eyes tentacles and papls
III. Gonoducts are absent
1) Only I and II are correct
2) Only I and III are correct
3) Only II and III are correct
4) I, II & III

298. Read the following statements about polychaeta
I. Locomotary organs are parapodia with many setae
II. They are hermaphrodites
III. Development is indirect with a trochophore larva
1) I, II are correct 2) I, III are correct
3) II, III are correct 4) I, II, III are correct

299. **Assertion (A):** In Nereis, gametes are shed into the coelom and leave the body through nephridiopores
Reason (R): In Nereis, Gonoducts are absent
1) Both A and R are correct and R is the correct explanation of A
2) Both A and R are correct, but R is not the correct explaniation of A
3) A is true but R is false
4) Both A & R are false

OLIGOCHAETA
LEVEL-I

300. Clitellum is present through out the life in
1) Polychaeta 2) Oligochaeta
3) Hirudinea 4) Archiannelida
301. Example for a freshwater oligochaete
1) Tubifex 2) Pontobdella
3) Nereis 4) Arenicola
302. Locomotary organs in oligochaeta are
1) Setae 2) Suckers
3) Setae and parapodia
4) Parapodia and suckers
303. Bisexual annelids with few setae are included in
1) Polychaeta 2) Oligochaeta
3) Hirudinea 4) Archiannelida
304. Tubifex and chaetogaster belong to the class
1) Archiannelida 2) Polychaeta
3) Hirudinea 4) Oligochaeta

HIRUDINEA
LEVEL-I

305. A class with distinct number of segments in the body
1) Hirudinea 2) Oligochaeta
3) Polycheaeta 4) Archiannelida
306. Botryoidal tissue is seen in
1) Neries 2) Chaetogaster
3) Pheretima 4) Hirudinaria
307. Annelids with internal fertilization are
1) Polychaetes 2) Leeches
3) Earthworms 4) Archiannelids
308. Which is applicable to Hirudinea
1) Presence of two suckers
2) Absence of head and parapodia
3) Presence of distinct number of segments
4) All
309. Males possess a copulatory organ called cirrus in
1) Hirudinea 2) Oligochaeta
3) Archiannelida 4) Polychaeta

LEVEL-II

310. Study the following statements regarding Hirudineans
I. Indefinite number of segments are present
II. Internal segmentation is almost absent
III. Clitellum is formed during breeding season
The correct combination is
1) Only I and II are correct
2) Only II and III are correct
3) Only I and III are correct
4) I, II & III
311. ***Assertion (A):*** Fertilization in Hirudinaria is internal
Reason (R): In Hirudinaria males possess a copulatory structure called cirrus
1) Both A and R are true and R is the correct explanation of A
2) Both A and R are true but R is not the correct explanation of A
3) A is true but R is false
4) Both A & R are false
312. Read the following statements about leeches
I. Coelom is reduced due to the presence of botryoidal tissue
II. They show a copulatory organ called penis
III. Locomotary organs are setae and parapodia
Identify the correct statement (S)
1) I, II, III 2) II, III only
3) I and II only 4) I, III only

PHYLUM - ARTHROPODA
GENERAL CHARACTERS

The term Arthropoda was coined by - **Von Siebold**

- The relationship between arthropods and annelids was recognised by - **Cuvier and Lankester**
- Arthropods are separated out as a distinct phylum by - **Leuckart**
- 'Arthropoda' means- **Jointed feet**
- Largest Phylum in the animal kingdom - **Arthropoda**
- Distribution - **Cosmopolitan**
- Arthropoda accounts for **80%** of animal species
- Symmetry in Arthropoda - **Bilateral**
- Arthropods are - **Triploblastic, heteronomous metamerically segmented animals with chitinous exoskeleton and jointed appendages.**
- Arthropods are characterised by - **Tagmosis**

The three tagmata are - Head, Thorax and

Abdomen

- Muscles of Arthropods are **striated**

Outer covering of the body or exoskeleton - **Chitinous cuticle & Protein**

- Shedding of exoskeleton - **Moulting or Ecdysis** which facilitates **Growth**
- Segmentation - **Heteronomous metarmerism**
- In the evolution of Arthropods there is **- Increasing cephalisation with the incorporation of more segments in the head and concentration of nervous control and sensory perception in the head region.**
- Haemocoel is not a true but a cavity derived from the embryonic **- Blastocoel**
- In arthropods true coelom is confined to spaces of - Gonads & saccate nephridia

The body spaces through which the blood (Haemolymph) moves **- Haemocoel**

- Alimentary canal is with three regions
- Respiration in small crustaceans - gaseous exchange across the general body surface.

Large aquatic arthropods respire through - gills and book gills.

Terrestrial arthropods respire through - **tracheae and book lungs**

- Circulatory system - **Opentype, no blood vessels**
- Position of heart - **Dorsal**
- Respiratory pigment - **if present is mostly haemocyanin (few with haemoglobin)**
- Copper containing respiratory pigment is - **Haemocyanin**
- Nervous system in Arthropoda- **Nerve ring with Brain and ganglionated, Double ventral nerve cord**
- Receptors - **compound eyes, simple eyes, Bristles, anal cerci, Statocyst, Antenna, etc.**
- Organs of excretion in aquatic arthropods- **Saccate nephridia (Green glands andCoxal gland)**

In terrestrial arthropods - **Malphigian tubules**

- Sexuality- **Mostly Unisexual**
- Fertilization - **External or Internal in aquatic forms; only internal in terrestrial forms**
- Development - **indirect or direct**
- Clevage - **Meroblastic and superficial**
- Growth of the body from - **Teloblastic growth zone**
- Eggs-**Centrolecithal**

CLASSIFICATION OF ARTHROPODA

- Arthoropoda is divided into three sub-**phyla-Trilobita - Chelicerata - Mandibulata**

SUB-PHYLUM-I :: TRILOBITA

- Fossil Arthropods abundant during the Paleozoic era and now extinct.
- Body is divided into a median and two lateral lobes by two prominent longitudinal axial furrows, hence the name -**Trilobita (Trilobitomorpha)**

Divisions of Body in Trilobita - **Head, Abdomen, and Pygidium**

- Head of Trilobites bears - **one pair of Anetenna and compound eyes**

In Trilobita appendages are - **Biramous**

- Appendages do not show any specialisation or structural differentiation into mouth parts - **a Primitive feature of trilobites.**

Examples : *Triarthrus, Dalmanites*

SUB PHYLUM - II :: CHELICERATA

- In chelicerata, the anterior six segmented parts is - **Cephalothorax or Prosoma**
- In Chelicerata the posterior thirteen segmented abdomen is - **Opisthosoma**
- Abdomen is divided into **- Mesosoma and Metasoma**
- Antennae are - **Absent**
- The Anterior most appendages are modified as - **Chelicerae**
- **Metasoma** is with a **telson**

CLASS-I XIPHOSURA

- No. of Prosomal appendages - **6 pairs**

One pair of **chelicerae**; four pairs of **walking legs** and one pair of **pusher legs.**

- Eyes are -Median ocellus and A pair of lateral compound eyes
- First pair of **Mesosomal appendages** are fused to form **Genital operculum** and other five pairs are modified as **- Book gills**
- **Excretory organs** are **coxal glands**
- Development **- Indirect**
- The larva of Limulus **- Trilobite**

Eg: ***Limulus***

- Limulus has remained unchanged structurally over million of years so it is called **- Living Fossil.**

CLASS - II :: ARACHNIDA

- Terrestrial chelicerates belong to - **Arachnida**
- Prosoma bear - **A pair of preoral chelicerae and a pair of postoral pedipalps and four pairs of walking legs.**

In spiders each chelicera bears a fang into which

a poison gland opens.

- Abdominal appendages are modified into **Book lungs, spinnerets in Spiders and pectines in scorpion**
- Respiratory organs in scorpions - **Book lungs**
- Respiratory organs in spiders - **Book lungs or tracheae or both.**
- Excretory organs are - **Coxal glands and Malpighian tubules.**
- Development is - **Direct**
- Scorpions are - **Viviparous**

Eg: ***Palamnaeus*** **(Scorpion)**
Aranea **(Spider)**
Sarcoptes **(Mite)**

SUB - PHYLUM - III :: MANDIBULATA

- In this group the first pair of mouth parts are **- Mandibles**
- The first pair of appendages are - **Antennae**

CLASS - I :: CRUSTACEA

- Crustaceans are-**mostlyAquatic marine arthropods**
- In most species head and thorax unite to form **- Cephalothorax**
- Cephalic appendages are 5 pairs - **one pair of first antennae (antennules) one pair of second antennae, one pair of mandibles, one pair of first maxillae and a pair of second maxillae**
- The only arthropods with two pairs of antennae are **- Crustaceans**
- In Crustaceae, thoracic and abdominal appendages are typically **- Biramous**
- Respiratory structures in crustacea are **- Gills**
- Excretory organs in crustacea are **- Green glands or Antennal glands**
- Sense organs include - **statocysts, compound eyes and antennae.**
- Gonopores are **paired**
- Development is **Direct or Indirect**
- Basic larva is **nauplius**

Ex: ***Palaemon*** (freshwaer prawn)
Balanus (rock barnacle)
Sacculina (root headed barnacle)
Astacus (cray fish)
Cancer (crab)
Daphnia (water flea)

CLASS - II CHILOPODA or TRIGNATHA

- This class includes the **Centipedes**
- These are terrestrial and carnivorous
- These are **trignathic** - with mandibles, first maxillae and second maxillae
- Body is divisible into **head** and **trunk**
- Each segment of the trunk bears - **one pair of clawed legs**
- First pair of trunk appendages bear - **poison claws**
- Respiratory organs - **Tracheae**
- Excretory organs - **Malpighian tubules**
- The condition in which a single genital aperture occurs at the posterior end of the trunk is - **Opisthogoneate**
- Development is **direct or indirect**

Eg: ***Scolopendra, Scutigera***

CLASS - III :: DIPLOPODA or DIGNATHA

- The common name of the animals belonging to this class are **- Millipedes (thousand-legged worms)**
- Diplopods are **- Terrestrial and Detritivorous**
- Diplopodans feed on - **Decaying plant material**
- Body is divisible into- **Head, Thorax and Abdomen**
  They are **Dignathic,** with **mandibles and gnathochilarium (formed by the fusion of second maxillae).**
- Trunk segments are - **diplosegments,** formed by the fusion of two segments during development.
- Each diplosegment has - 2 pairs of legs, 2 pairs of spiracles
- The masticatory structure formed due to the fusion of 'maxillae' is - **Gnathochilarium.**
- Respiration takes place by - **Tracheae**
- Excretion takes place by - **Malphigian tubules**
- The condition in which single genital aperture opens in the anterior part of the trunk is- **Progoneate**
  Development is **indirect**

Eg : ***Spirobolus, Julus***

CLASS - IV :: INSECTA or HEXAPODA

- Insects are absent in - **Marine environment**
- Body is divided into - **Head, Thorax and Abdomen**
- In Insecta head is made up of - **six segments**
- Thorax bears three pairs of jointed legs, hence it is referred as **- Hexapoda**
- Respiratory structures are **- Tracheae**
- Excretory structures are- **Malphigian tubules**
- The main nitrogenous excretory waste is **- Uric acid (Uricotelism)**
- The least toxic nitrogenous waste and can be

sent out of the body in a highly concentrated form with minimum water loss (water conservation adaptation) - **Uric acid**

Development is - **Indirect**

Larval stages are - **Present**

Metamorphosis - **occurs**

Eg :- *Musca* - **Housefly**

Lepisma - **Silverfish**

Pediculus - **Headlouse**

Periplanata - **Cockroach**

ADDITIONAL INFORMATION :-

Chilopoda and Diplopoda are included under - **Myriapoda**

Myriapoda and Hexapoda are grouped under the Infraphylum - **Tracheata**

PHYLUM - ARTHROPODA
GENERAL CHARACTERS
LEVEL -I

313. The most common respiratory pigment in arthropods is
1) Haemocyanin 2) Haemoglobin
3) Haemoerythrin 4) Absent

314. Number of tagmata in arthropods is
1) 5 2) 3 3) 4 4) 6

315. The shedding - off of the exoskeleton is known as
1) Heterogamy 2) Ecdysis
3) Cephalization 4) Paedogenesis

316. Excretory organs of Terrestrial arthropods are
1) Malphigian tubules 2) Coxal glands
3) Green glands 4) Antennary glands

317. Cleavage in Arthropods is
1) Holoblastic and spiral
2) Meroblastic and Superficial
3) Meroblastic and Spiral
4) Teloblastic and Sprial

318. Exoskeleton in Arthropoda is formed by
1) Chitinous Cuticle 2) $CaCO_3$
3) Pellicle 4) Absent

319. Group of animals with jointed legs
1) Helminthes 2) Echinodermata
3) Coelenterata 4) Arthropoda

320. The biggest phylum with reference to the number of species
1) Arthropoda 2) Chordata
3) Platyhelminthes 4) Protozoa

321. Which of the following sub phylum has most highly evolved Arthropods
1) Onychophora 2) Mandibulata
3) Chelicerata 4) Trilobita

322. Respiration through trachea, book gills, book lungs are seen in
1) Mollusca 2) Arthropoda
3) Echino dermata 4) Annelida

LEVEL-II

323. Study the following statements regarding Arthropods
I. Arthropods undergo ecdysis to facilitate growth
II. Like Annelids they show teloblastic growth.
III. Planula larva is present
1) Only I and II are correct
2) Only II and III are correct
3) Only I and III are correct
4) I,II,III are correct

324. Read the following statements about respiration in Arthropods
I) Respiratory organs are Gills, Book gills, Book lungs and Trachea
II) Very small crustaceans respire through general body surface
III) Aquatic arthropods respire through trachea and Book lungs
Identify the <u>incorrect</u> statements
1) I and II 2) II and III
3) Only II 4) Only III

SUB-PHYLUM-I :: TRILOBITA
LEVEL-I

325. Triarthrus and Dalmanites are characterised by the presence of
1) Head with out compound eyes
2) Two tagmata
3) Biramous and specialised appendages
4) Two longitudinal axial furrows

326. Trilobites were abundant during
1) Mesozoic era 2) Paleozoic era
3) Coenozoic era 4) Proterozoic era

327. Habitat of Trilobites is
1) Only marine 2) Marine and Fresh water
3) Only Freshwater 4) Terrestrial

328. Biramous appendages are present in
1) Trilobita and Crustacea
2) Crustacea and Arachnida
3) Myriapoda
4) Crustacea and Millepedes

329. Body is trilobed in
1) Dalmanites 2) Daphnia
3) Lepas 4) Balanus

LEVEL-II

330. The following are the statements about Trilobita.
I. Early arthropods abundant in palaeozoic era
II. Head bears antennae and compound eyes
III. Uniramous appendages are only present

1) I,II,III are true
2) Only I and II are true
3) Only II and III are true
4) Only I and III are true.

331. ***Assertion (A):*** Dalmanites is considered as a Trilobita arthropod
Reason (R): Dalmanites show 3 pairs of legs
1) Both A and R are true and R is the correct explanation to A
2) Both A and R are true but R is not the correct explanation to A
3) A is true R is false
4) Both A and R are false

CLASS-I XIPHOSURA

LEVEL-I

332. The generic name of horseshoe crab is
1) Sarcoptes 2) Limulus
3) Thelyphonus 4) Lepisma

333. The first pair of mesosomal appendages in limulus are fused to form
1) Book gills 2) Gnathochilarium
3) Genital operculum 4) Book lungs

334. The larva of limulus is
1) Trilobite larva 2) Nauplius larva
3) Planula larva 4) Muller's larva

335. Presence of chelicerae is one of the characters of
1) Dalmanites 2) Sacculina
3) Cimex 4) sarcoptes

336. Trilobite larva is seen in the life cycle of
1) Triarthrus 2) Limulus
3) Aranea 4) Eurypterus

337. The number of prosomal and mesosomal appendages in Limulus respectively are
1) 5 pairs, 6 pairs 2) 6 pairs, 6 pairs
3) 6 pairs, 5 pairs 4) 1 pair, 5 pairs

LEVEL-II

338. **Assertion (A):** Development in Limulus is Indirect
Reason (R): Development of Limulus show Trilobite larva
1) Both A and R are true and R is the correct explanation to A
2) Both A and R are true but R is not the correct explanation to A
3) A is true R is false
4) Both A and R are false

CLASS - II :: ARACHNIDA

LEVEL-I

339. Respiration through trachea, book gills, book lungs are seen in
1) Crustacea 2) Arachnida
3) Centipedes 4) Millipedes

340. Legs in arachnida are
1) 6 2) 4 3) 8 4) 10

341. Pectines of scorpion are modified
1) Cephalic appendages
2) Abdominal appendages
3) Thoracic appendages
4) Cephalothoracic appendages

342. Ticks and Mites belong to
1) Crustacea 2) Arachnida
3) Merostomata 4) Chelicerata

343. Scorpion, spider can be differentiated as Arachnids by
1) 4 Pairs of legs
2) 3 Pairs of legs
3) Presence of sensory organs
4) Presence of wings

344. Number of segments in prosoma of Arachnids
1) 4 2) 5 3) 6 4) 13

345. Antennae are absent in
1) Heterometrus 2) Balanus
3) Lepisma 4) Triarthrus

LEVEL-II

346. The following are the statements about Arachnida
I. Presence of four pairs of legs.
II. Prosoma is made up of 6 segements
III. Second pair of appendages are chelicerae
The correct combination is
1) I,II,III are correct
2) I and II are correct
3) I and III are correct
4) II and III are correct

347. Study the following
A. It is a terrestrial Arthropod
B. The prosoma bears a pair of chelicerae, a pair of the pedipalps and four pairs of walk ing legs.
C. The mesosoma ends in a telson
D. First pair of walking legs are modified as poisonous claws.
Which of the above are true for Palamnaeus?
1) A and C 2) A and B
3) A and D 4) C and D

348. Match the following

List-I	List-II
A. Sarcoptes	I Prawn

B. Palamnaeus II.Scorpion
C. Palaemon III. Mite
D. Aranea IV. Spider

	A	B	C	D
1.	III	I	II	IV
2.	III	II	I	IV
3.	II	III	I	IV
4.	IV	III	II	I

349. Identify the wrong combination
1. Pectines - Modified abdominal appendages
2) Book lungs - Respiratory organs of scorpions
3) Telson -Excretory organ of scorpions
4) Viviparous - Scorpions

CLASS - I :: CRUSTACEA

LEVEL-I

350. Paired gonopores are present in the class
1) Crustacea 2) Arachnida
3) Hirudinea 4) Oligochaeta
351. 2 pairs of Antennae are present in the class
1) Arachnida 2) Insecta
3) Myriapoda 4) Crustacea
352. Which of the following are present only in Crustacea
1) Antennae 2) Mandibles
3) Maxillae 4) Antennules
353. A parasite on Crab is
1) Daphnia 2) Lepas
3) Balanus 4) Sacculina
354. In Crustacea. excretion is carried out by
1) Coxal glands 2) Preen glands
3) Green glands 4) Kidney
355. The basic larva of Crustaceans is
1) Megalopa 2) Nauplius
3) Alima 4) Zoea
356. Head in Crustaceans is formed by the union of
1) 4 segments 2) 5 segments
3) 6 segments 4) 3 segments
357. Organs of respiration in Crustaceans are
1) Trachea 2) Book lungs
3) Book gills 4) Gills

LEVEL-II

358. The following are the statements about Crustacea
I. All are fresh water
II. Head bears five segments
III. Gills are the respiratory organs
The correct combination is
1) I,II,III are correct
2) II and III are true
3) I and II are true
4) I and III are true

359. Match the following

List-I	List-II
A. Astacus	I. Crab
B. Cancer	II. Root headed barnacle
C. Daphnia	III. Water flea
D. Sacculina	IV. Cray fish
	V. Rock barnacle

	A	B	C	D
1.	IV	I	III	II
2.	IV	I	III	V
3.	I	IV	III	II
4.	I	III	II	IV

360. The cephalic appendages of palaemon are
1) 1 pair of chelicerae, 1 pair of pedipalps, 4 pairs of walking legs
2) 2 pairs of Antennae, 1 pair of mandibles, 2 pairs of maxillae
3) 1 pair of chelicerae, 1 pair of Antennae, 4 pairs of walking legs
4) 1 pair of Antennae, 1 pair of mandibles, 2 pairs of maxillae

CLASS - II CHILOPODA or TRIGNATHA

LEVEL-I

361. 'Scolopendra' belongs to the class
1) Diplopoda 2) Chilopoda
3) Insecta 4) Arachnida
362. Number of Appendages in each trunk segment of scutigera are
1) 1 pair 2) 2 pairs
3) 3 pairs 4) Absent
363. Trignathic mandibulates belong to the class
1) Arachnida 2) Crustacea
3) Chilopoda 4) Diplopoda
364. Opisthogoneate condition is seen in
1) Scutigera 2) Sacculina
3) Spirostreptus 4) Sarcoptes
365. In Scolopendra the poisonous claws are modified structures of
1) I pair of legs 2) II pairs of legs
3) III pairs of legs 4) IV pairs of legs

LEVEL-II

366. ***Assertion (A):*** In Scolopendra respiration takes place through tracheael system
(R): Scolopendra is seen in fresh water
1) Both A and R are true and R is the correct explanation to A
2) Both A and R are true but R is not the correct explanation to A
3) A is true R is false
4) Both A and R are false

367. ***Assertion (A):*** Scolopendra is opisthogoneate
Reason (R): Scolopendra has single gonopore at the posterior end of the trunk
1) Both A and R are true and R is the correct explanation to A
2) Both A and R are true but R is not the correct explanation to A
3) A is true R is false
4) Both A and R are false

CLASS - III :: DIPLOPODA or DIGNATHA

LEVEL-I

368. In each diplosegment, the number of legs and spriacles is
1) One pair of legs and one pair of spiracles
2) One pair of legs and two pairs of spiracles
3) Two pairs of legs and two pairs of spiracles
4) Two paris of legs and one pair of spiracles
369. Gnathochilarium in *Julus* is formed by the fuseon of
1) Mandibles 2) I Maxillae
3) II maxillae 4) Antennae
370. Excretory organs of *Spirobolus*
1) Malphigian tubules 2) Coxal glands
3) Green glands 4) Nephridia
371. *Spirobolus* belongs to the class
1) Diplopoda 2) Crustacea
3) Insecta 4) Arachnida
372. Progoneate condition is found in
1) *Scolopendra* 2) *Sacculina*
3) *Spirobolus* 4) *Sarcoptes*

LEVEL-II

373. ***Assertion (A):*** Millipedes exhibit progoneate condition
(R): A single genital aperture is present at anterior part of the trunk in Millipedes
1) Both A and R are true and R is the correct explanation to A
2) Both A and R are true but R is not the correct explanation to A
3) A is true R is false
4) Both A and R are false
374. Read the following statements about millipedes and Identify the correct statements
I. They are dignathic with mandibles and gnathochilarium
II. They are terrestrial and carnivorous
III. They are progoneate
1) I,II 2) II, III 3) I, III 4) I, II, III

CLASS - IV :: INSECTA or HEXAPODA

LEVEL-I

375. Which is a true hexapod
1) Star fish 2) Devil fish
3) Silver fish 4) Cuttle fish
376. Appendages which are present in Hexapoda but absent in Arachnida
1) Antennae 2) Compound eyes
3) Chelicerae 4) Pedipalps
377. The body of insects is divisible into Head, thorax and abdomen they are made up of segments respectively
1) 6,4,11 2) 6,3,10
3) 6,4,12 4) 7,4,13
378. Lepisma belongs to the class
1)Crustacea 2) Myriapoda 3)Arachnida
4) Insecta

LEVEL-II

379. The following are the statements about Insecta
I. Three pairs of legs
II. Tracheae are the respiratory organs
III. Absent in marine habitat
1) I,II,III are true
2) Only I and III are true
3) Only I and II are true
4) Only II and III are true.

PHYLUM :: MOLLUSCA

GENERAL CHARACTERS:

- Soft bodied triploblastic, bilaterally symmetrical, unsegmented schizocoelomates are - **Molluscs**
- True coelomate unsegmented soft bodied animals - **Mollusca**
- Study of mollusca - **Malacology**
- Second largest phylum - **Mollusca**
- Study of Molluscan shells - **Choncology**
- Jonston created the name Mollusca for - **cephalopods and barnacles**
- The classification which was revised and first to include modern views was published by **Cuvier**
- Molluscan shells show variation in - **Size, shape, colour and architecture**
- Mollusca are either - **mostly marine.**
- Some gastropods and bivalves live in **freshwater .**
- Some gastropods are terrestrial
- Cultured pearls are produced by Pinctada vulgaris(source of foreign exchange earning)
- Molluscs are - **Triploblastic animals**
- Normal divisions of body in Mollusca- anterior

head, dorsal visceral mass & ventral foot

- Fold of skin enclosing the soft body - **Mantle or pallium**
- Space between mantle and visceral mass is called **- mantle cavity or pallial cavity**
- Mantle cavity contains **gills, ospharidium, anus, nephridiopores, and gonopores.**
- Coelom is reduced and the primary body cavity is **haemocoel,** composed of several large sinuses of the **open blood vascular system.**
- True coelom in mollusca is restricted organs **- Pericardial cavity, gonads and kidney**
- A secretory product of Mantle is - **Shell**
- Outer most layer of the shell is composed of a protein called **- Conchiolin**
- **T**he inner two layers of the shell are composed of **calcium carbonate.**
- Chief organ of Locomotion in Mollusca is **- Muscular foot**
- Foot less mollusca - **Aplacophora, oysters**
- Symmetry in Mollusca - **Bilateral**
- Asymmetry in Gastropoda is due to **- Torsion**
- Shell less mollusca - **Aplacophora, Octopus, slugs**
- Mollusca with internal shell - **Sepia, Loligo, Aplysia**
- Rasping organ (or) Masticatory organs - **Radula**
- Molluscs without Radula **- Pelecypoda or Bivalvia**
- Mollusca with a crystalline style secreting amylase in the stomach - **Pelecypoda or Bivalvia and some gastropods**
- The cavity into which digestive, excretory and reproductive systems open in Mollusca - **Mantle cavity**
- Respiratory organ in aquatic molluscs **- Ctenidia**
- Respiration in Terrestrial forms **- Pulmonary sac formed by mantle**
- Circulatory system in molluscs - **Open type except Cephalopoda**
- Chambers in the Heart - **one pair of atria and one ventricle.**
- Heart **is systemic heart -** atria receive oxygenated blood from the gills and ventricle pumps blood to haemocoelomic sinuses through blood vessels.
- Blood pigment in molluscs - **Copper containing bluish Haemocyanin**
- Excretory organs - **Metanephridia or Kidneys**
- Kidneys of Mollusca open into pericardial cavity through - **nephrostome**
- They open into exhalent chamber of mantle cavity through **- nephridiopores**
- Peculiarity of nervous system in mollusca **- several pairs of ganglia connected by commisures and connectives**
- A nerve joining similar ganglia **- commisure**
- A nerve joining dissimilar ganglia - **connective**
- Receptors in mollusca-
  a) eyes(photoreceptors)
  b) tentacles(tangoreceptors)
  c) osphradium helps in testing quality of water and amount of sediment in water.
  d) statocyst(balancing organ)
- Sexuality in mollusca - **majority are unisexual**
- Most common larva **- trochophore**
- In most species, it develops into - **veliger larva** Veliger larva is with a velum, useful in swimming
- Development is indirect in some
- Phylum Mollusca is classified into - **seven classes**

CLASS :: APLACOPHORA

- The class of mollusks which are worm like primitive forms without shell and nephridia **- Aplacophora**
- Foot if present is a fold that lies in - **pedal groove**
- Class with calcarious spicules in the cuticle is **- Aplacophora**
- Respiratory organs are one pair of gills in ***Chaetoderma*** and secondary gills in ***Neomenia.***
- Ladder like nervous system is present in **- Aplacophora**
- **Podocytes** occuring on the **pericardial wall** help in **excretion** in the absence of nephridia
- Development is direct or indirect
  Eg: ***Neomenia, Chaetoderma***

CLASS :: POLYPLACOPHORA

- This class includes - **Chitons**
- The class of mollusca with a dorsal shell formed by eight transvers plates - **Polyplacophora**
- Gills in Polyplacophora - **six to eighty eight pairs**
- Nervous system is **ladder like but without ganglia**
- Development is **indirect** with **trochophore larva**
  Eg: Chiton, Lepidopleurus

CLASS :: MONOPLACOPHORA

- The class of primitive molluscs which was thought to be extinct until 1952 but live forms were recovered by Galathea off the Pacific coast of Costa Rica- **Monoplacophora (Galathea is an oceanographic research vessel)**
- Shell in Monoplacophora is - **Single and plate like**
- Foot is broad and flat
- Excretion and respiration is by - **3 to 7 pairs of nephridia and 3 to 6 pairs of gills**
- **Internal segmentation** or **serial repitition** of internal organs in several system is one of the striking feature in Monoplacophorans
- Heart is unique with - **Two pairs of auricles which opens into two ventricles**
- **Eg** ***Neopilina***

CLASS :: GASTROPODA

- **Largest and most diverse molluscan class**
- Includes - s**nails, slugs** and **limpets**
- Belly footed and soft bodies animals -**Gastropoda**
- Asymmetrical mollusks - **Gastropods**
- Torsion in gastropoda occurs in the visceral mass of - **Veliger**
- Head in gastropods bear - **Eyes, tactile and chaemoreceptor tentacles**
- Foot in gastropoda is - **Flat creeping sole**
- Shell in gastropoda - **Spirally coiled, univalve and external**
- Shell less gastropod - **Slugs**
- Shell is internal in - **Aplysia**
- Chief organ of respiration - **Ctenidium**
- Only class of mollusca which includes marine, fresh water terrestrial and parasitic forms - **Gastropoda**
- **Only left nephridium, atrium and gill** are present in most of the living gastropods
- Radula is - **Present**
- Asymmetry is due to asymmetrical development of - **Torsion**
- Torsion is due to asymmetrical development of - **Shell muscles of veliger larva**

Eg:

Common name	**Generic name**
Apple snail	**Pila**
Limpet	**Patella**
Cowrie	**Cypraea**
Sea hare	**Aplysia**
Grey slug	**Limax**
Sea lemon	**Doris**
Land Snail	**Helix**

CLASS :: SCAPHOPODA

- Elephant tooth shells or tusk shells belong to the class _ **Scaphopoda**
- Molluscs with a tubular shell slightly curved and open at both end - **Scaphopoda**
- Foot in Scaphopoda - **long and conical digging organ**
- Atria and gills in Scaphopoda - **Absent**
- Two lobes on either side of the head bearing a large number of threadlike structures are - **Captaculae**
- Structures which help in capture of food - **Captaculae**
- Larva - **Veliger**

Eg: ***Dentalium, Pulsellum***

2.8 PHYLUM :: MOLLUSCA

CLASS :: PELECYPODA or BIVALVIA or LAMELLIBRANCHIATA

Includes mussels, oysters, shipworms and scallops.

- A class of mollusca with a bivalved shell and axe like foot - **Pelecypoda**
- Shell in Pelecypoda is formed by - **Right and left valves**
- Head,eyes,tentacles,jaws and radula in Pelecypoda - **Absent**
- Foot is - **Wedge shaped**
- Organs of respiration in Pelecypoda- **one pair of Plate like ctenedia (Lamellibranchiae)**
- Type of feeding - **Suspension feeders or filter feeders**
- The structure present in stomach which help in digestion of starches - **Crystalline style**
- Sexuality - **Mostly unisexual**
- Most common larval form of marine Pelecypods - **Trochophore and Veliger**
- In Mytilus the thread like structure which help in help in attaching to the substratum - **Byssus threads**
- Larva of freshwater forms like unio which is an ecto parasite on the gills of fishes and is specialised veliger is called - **Glochidium**

Eg:

Common name	**Scientific name**
Fresh water mussel	***Unio***
Indian pearl oyster	***Pinctada***
Sea mussel	***Mytilus (attaches to substratum with byssus threads)***
Shipworm (or)	***Teredo***
Scallop	***Pecten***

CLASS :: CEPHALOPODA
(or) Siphonopoda

- Cephalopoda includes - **Nautilus,cuttle fishes,squids,octopuses**
- Most advanced or highly evolved class in Mollusca - **Cephalopoda**
- Highly predacious fast swimming carnivorous molluscs - **Cephalopoda**
- Foot in cephalopoda is modified into **- 8-10 arms with suckers and siphon**
- Shell less Cephalopod - **Octopus**
- Cephalopods with internal shell - **Loligo**
- A cephalopod with an external spirally coiled,multichambered shell - **Nautilus**
- Heart in Cephalopoda - **One ventricle and 2 to 4 auricles(myogenic)**
- Shell of sepia is commonly called - **Cuttle bone**
- Shell of Loligo is commonly called - **Pen**
- The gland which provide defensive adaptation **- Ink gland**
- In Cephalopoda ctenidia are - **Dibranchiate in Sepia, Tetrabranchiate in Nautilus**
- Development in Cephalopoda - **Direct**

Eg:

Common Name	**Scientific name**
Cuttle fish	***Sepia***
Sea squid (or) Sea arrow	***Loligo***
Giant squid	***Architeuthis***

(Largest invertebrate, largest eyes in the animal kingdom)

Monoplacophora, Gastropoda, Scaphopoda, Bivalvia and Cephalopoda constitute the taxon **Conchifera**

MOLLUSCA GENERAL CHARACTERS:

LEVEL-I

380. "Molluscs" means
1) Soft bodied 2) Hard bodied
3) Soft skinned 4) Hard skinned

381. Nervous system in most of Mollusca is
1) With out ganglia
2) With paired ganglia and connectives and commissures
3) With paired ganglia without connectives and commissures
4) Ladder like without connectives

382. Which of the following system in mollusca opens into mantle cavaity
1) Digestive system 2) Excretory system
3) Reproductive system 4) All of the above

383. Function of crystalline style in some molluscans is
1) Respiration 2) Digestion
3) Excretion 4) Mastigation

384. Osphradium is a
1) Sense organ
2) Structure in circulatory system
3) Genital organ 4) Respiratory organ

385. Radula is a/an
1) Organ of defence 2) Excretory organ
3) Rasping organ 4) Reproductive organ

386. The second largest phylum in animalia
1) Annelida 2) Arthropoda
3) Mollusca 4) Echinodermata

387. The study of molluscan shells
1) Malacology 2) Conchology
3) Carcinology 4) Cnidology

388. Respiratory pigment in Molluscans is
1) Haemoglobin 2) Haemocyanin
3) Haemoerythrin 4) Chlorocruorin

389. The most common larva of Molluscans is
1) Trochophore 2) Planula
3) Brachiolaria 4) Bipinnaria

390. Haemocyanin is the respiratory pigment in
1) Annelida 2) Arthropoda
3) Mollusca 4) Arthropoda and Mollusca

391. Ship worm is
1) Pholas 2) Teredo
3) Pinctada 4) Patella

LEVEL-II

392. Read the following statements about Mollusca and Identify the correct statements
I. The coelom in Molluscans is haemocoel
II. Heart of Molluscans is a systemic heart
III. Respiratory organs of Molluscans are ctenidia
1) I, II, III 2) I and II only
3) II and III only 4) I and III only

393. Match the following

List-I	List-II
A. Molluscan with Multichambered external shell	I. Octopus
B. Molluscan with out shell	II. Nautilus
C. Molluscan with 2 valved shell	III. Unio
D. Molluscan with internal shell	IV. Aplysia

	A	**B**	**C**	**D**
1.	III	I	II	IV
2.	II	I	III	IV
3.	I	II	III	IV
4.	IV	I	III	II

394. Arrange the following parts in a sequence according to the flow of blood

a) Atria b) blood vessels c) gills
d) ventricles e) Haemocoelomic sinuses

1) $c \rightarrow a \rightarrow d \rightarrow b \rightarrow e$
2) $d \rightarrow b \rightarrow c \rightarrow a \rightarrow e$
3) $e \rightarrow c \rightarrow b \rightarrow d \rightarrow a$
4) $a \rightarrow b \rightarrow c \rightarrow d \rightarrow e$

CLASS :: APLACOPHORA

LEVEL-I

395. Worm like body is present in
1) Aplacophora 2) Polyplacophora
3)Gastropoda 4)Cephalopoda

396. Foot is a fold that lies in the pedal groove in
1) Neomenia 2) Neopilina
3) Unio 4) Chiton

397. In these molluscs the skin is covered by cuticle with calcareous spicules
1) Pelecypoda 2) Scaphopoda
3) Aplacophora 4) Gastropods

398. Excretory organs of Neomenia are
1) Nephridia 2) Podocytes
3) Flamecells 4) Malphigian tubules

LEVEL-II

399. The following are the statements about the class "Aplacophora".
I) Shell is absent II) Foot is groove like
III)Larva is Glochidium
1) I,II,III are true
2) Only I and II are true
3) Only II and III are true
4) Only I and III are true

CLASS :: POLYPLACOPHORA

LEVEL-I

400. 6-88 pairs of Ctenidia are present around foot ventrally in
1) Polyplacophora 2) Pelecypoda
3) Monoplacophora 4) Scaphopoda

401. The number of plates present in the shell of Polyplacophora is
1) Eight 2) Ten 3) Six 4) Four

402. Lepidopleurus belongs to : **(EAM-2005)**
1) Polyplacophora 2) Echinoidea
3) Cephalopoda 4) Asteroidea

403. Larva of chiton is
1) Veliger 2) Glochidium
3) Trochophore 4) Muller larva

404. Shell of chiton is
1) A univalve 2) Made up of 8 plates
3) Made up of 4 plates 4) Bivalve

LEVEL-II

405. The following are the statements about the class Polyplacophora
I) Shell consists of eight plates II) Larger number of gills III) Larva is Glochidium
The Correct combination is
1) I,II,III are true
2) Only I and II are true
3) Only II and III are true
4) Only I and III are true

CLASS :: MONOPLACOPHORA

LEVEL-I

406. Living fossil molluscan belongs to the class
1) Polyplacophora 2) Aplacophora
3) Monoplacophora 4) Gastropoda

407. Molluscan with segmentally arranged body parts is
1) Neopilina 2) Neomenia
3) Chaetoderma 4) Chiton

408. Number of chambers in the heart of Neopilina
1) 2 Atria and 1 ventricle
2) 1 Atria and 1 ventricle
3) 4 Atria and 2 ventricle
4) 4 Atria and 4 ventricle

409. Which of the following animals is not only a living fossil but also considered as connecting link ? **(EAM-2007)**
(1) Sphenodon (2) Limulus
(3) Neopilina (4) Latimeria

410. The number of gills and nephridia respectively in monoplacophorans are
1) 5 - 6 pairs, 6 pairs 2) 6-8 pairs, 6 pairs
3) 1-2 pairs, 6 pairs 4) 1-6 pairs, 6 pairs

LEVEL-II

411. The following are the statements about the class "Monoplacophora"
I)Shell is bivalve
II) Visceral mass shows internal segmentation
III) Represented by Unio
The correct combination is
1) Only II is true
2) Only II and III are true
3) Only I and II are true
4) Only I and III are true.

412. Identify the mismatch regarding *Neopilina*
1) Foot - Broad and flat
2) Nephridia - 6-88 pairs
3) Gills - 3 - 6 Pairs
4) Shell - Limpet like

Gastropoda

LEVEL-I

413. One of the following is a mismatch
1) Pecten - Scallop 2) Aplysia - sea hare
3) Limax - slug
4) Pila - cowrie

414. Belly footed animals
1) Gastropoda 2) Cephalopoda
3) Scaphopoda 4) Pelecypoda

415. Symmetry in gastropoda is
1) Spherical 2) Assymetry
3) Radial 4) Bilateral

LEVEL-II

416. Identify the correct answer from the choices given below:
Assertion: (A) : All protostomians are symmertrical except adult gastropods
Reason (R) : Gastropods exhibit torsion
1) Both A and R are true and R is the correct explanation to A
2) Both A and R true and R is not the correct explanation to A
3)A is true R is false
4) Both A and R are false

417. The following are the statements about the gastropods
I) Exhibit torsion during development
II) Live in more than one habitat
III) Head is reduced
1) I,II,III are true
2) Only II and III are true
3) Only I and II are true
4) Only I and III are true

418. **Statement (S) :** In many gastropods, the anus and the mantle cavity are placed anteriorly above the head.
Reason (R) : During embryonic development, in many gastropods one side of the visceral mass grows faster than the other side. This uneven growth rotates the visceral organs upto 180^0 in many gastropods.
The correct answer is **(EAM-2008)**
1) Both (S) and (R) are true and (R) explains (S)
2) Both (S) and (R) are true but (R) cannot e plain (S)
3) Only (S) is correct but (R) is wrong
4) Both (S) and (R) are wrong.

419. Match the following

Scientific name	common name
A. Aplysia	I. Slug
B. Limax	II. Sea lemon
C. Doris	III. Limpet
D.Patella	IV. Sea hare

	A	B	C	D
1.	II	III	IV	I
2.	IV	I	II	III
3.	IV	II	III	I
4.	III	II	IV	I

CLASS :: SCAPHOPODA

LEVEL-I

420. In Scaphopoda
1) Tentacles are well developed
2) Tentacles are absent
3) Atria are absent
4) Tentacles and Atria are absent

421. Captacula are found in
1) Pila 2) Dentalium
3) Unio 4) Chiton

LEVEL-II

422. The following are the statements regarding "Elephant tusk shells"
I) They are the members of class Scaphopoda
II) They are without gills
III) They have cone like foot
The correct combination is
1) I,II,III are true 2) All are false
3) Only I and II are true
4) Only II and III are true

423. The coelom of the animals which are com monly known as "tooth shells" orginates **(EAM-2005)**
1) By enterocoelic method
2) By Schizocoelic method and filled with coelomic fluid
3) By splitting of embryonic mesoderm and filled with the blood
4) From the blastocoel

CLASS :: PELECYPODA or BIVALVIA or LAMELLIBRANCHIATA

LEVEL-I

424. Ship worm is
1) Pholas 2) Star fish
3) Solen 4) Teredo

425. Pelecypods are characterized by the absence of
1) Gills 2) Head 3) Radula 4) 2 & 3

426. Marine mussel is
1) Nautilus 2) Dentalium
3) Mytilus 4) Unio

427. Axe shaped foot is found in
1) Gastropoda 2) Scaphopoda

3) Pelecypoda 4) Cephalopoda

428. The larva of freshwater bivalvian which lives as ectoparasite on the gills of fishes is
1) Glochidium 2) Veliger
3) Trochophore 4) Nauplius

LEVEL-II

429. Identify the correct answer from the choice given below:
Assertion (A): Radula is absent in Pelecypoda
Reason (R): Animals under pelecypoda are filter feeders
1) Both A and R are true and R is the correct explanation to A
2)Both A and R true and R is not the correct explanation to A
3) A is true R is false
4) Both A and R are false

430. The following are the statements about "Pelecypoda"
I) Shell is bivalved II) Radula is present in the alimentary canal III) Crystalline style is present
The correct combination is
1) All are true 2) Only I and III are true
3) Only II and III are true
4) Only I and II are true

431. The following are the statements regarding "Pearl secreting Molluscs"
I) belong to class cephalopoda
II) have crystalline style in the alimentary canal
III) have wedge shaped foot
The correct combination is
1) Only II is true
2) Only I and II are true
3) Only II and III are true
4) Only I and III are true

432. Read the following statements about *Mytilus* and identify the correct statements
I. It is a marine mussel which attaches to the substratum with byssus thread
II. Radula is present
III. Foot is blade like adapted for digging
1) I,II,III 2) I,II
3) II,III 4) I,III

CLASS :: CEPHALOPODA
(or) Siphonopoda

LEVEL-I

433. Mollusca with closed type of blood vascular system
1) Gastropoda 2) Pelecypods
3) Cephalopoda 4) Polyplacophora

434. Which of the following is a "giant squid"?
1) Patella 2) Murex
3) Architeuthis 4) Loligo

435. The generic name of "Squid"
1) Unio 2) Teredo
3) Pinctada 4) Loligo

436. Distinct head with well developed eyes comparable to vertebrates found in
1) Aplacophora 2) Gastropoda
3) Cephalopoda 4) Pelecypoda

437. Loligo, Octopus, Nautilus and Sepia are examples for the class
1) Gastropoda 2) Cephalopoda
3) Scaphopoda 4) Pelecypoda

438 Ink glands in sepia help in
1) Respiration 2) Excretion
3) Defence 4) Reproduction

LEVEL-II

439. ***Assertion (A):*** All molluscs except cephalopods are with open type of circulatory system
(R): Cephalopods have 2 to 4 auricles & 1 ventricle in the heart.
1) Both A and R are true but R is the correct explanation to A
2) Both A and R are true but R is not the correct explanation to A
3) A is true R is false
4) Both A and R are false

440. The following are the statements regarding "Cephalopoda"
I) Highly evolved molluscs
II) Foot is modified into arms which bear suckers
III) Eyes are well developed
The correct combination is
1) Only II is true
2) Only I and II are true
3) Only II and III are true 4) All are true

441. Read the following statements about sepia
I. It belongs to the class cephalopoda
II. It's internal shell is called pen
III. Brain is protected by cartilagenous cra nium
Identify the correct statements
1) I,II 2) II, III
3) I,III 4) I, II, III

442. Match the following

Scientific name	Common name
A. Octopus	I. Cuttle fish
B. Sepia	II. Squid
C. Loligo	III. Gaint squid
D. Architeuthis	IV. Devil fish

	A	B	C	D
1.	IV	I	II	III
2.	I	IV	II	III
3.	II	III	I	IV
4.	III	II	I	IV

443. The taxon conchifera includes
1) Monoplacophora, Aplacophora, polyplacophora
2) Monoplacophora, Gastropoda, Scaphopoda, Bivalvia, Cephalopoda
3) Gastropoda, Pelycypoda
4) Scaphopoda, cephalopoda

2.9 PHYLUM :: ECHINODERAMATA
GENERAL CHARACTERS

- The term Echinodermata was proposed by - **Jacob Klein**
- The term 'Echinodermata' means - **Spiny skin**
- Echinoderms with other invertebrates were placed under mollusca by - **Linneaus**
- Echinoderms with colenterata were included under Radiata by - **Lamarck**
- Echinoderms were identified as distinct taxon by - **Frey and Leuckart**
- Phylum in which all animals are exclusively marine - **Echinodermata (except Synapta similis which lives in brackish water)**
- Echinoderms are - **Bottom dwellers and benthic**
- A group of triploblastic animals with pentamerous radial symmetry - **Echinodermata**
- Phylum with bilateral symmetry in the larval forms and Pentaradial symmetry in adult forms - **Echinodermata**
- Coelom in Echinodermata is - **Enterocoelic coelom**
- Parasites in Echinodermata are - **Absent**
- Headless, Brainless, True coelomate invertebrates - **Echinodermata**
- Body of Echinoderms is distinguished into - **Oral and aboral surfaces**
- Feeding in Echinoderms - **Herbivores (or) carnivores**
- Pincer like organs useful for cleaning - **Pedicellariae**
- Endoskeleton consists of **calcareous ossicles** in the **dermis**
- Location of mouth mostly on the - **Oral surface**
- Location of anus- **mostly on the aboral side**
- Most distinguished feature of echinoderms - **Water vascular (or) Ambulacral system** derived from **coelom**
- Organs of locomotion and food collection, gas exchange and excretion - **Tube feet**
- Special outgrowths of body wall useful in gas exchange are - **papulae, genital bursae, peristomial gills and respiratory trees**
- Blood vascular system - **Open and poorly developed.**
- Excretion takes place through - **Tube feet and papulae. No special organs of excretion are present.**
- Nitrogenous waste in echinoderms is - **Ammonia**
- Central nervous system consists of - **circum oral nerve ring and radial nerves**
- **Peripheral nervous system** consists of **two nerve nets,** one in the epidermis and the other in the coelomic epithelium.
- Nervous system lacks **ganglia**
- Sexuality - **Unisexual**
- Fertilization is - **External**
- Cleavage is **radial and indeterminate**
- Development is - **Indirect**
- Larvae- **Planktonic and Bilaterally symmetrical**
- Hypothetical larva of Echinoderms- **Dipleurula**
- Many species exhibit **autotomy and** have remarkable power of **regeneration**

CLASSIFICATION

- Echinodermata is divided into two subphylas - **Pelmatozoa, Eleutherozoa**

SUB PHYLUM - PELMATOZOA

- Oral surface is **upward**
- Mouth and Anus is present on the **oral surface**.
- Madreporite is **absent**
- Ambulacral grooves are **open**

CLASS : CRINOIDEA

- Sealillies and feather stars belong to the class - **Crinoidea**
- Sessile crinoides with a stalk and cirri are - **Sealilies**
- Free swimming crinoides with out stalk and with cirri- **Feather stars**
- Arms in Crinoidea - **Five dichotomously branched (bifurcated) arms** with pinnately arranged **pinnules**
- Spines, madreporite and Pedicellariae in Crinoidea - **Absent**
- Larva of crinoids - **Doliolaria**
- The second larval stage of feather star - **Pentacrinoid** which is stalked and sessile.

- Viscera is enclosed in a calcareous test called - **Theca**
- The aboral cup of theca is - **Calyx**
- The oral cover of theca is - **Tegmen**
- Condition of arms is - **Biramous**
- Tube feet - **with out suckers**

Eg:

Scientific Name	*Common Name*
Ptilocrinus	**Sea lilly with cirri**
Bathy crinus	**Sealilly without cirri**
Antedon	**Feather Star**
Neometra	**Feather Star**

SBPHYLUM :: ELEUTHEROZOA

- Oral surface is directed towards the **substratum**
- Anus, if present, is on **aboral surface**.
- Madreporite is **present.**
- Ambulacral grooves are **closed,** except in **Asteroidea**
- The subphylum which includes free moving stalkless Echinoderms - **Eleutherozoa**

CLASS : ASTEROIDEA

- 'Sea Stars' (or) 'Star Fishes' belong to the class - **Asteroidea**
- Arms in sea stars - **Five blunt arms radiate from a central disc**
- Ambulacral grooves sea star - **Open extend up to the end of arms**
- Location of Madreporite and anus - **Aboral surface**
- Location of mouth - **Oral surface**
- Tube feet in star fishes - **Well developed with suckers**
- Tube feet with out suckers in - **Astropecten**
- Respiratory organs - **Papulae or dermal branchiae**
- Pedicellariae possess - **Two jaws**
- 'Autotomy' of arms is - **Common**
- Larvae of star fishes - **Bipinnaria, Brachiolaria**

Eg : Asterias, Pentaceros, Palmipes

CLASS : OPHIUROIDEA

- Basket stars or Brittle stars (or) serpent stars belong to the class - **Ophiuroidea**
- Arms in Brittle stars - **Five long slender arms radiate from a distinct central disc**
- The animals which move by serpentine lashing arms - **Ophiuroidea**
- Arms branched in - **Gorgonocephalus**
- Anus in Brittle stars is - **Absent**
- Ambulacral grooves in brittle stars - **Closed**
- Tube feet - **Sucker less**
- Respiratory organs - **Genital bursae**
- Location of mouth and Madreporite - **Oral surface**
- Pedicellariae in Brittle stars are - **Absent**
- 'Autotomy' of arms - **common**
- larva of Brittle star - **Ophioplueteus**

Eg :

Ophiothrix - Spiny brittle star

Gorgonocephalus (Basket star)

CLASS : ECHINOIDEA

- Members of class Echinoidea are commonly know as - **Sea urchins**
- Body shape in sea urchins - **Globular, spherical (or) Heart shaped (or) Disc shaped**
- Skeleton enclosing the body of sea urchin - **Test (or) Corona**
- Spines in sea urchins - **Sharp movable spines in rows**
- Pedicellariae in sea urchins - **Three jawed**
- Location of anus and madreporite - **Aboral surface**
- Respiratory organs - **Peristomial gills**
- Ambulacral grooves in Sea urchins - **Ambulacral grooves closed**
- The masticatory structure present in Echinoidea - **Aristotle's lantern**
- Arms in sea urchins - **Absent**
- Tube feet in sea urchins - **Absent**
- Characteristic larva of sea urchins- **Echinopluteus**

Eg : from Echinoidea

Common Name	**Generic Name**
Heart urchin	***Echinocardium***
Cake urchin, Sea bicuit	***Clypeaster***
Sand dollar (or) Sea disc	***Echinodiscus***

CLASS : HOLOTHUROIDEA

- Sea cucumbers belong to the class- **Holothuroidea**
- Burrowing echinoderms - **Sea cucumbers**
- Arms spines and pedicellariae in sea cucumbers- **Absent**
- Body shape - **Cylindrical with mouth and cloaca at opposite ends**
- Cloaca of sea cucumber is surrounded by- **Respiratory trees**
- Ambulacral grooves in sea cucumbers - **closed**
- Leathery skin in sea cucumbers contains - **Calcareous spicules**
- Madreporite in sea cucumbers - **Internal**
- Tentacles surrounding the mouth are modi-

fied from - **Tube feet**

- Characteristic larva of sea ccumber - **Auricularia**
  Eg : Cucumaria
  Synapta (largest and estuarine)
- Thyone
- Echinoidea and Holothuroidea are placed under the taxon - **Echinozoa**

Echinodermata

GENERAL CHARACTERS

LEVEL-I

444. The pincer-like structures which keep the body clean, located on the body surface of Echinoderms
1) Trichocyst 2) Nematocyst
3) Pedicellaria 4) Tiedmann's bodies

445. Coelom in Echinodermata is
1) Pseudocoel 2) Haemocoel
3) Schizocoel 4) Enterocoel

446. Structures which perform locomotion, respiration, excretion and food capturing in Echinoderms
1) Setae 2) Tube feet
3) Pedicillariae 4) Tentacles

447. Calcareous ossicles are present in the
1) Echinodermates 2) Sponges
3) Arthropods 4) Molluscs

448. Water vascular system is derived from
1) Tube feet 2) Coelom
3) Ecto and endoderms 4) Body wall

449. 'Tube feet' is the part of which system in Echinoderms
1) Canal system 2) Circulatory system
3) Water vascular system 4) Excretory system

450. The Haemal system or Blood vascular system of echinoderms is of
1) Closed type heart and blood vessels
2) Open type with heart and without blood vessels
3) Open type without heart and blood vessels
4) Closed type without heart and blood vessels

451. The echinoderms resemble chordates in
1) The development of coelom
2) Indeterminate type of clevage
3) Deuterostomous nature
4) All the above

452. Deuterostomous enterocoelomata invertabrate phylum
1) Annelida 2) Arthropoda
3) Mollusca 4) Echinodermata

453. The animal phylum with pentaradial symmetry in adults is
1) Annelida 2) Arthropoda
3) Mollusca 4) Echinodermata

454. The type of symmetry in echinoderm larvae is
1) Radial symmetry 2) Biradial symmetry
3) Bilateral symmetry 4)Pentaradial symmetry

455. The eumetazoan phyla with nervous system but without brain.
1) Annelida, Echinodermata
2) Mollusca, Echinodermata
3) Coelenterata, Echinodermata
4) Annelida, Arthropoda

456. Trploblastic animal phylum without brain
1) Platyhelminthes 2) Coelenterata
3) Annelida 4) Echinodermata

457. The bilateria member that exhibits pentaradial symmetry is **(EAM-2008)**
1) Neomenia 2) Nautilus
3) Neometra 4) Neopilina

458. The animal as an adult secondarily acquires pentaradial symmetry when its bilaterally symmetrical larva metamorphoses, is :
1) Polygordius 2) Gorgonia
3) Gorgonocephalus 4) Pila

LEVEL-II

459. Identify the correct answer from the choice given below:
Assertion (A): Echinoderms are the only triploblastic animal with primitive nervous system
Reason (R): In Echinoderms bilaterally symmetrical larva gets transformed into pentaradially symmetrical adult.
1) Both A and R are true and R is the correct explanation to A
2) Both A and R true and R is not the correct explanation to A
3) A is true R is false
4) Both A and R are false

460. Read the following statements about Echinodermata and Identify the correct statement
I. The coelome is an entrocoelom
II. They are deuterostomian invertebrates
III.Clevage is spiral and indeterminate
1) I, II 2) II, III
3) I, II ,III 4) I, III

461. Read the following statements about the water vascular system of Echinoderms
I. It is derived from coelom
II. It shows ambulacral canals with tube feet

III. It helps in cleaning the body
1) I, II, III 2) I, III
3) I, II 4) II, III

CLASS : CRINOIDEA

LEVEL-I

462. Which of the following is true about sea-lilies
1) Oral surface bears both mouth and anus
2) Five-biramous arms with pinnules are present
3) Spines, Madriporite and pedicillariae are absent
4) All of the above

463. Feather stars are included under the class
1) crinoidea 2) Asteroidea
3) Holothuroidea 4) Ophiuroidea

464. Pentacrinoid larva is seen in the life histroy of
1) Astropecten 2) Ophiothrix
3) Cucumaria 4) Neometra

LEVEL-II

465. Match the following and choose the correct combination

List - I	List - II
A. Neometra	i) Heart Urchin
B. Ptilo crinus	ii) Basket star
C. Bathy crinus	iii) Feather star
D. Gorgono cephalus	iv) Sea lilly without cirri
	v) Sea lilly with cirri

	A	B	C	D
1.	III	V	VI	I
2.	I	III	IV	II
3.	III	V	VI	II
4.	III	V	IV	II

466. Read the following statements about sea lilies and Identify the correct statements
I. They are free swimming crinoid's
II. Spines and pedicillariae are absent
III. Development includes Doliolaria larva
1) II, III 2) I, II 3) I, III 4) I, II, III

CLASS : ASTEROIDEA

LEVEL-I

467. Larval forms of star fishes are
1) Bipinnaria and Auricularia
2) Auricularia and Brachiolaria
3) Bipinnaria and Brachiolaria
4) Ophiopleuteus and Doliolaria

468. In which class of Echinodermata pedicillariae with two jaws are present
1) Echinoidea 2) Asteroidea
3) Ophiuroidea 4) Crinoidea

469. Madreporite in Asterias is
1) Internal 2) oral
3) Aboral 4) Absent

LEVEL-II

470. The following are the statements about star fishes
I) All are marine
II) Blastopore develops into anus
III) Sexual dimorphism is seen
The Correct combination is
1) I,II,III are true
2) Only I and II are true
3) Only I and III are true
4) Only II and III are true

471. The following are the statements about star fishes
I) two jawed predicellaria are present
II) tube feet are with suckers
III) Madreporite is on oral surface
The correct answer is
1) I,II,III are true
2) Only I and II are true
3) Only I and III are true
4) Only II and III true

CLASS : OPHIUROIDEA

LEVEL-I

472. Gorgonocephalus is commonly known as
1) Basket star 2) Heart urchin
3) Cake urchin 4) Spiny brittle star

473. Echinoderms without anus
1) Asteroidea 2) Ophiuroidea
3) Holothuroidea 4) Crinoidea

474. Respiration in ophiothrix is by
1) Papulae 2) Genital bursae
3) Peristomial gills 4) Respiratory trees

475. Echinoderm with in which madreporite is oral in position
1) *Asterias* 2) *Ptilocrinus*
3) *Ophiothrix* 4) *Cucumaria*

LEVEL-II

476. Read the following statements about basket star
I. They belong to the class ophuiroidea
II. Pedicillaria are two jawed
III. Madreporite is aboral in position
Identify the correct statement(s)
1) only I 2) I and II
3) only II 4) I, III

CLASS : ECHINOIDEA

LEVEL-I

477. Echinocardium belongs to the class
1) Echinodermata 2) Echinodera
3) Echinoidea 4) Edentata

478. "Aristotles's lantern" is seen in
1) *Cucumaria* 2) *Echinus*
3) *Synapta* 4) *Echinocardium*

479. Skeleton of which echinoderms is called 'test' or corona ?
1) Holothurians 2) Echinoids
3) Crinoids 4) Asteroids

LEVEL-II

480. Match the following

Scientific name	**Common name**
A. *Echino cardium*	I. Heart urchin
B. *Echinodiscus*	II. Sea bisciut
C. *Clypeaster*	III. Sand dollar
D. *Echinus*	IV.Sea urchin

	A	**B**	**C**	**D**
1.	II	I	IV	III
2.	I	IV	II	III
3.	I	III	II	IV
4.	II	I	III	IV

481. Read the following statements about Echinoids
I. Madreporite is aboral in position
II. Tube feet are with suckers
III. Pedicillariae are three jawed
Identify the correct statements
1) I, II, III 2) I, II
3) II, III 4) I, III

CLASS : HOLOTHUROIDEA

LEVEL-I

482. Burrowing Echinoderms with cylindrical bodies are
1) Sea Urchins 2) Sea-cucumbers
3) Sea-lilies 4) Sea stars

483. Mouth surrounded by contractile tentacles is present in
1) *Holothuria* 2) *Echinus*
3) *Asterias* 4) *Ophiura*

484. Madreporite is internal in
1) Ophiuroidea 2) Echinoidea
3) Holothuroidea 4) Asteroidea

485. Which is a seacucumber
1) *Holothuria* 2) *Solaster*
3) *Spatangus* 4) *Pelagothuria*

486. Cloacal respiratory trees are found in
1) *Pentaceros* 2) *Ophiothrix*
3) *Ophiura* 4) *Synapta*

487. Madreporite is internal in
1) Starfish 2) Brittle star
3) Sea cucumber 4) Sea urchin

LEVEL-II

488. Read the following statements about cucumaria and Identify the correct statements
I. Skin is soft and leathary (coriaceous)
II. Mouth is surrounded by tentacles modified from tube feet
III. Tube feet are with suckers
1) I, II & III 2) I & III
3) II & III 4) Only I

LEVEL - III

2.1. PROTOZOA LINKING TYPE QUESTIONS

489. Study the following and select the correct combinations

Protozoan	**Character – I**	**Character – II**	
A) Radiolarians	Spherical symmetry	Siliceous shells	
B) Foraminiferans	Asymmetry	Calcarious shells	
C) Choanoflagellates	radial symmetry	Strontium shulphate shell	
D) Heliozoans	Spherical symmetry	Porous calcarious shell	
1) A and B	2) B and C	3) C and D	4) A and D

490. Study the following and select the correct combinations

Protozoan	**Asexual Reproduction**	**Sexual reproduction**	
A) Paramecium	transverse binary fission	conjugation	
B) Haplosporidium	multiple fission	endomyxis	
C) Plasmodium	schizogony	anisogamy	
D) Opalina	plasmotomy	syngamy	
1) All	2) All except A	3) All except B	4) All except D

491. Study the following and select the correct combination

Protozoan	**Character - I**	**Character - II**	
A) *Physarum*	acellular slime mould	plasmodium stage	
B) *Actinosphaerium*	ray footed protozoan	siliceous shell	
C) *Dictyostelium*	cellular slime mould	pseudoplasmodium stage	
D) *Plasmodium*	parasitic protozoan	apicomplex	
1) All	2) All except A	3) All except B	4) All except D

492. Study the following and select the correct combinations

Class	**Character**	**Example**	
A) Telosporea	Sporozoites are long	*Plasmodium*	
B) Toxoplasmea	Two layered pellicle	*Mycoplasma*	
C) Haplosporea	Amoeboid spores	*Haplosporidium*	
D) Myxosporidea	Intra sporal filament	*Babesia*	
1) A and B	2) B and C	3) A and C	4) B and D

2.2 LINK TYPE QUESTIONS

493. Study the following and select the correct combinations

Sponge	**Character – I**	**Character – II**	
A) Spongilla	lives in fresh water	spongin fibres	
B) Hyalonema	marine sponge	6 rayed silicious spicules	
C) Euplectella	lives in deep sea	solitory sponge	
D) Scypha	lives in shallow water	calcarious spicules	
1) All	2) All except ii	3) All except i	4) All except iv

494. Study the following and select the correct combinations

Class	**Character**	**Example**	
A) Calcaria	Calcarious spicules	*Leucosolenia*	
B) Hexactinellida	Siliceous spicules	*Chalina*	
C) Demospongia	Spongin fibres	*Spongilla*	
D) Calcispongiae	Siliceous spicules	*Euplectella*	
1) A and B	2) B and C	3) A and C	4) C and D

2.3.LINK TYPE QUESTIONS

495. Study the following and select the correct combinations

Class	**Character**	**Example**
A) Hydrozoa	Polymorphism	*Physalia*
B) Actinozoa	Siphonoglyphs	*Adamsia*
C) Scyphozoa	Gastric filaments	*Aurelia*

D) Anthozoa Mesenteries *Gorgonia*

1) All 2) All except D 3) All except C 4) All except A

496. Study the following and select the correct combinations

Animal	**Character – I**	**Character – II**
A) Obelia	Metagenesis	Colonial Form
B) Rhizostoma	Oral arms	Solitary forms
C) Gorgonia	Stomodaeum	Colomial form
D) Corallium	Exoskeleton	Marine form

1) All except D 2) All except A and C 3) All 4) B and C only

497. Study the following and select the correct combinations

Animal	**Gonads**	**Gastrovascular Cavity**
A) *Hydra*	Ectodermal	Simple
B) *Obelia*	Endodermal	Divided into radial & ring canals
C) *Adamsia*	Endodermal	Divided into radiating compartments
D) *Aurelia*	Ectodermal	Gastric pouches

1) A and B 2) B and C 3) A and C 4) B and D

498. Study the following:

i) Halistemma Non-cellular moseglea, Hydrozoa
cnidoblasts in ectoderm

ii) Rhizostoma Non-cellular mesoglea, Anthozoa
cridoblasts in only
endoderm

iii) Rhizostoma Mesoglea with amoeboid Scyphozoa
cells, cnidoblasts are in
both ectoderm & endoderm

The correct combination is

1) I & II are correct 2) I & III are correct

3) II & III are correct 4) I, II & III are correct

LINK TYPE QUESTIONS

499. Study the following:

Name of flat worm	**Character**	**Habitat**
I) *Convoluta*	Unsegmented body, without Suckers, hooks	Free living
II) *Fasciola*	Tough body covering without Suckers, hooks	Free living
III) *Dugesia*	Syncitial tegument, with Suckers, hooks	Parasitic
IV) *Dugesia*	Segmented body with hooks	Parasitic

Correct combination is

1) I & II are correct 2) I & IV are correct

3) I is correct 4) All are correct

500. Study the following and select the correct combination.

Animal	**Character-I**	**Character-II**
A) *Dugesia*	Eversible stomach forms proboscis	Muller's larva in the development
B) Fasciola	Bifurcated intestine	Miracidium larva
C) Taenia	No gastrovascular cavity	Hooked hexacanths larva
D) Convoluta	Extensively branched gastrovascular cavity	Mouth is present, anus is absent

1) A, B and D 2) B, C and D

3) A, C and D 4) A, B and D

ANNELIDA - LEVEL-III

501. Match the following and choose the correct combination

List-I	**List-II**
A. Nereis	I. Oligochaeta
B. Hirudo	II. Clitellata
C. Girdle worms	III. Hirudinea
D. Tubifex	IV. Polychaeta
	V. Errantia

	A	**B**	**C**	**D**
1.	I	II	III	IV
2.	II	IV	V	III
3.	IV	III	II	I
4.	V	IV	III	II

503. Study the following

Class	Character	Example:
I. Polychaeta	Many setae are present	Nereis
II. Oligochaeta	Parapodia are present	Aphrodite
III. Hirudinea	Botryoidal tissue is present	Haemadipsa
IV. Archiannelida	Clitellum is present	Polygordius

Which of the above are correct
1) All are correct
2) I and II correct
3) II and III correct
4) I and III correct

504. Macth the following

Animal	Locomotory character
A. Lumbricus	I. Fresh water oligochaete with few setae
B. Pontobdella	II. Parapodia and many setae
C. Chaetopterus	III. Clitellum forms cocoon
D. Tubifex	IV. suckers
	V. Ciliated epidermis

	A	B	C	D
1)	IV	III	II	I
2)	III	IV	II	I
3)	III	II	IV	V
4)	IV	II	III	I

505. Identify the annelids with clitellum
a) Pheritima b) Eunice
c) Hirudo d) Chaetopterus
1) abcd 2) acd 3) ac 4) bd

506. Match the following

List-I	List-II
A. Unisexual annelid with parapodia	I. Arenicola
B. Fresh water annelid with few setae	II. Hirudinaia
C. Bisexual annelid with copulatory organ	III. Megascolex
D. Bisexual annelid with out copulatory organ	IV. Tubifex

	A	B	C	D
1.	I	II	III	IV
2.	I	III	II	IV
3.	I	IV	II	III
4.	IV	I	II	III

ARTHROPODA - LEVEL-III

507. Match the following and choose the correct combination

List-I	List-II
a) Pediculus	I) Dog tapeworm
b) Lepisma	ii) Devil fish
c) Aphrodite	iii) Head louse
d) Cimex	iv) Sea mouse
	v) Bed bug
	vi) Silver fish

	A	B	C	D
1.	IV	I	II	III
2.	III	IV	V	VI
3.	VI	V	IV	III
4.	III	VI	IV	V

508. Study the following

Class	Appendages	Excretory Organs
i) Crustacea	Two pairs of antenna	Antennary glands
ii) Arachnida	Two pairs of Chelicerae	Green glands
iii) Chilopoda	Two pairs of maxillae	Coxal glands
iv) Hexapoda	Two pairs of wings	Malpighian tubules

Find out the correct pair answers
1) I & iv correct 2) I, iii correct
3) ii, iv correct 4) iv, iii correct

509. Match the following choose the correct combination

List-I	List-II
A. Lepsima	I. Mite
B. Sarcoptes	II. Root headed barnacle
C. Spirobolus	III. Millipede
D. Balanus	IV. Rock barnacle
	V. Silver fish

The Correct match is

	A	B	C	D
1.	V	I	III	IV
2.	V	II	III	IV
3.	I	II	III	IV
4.	II	I	IV	III

510. Match the following and choose the correct combination

List-I	List-II
A. Julus	I. Crustacea
B. Triarthrus	II. Diplopoda
C. Balanus	III. Insecta
D. Lepisma	IV. Arachnida
	V. Trilobita

The Correct match is

	A	B	C	D
1.	IV	II	V	III
2.	IV	V	I	III
3.	II	V	IV	III
4.	II	V	I	III

511. Study the following

Class	Character	Example:
I. Polychaeta	Locomotory structures are parapodia with many setae	Paddle worm
II. Oligochaeta	Clitellum which produces cocoon is present	Pontobdella
III. Hirudinea	Definite number of segments are present	Hirudo

Which of the above are correct

1) I and II 2) II and III
3) I and III 4) I, II and III

512. Match the following and choose the correct combination

List-I	List-II
A. Root headed barnacle	I. Scolopendra
B. Centipede	II. Limulus
C. House fly	III. Sacculina
D. Horse shoe crab	IV. Julus
	V. Musca

The Correct match is

	A	B	C	D
1.	III	I	IV	II
2.	III	I	V	II
3.	IV	I	V	II
4.	II	I	V	III

513. Match the following and choose the correct combination

List-I	List-II
A. Aranea	I. Crustacea
B. Pediculus	II. Arachnida
C. Sacculina	III. Diplopoda
D. Dalmanites	IV. Insecta
	V. Trilobita

The Correct match is

	A	B	C	D
1.	II	IV	I	V
2.	II	IV	V	I
3.	III	IV	I	V
4.	III	II	I	V

514. Study the following

Class	Character	Example
I) Diplopoda	Respiration by trachea	Spirobolus
II) Crustacea	Excretion by green glands	Musca
III) Insecta	4 pairs of legs	Periplanata
IV) Arachnida	Excretion by Malpighian tubules	Sarcoptes

Which of the above two are correct

1) I and IV 2) I and IV
3) II and III 4) I and III

515. Study the following

Class	Respiratory Organs	Example
I)Xiphosura	Book gills	King crab
II) Insecta	Gills	Silver fish
III) Arachnida	Book lungs	Scorpion
IV) Crustacea	Green glands	Scutigera

Which of the above two are correct

1) I and II 2) II and III
3) III and IV 4) I and III

516. Study the following

Class	Excretory Organs	Example
I) Crustacea	Green glands	Palaemon
II) Chilopoda	Coxal glands	Julus
III) Insecta	Malpighian tubules	Periplaneta
IV) Diplopoda	Malpighian tubules	Scolopendra

Which of the above two are correct

1) I and III 2) I and II
3) II and IV 4) I and IV

517. Lepas, Limulus, Lepisma and Scolopendra have jointed appendages. Which of the below given set of organisms ae aquatic and respire through gills : **(EAM-2006)**

1) Lepas and Lepisma
2) Lepas and Limulus
3) Limlus and Scolopendra
4) Scolopendra and Lepas

MOLLUSCA - LEVEL-III

518. Match the following and choose the correct combination

List-I	List-II
A. Cone like foot	I. Pelecypoda
B. Wedge shaped foot	II. Aplacophora
C. Arms with suckers	III. Scaphopoda
D. Groove like foot	IV. Gastropoda
	V. Cephalopoda

The Correct match is

	A	B	C	D	
1.	III	I	V	II	
2.	II	I	III	IV	

3.	I	II	III	IV
4.	II	III	IV	V

519. Match the following and choose the correct combination

List-I	List-II
A. 6-88 pairs of ctenidia	I. Gastropoda
B. 5-6 pairs of ctenedia	II. Cephalopoda
C. Pulmonary sac	III. Polyplacophora
D. 1 or 2 pairs of ctenidia	IV.Monoplacophora
	V. Scaphopoda

The Correct match is

	A	**B**	**C**	**D**
1.	I	II	III	IV
2.	III	II	I	IV
3.	III	IV	I	II
4.	II	III	IV	I

520. Match the following and choose the correct combination

List-I	List-II
A. Shell with eight plates	I. Octopus
B. Univalve shell	II. Dentalium
C. Tubular shell	III. Neopilina
D. Shell absent	IV. Chiton
	V. Unio

The Correct match is

	A	**B**	**C**	**D**
1.	I	III	IV	II
2.	IV	III	II	I
3.	IV	I	II	III
4.	III	II	I	IV

521. Match the following and choose the correct combination

List-I	List-II
A. Captacula	I. Chiton
B. Bivalve shell	II. Sepia
C. Internal shell	III. Mytilus
D. Flat foot	IV. Denalium

The Correct match is

	A	**B**	**C**	**D**
1.	I	III	IV	II
2.	IV	III	II	I
3.	IV	I	II	III
4.	III	II	I	IV

522. Match the following and choose the correct combination

List-I	List-II
A. Internal segmentation	I. Aplacophora
B. Flat foot	II. Pelecypoda
C. Cuticle with Calcareous spicules	III. Monoplacophora
D. Laterally compressed body	IV. Polyplacophora

The Correct match is

	A	**B**	**C**	**D**
1.	III	IV	I	II
2.	I	II	III	IV
3.	IV	III	II	I
4.	II	III	IV	I

523. Study the following and choose the correct combination

Animal	**Charcter**	**Class**
I) Cuttle fish	Arms with suckers	Cephalopoda
II) Elephant tusk shells	Captacula	Scaphopoda
III) Apple snail	Grooved foot	Gastropoda
IV) Pearl oyster	Radula	Pelecypoda

Which of the above are true

1) Both I and II 2) II and III
3) III and IV 4) I and IV

524. Study the following:

Animal	**Character**	**Class**
1) Unio	Wedge shaped foot	Pelecypoda
II) Chiton	Flat foot	Polyplacophora
III) Dentalium	Cone like foot	Monoplacophora
IV) Neomenia	Grrove like foot	Scaphopoda

Which of the above are correct

1) I and II 2) II and III
3) III and IV 4) I and IV

ECHINODERAMATA -LEVEL-III

525. Match the following and choose the correct combination

Animal	**Larva**
a) Antedon	I) Absent
b) Mytilus	ii) Lovens larva
c) Julus	iii) Planula
d) Polygordius	iv) Veliger
	v) Doliolaria

	A	**B**	**C**	**D**
1.	V	IV	I	II
2.	II	I	II	IV
3.	V	IV	III	II
4.	II	I	V	III

526.

List-I	**List-II**
A. Brittle star	I. Crinoidea
B. Feather star	II. Holothuroidea
C. Sea cucumber	I I I .
Ophiuriodea	
D. Cake Urchin	IV. Echinoidea

The Correct match is

	A	B	C	D
1.	I	II	III	IV
2.	II	III	I	IV
3.	III	I	II	IV
4.	I	III	II	IV

527. Match the following and choose the correct combination

List-I	List-II
A. Pedicellariae	I. Locomotion
B. Dermal Branchiae	II. Pouches of arch enteron
C. Tubefeet	III. Respiration
D. Enterocoelom	IV. Cleaning
	V. Digestion

The Correct match is

	A	B	C	D
1.	I	II	V	IV
2.	IV	III	I	II
3.	II	III	IV	V
4.	III	V	IV	II

528. Match the following and choose the correct combination

List-I	List-II
A. Echinus	I. Auricularia
B. Ophiothrix	II. Brachiolaria
C. Cucumeria	III. Doliolaria
D. Asterias	IV. Ophiopluteus
	V. Echinopluteus

The Correct match is

	A	B	C	D
1.	V	IV	I	II
2.	II	I	V	IV
3.	II	III	V	IV
4.	III	II	IV	I

529.

Animal	Character	Class
I) Sea cucumber	Respiratory trees	Asteroidea
II) Sea urchin	Aristotle's lantern	Echinoidea
III) Sea lilly	Biramous arms	Crinoidea
IV) Sea star	Movable spines	Holothuroidea

Which of the above two are correct

1) I and II 2) I and III
3) II and III 4) II and IV

530. Study the folowing

Animal	Character	Function
I) Star fish	Tubefeet	Locomotion
II) Basket Star	Long arms	Respiration
III) Feather star	Madreporite	Water entry
IV) Heart urchin	Pedicellaria	Cleaning

Which of the above two are correct

1) I and II 2) I and IV
3) II and III 4) III and IV

531. Study the following

Animal	Water Vascular system	Special features
i) Cucumaria	Tube foot with sucker	Respiratory tree
ii) Clypeaster	Closed ambulacral groove	Aristotle's lantern absent
iii) Neometra	Open ambulacral groove	Presence of pinnules
iv) Gorgonocephalus	Tube foot with suckers	Absence of anus

Which of two are incorrect

i) i, ii 2) ii, iii 3) iii, iv 4) iv, ii

532. Match the following and choose the correct combination

List-I	List-II
a) Gorgonocephalus	i. Doliolaria
b) Synapta	ii. Auricularia
c) Salmacis	iii. Ophiopluteus
d) Antedon	iv. Planula
	v. Echinopluteus

	A	B	C	D
1.	V	IV	II	III
2.	III	II	V	I
3.	I	II	III	IV
4.	IV	V	III	II

UNIT-II

KEY (Level - I & II))

PROTOZOA

1) 3 2) 2 3) 1 4) 3 5) 2 6) 4 7) 3
8) 3 9) 2 10) 2 11) 2 12) 3 13) 2 14) 4
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22) 3 23) 2 24) 1 25) 1 26) 1 27) 2 28) 4
29) 1 30) 3 31) 3 32) 1 33) 4 34) 3 35) 2
36) 4 37) 2 38) 3 39) 2 40) 3 41) 3 42) 4
43) 4 44) 2 45) 4 46) 3 47) 2 48) 1 49) 1
50) 1 51) 1 52) 3

PHYLUM:PORIFERA

53) 1 54) 1 55) 4 56) 2 57) 3 58) 3 59) 2
60) 1 61) 1 62) 2 63) 3 64) 2 65) 1 66) 3
67) 3 68) 1 69) 1 70) 4 71) 2 72) 4 73) 1
74) 3 75) 2 76) 3 77) 2 78) 2 79) 4 80) 4
81) 2 82) 4 83) 3 84) 2 85) 1 86) 3 87) 2
88) 3 89) 1 90) 2 91) 2 92) 3 93) 2 94) 4
95)1 96)3 97) 2 98) 4 99)3 100)1 101)1
102)3 103)4 104)1 105)3 106)4 107)1 108)4

PHYLUM: CNIDARIA

109) 2 110) 1 111) 1 112) 4 113) 3 114) 1 115) 4
116) 1 117) 1 118) 3 119) 2 120) 3 121) 4 122) 1
123) 2 124) 3 125) 1 126) 2 127) 3 128) 2 129) 3
130) 1 131) 2 132) 1 133) 2 134) 3 135) 4 136) 3
137) 2 138) 2 139) 4 140) 3 141) 3 142) 3 143) 1
144) 4 145) 2 146) 1 147) 3 148) 2 149) 2 150) 1
151) 1 152) 1 153) 1 154) 1 155) 3 156) 4 157) 3
158) 2 159) 1 160) 1 161) 1 162) 2 163) 3 164) 1
165) 1 166) 1 167) 1

PHYLUM-PLATY HELMINTHES

168) 2 169) 3 170) 3 171) 2 172) 3 173) 1 174) 2
175) 1 176) 2 177) 1 178) 2 179) 2 180) 3 181) 1
182) 4 183) 1 184) 1 185) 1 186) 2 187) 2 188) 3
189) 3 190) 1 191) 3 192) 4 193) 4 194) 2 195) 1
196) 2 197) 1 198) 3 199) 4 200) 4 201) 2 202) 2
203) 4 204) 3 205) 3 206) 3 207) 3 208) 3 209) 4
210) 3 211) 4 212) 4 213) 3 214) 1 215) 4 216) 4
217) 2 218) 1 219) 1 220) 2 221) 1 222) 3 223) 1

PHYLUM : NEMATODA

224) 2 225) 1 226) 2 227) 2 228) 1 229) 1 230) 2
231) 1 232) 3 233) 4 234) 3 235) 1 236) 2 237) 2
238) 4 239) 3 240) 4 241) 4 242) 2 243) 3 244) 2
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252) 3 253) 1 254) 2 255) 3 256) 1 257) 1 258) 3
259) 2

ANNELIDA GENERAL CHARACTERS

260)3 261)3 262)2 263)3 264)3 265) 2 266) 1
267) 4 268) 4 269) 2 270) 3 271) 3 272) 1 273) 2
274) 3 275) 3 276) 2 277) 2 278) 2 279) 1 280) 1
281) 1 282) 4 283) 1 284) 4

POLYCHAETA

285) 3 286) 2 287) 2 288) 3 289) 3 290) 4 291) 4
292) 3 293) 1 294) 1 295) 3 296) 2 297) 3 298) 2
299) 1

OLIGOCHAETA

300) 2 301) 1 302) 1 303) 2 304) 4

HIRUDINEA

305) 1 306) 4 307) 2 308) 4 309) 1 310) 2 311)
1 312) 3

PHYLUM - ARTHROPODA

GENERAL CHARACTERS

313)1 314) 2 315) 2 316) 1 317) 2 318) 1 319) 4
320) 1 321) 2 322)2 323) 1 324) 4

SUB-PHYLUM-I :: TRILOBITA

325) 4 326) 2 327) 1 328) 1 329) 1 330) 2 331)3

CLASS-I XIPHOSURA

332) 2 333) 3 334) 1 335) 1 336) 2 337) 2 338) 1

CLASS - II :: ARACHNIDA

339) 2 340) 3 341) 2 342) 2 343) 1 344) 3 345) 1
346) 2 347) 2 348) 2 349) 3

CLASS - I :: CRUSTACEA

350) 1 351) 4 352) 4 353) 4 354) 3 355) 2 356) 2
357) 4 358) 2 359) 1 360) 2

CLASS - II CHILOPODA or TRIGNATHA

361) 2 362) 1 363) 3 364) 1 365) 1 366) 3 367) 1

CLASS - III :: DIPLOPODA or DIGNATHA

368) 3 369) 3 370) 1 371) 1 372) 3 373) 1 374) 3

CLASS - IV :: INSECTA or HEXAPODA

375) 3 376) 1 377) 2 378) 4 379) 1

MOLLUSCA GENERAL CHARACTERS:

380) 1 381) 2 382) 4 383) 2 384) 1 385) 3 386) 3 387) 2 388) 2 389) 1 390) 4 391) 2 392) 1 393) 2 394) 1

CLASS :: APLACOPHORA

395) 1 396) 1 397) 3 398) 2 399) 2

CLASS :: POLYPLACOPHORA

400) 1 401) 1 402) 1 403) 3 404) 2 405) 2

CLASS :: MONOPLACOPHORA

406) 3 407) 1 408) 3 409) 3 410) 1 411) 1 412) 2

GASTROPODA

413) 4 414) 1 415) 2 416) 1 417) 3 418) 1 419) 2

CLASS :: SCAPHOPODA

420) 4 421) 2 422) 1 423) 3

CLASS :: PELECYPODA or BIVALVIA or LAMELLIBRANCHIATA

424) 4 425) 4 426) 3 427) 3 428) 1 429) 2 430) 2 431) 3 432) 4

CLASS :: CEPHALOPODA (or) Siphonopoda

433) 3 434) 3 435) 4 436) 3 437) 2 438) 3 439) 2 440) 4 441) 3 442) 1 443) 2

PHYLUM :: ECHINODERAMATA

GENERAL CHARACTERS

444) 3 445) 4 446) 2 447) 1 448) 2 449) 3 450) 3 451) 4 452) 4 453) 4 454) 3 455) 3 456) 4 457) 3 458) 3 459) 2 460) 1 461) 3

CLASS : CRINOIDEA

462) 4 463) 1 464) 4 465) 4 466) 1

CLASS : ASTEROIDEA

467) 3 468) 2 469) 3 470) 2 471) 2

CLASS : OPHIUROIDEA

472) 1 473) 2 474) 2 475) 3 476) 1

CLASS : ECHINOIDEA

477) 3 478) 4 479) 2 480) 3 481) 1

CLASS : HOLOTHUROIDEA

482) 2 483) 1 484) 3 485) 1 486) 4 487) 3 488) 1

LEVEL - III

489) 1 490) 3 491) 1 492) 3 493) 1 494) 3 495) 1 496) 1 497) 3 498) 3 499) 2 500)3 501)2 502)3 503) 4 504) 2 505) 3 506) 3 507) 4 508) 1 509)1 510) 4 511) 3 512) 2 513) 1 514) 1 515) 4 516)1 517) 2 518) 1 519) 3 520) 2 521) 2 522) 1 523) 1 524) 1 525) 1 526) 3 527) 2 528) 1 529) 3 530) 2 531) 4532) 2