To study classification with reasons up to class of the following with two examples of each (D) A) Arthopoda

a) Sub-phylum - Chelicerata 1) Class - Arachnida i) Scorpion (Buthus sp) ii) **Spider** (Achaearanea sp)

b) Sub-phylum - Mandibulata 1) Class - Crustacea i) **Water Flea** ( Daphnia sp) ii) Cyclop 2) Class - Myriapoda i) **Milliped (Julus sp)** ii) Centipede (Scolopendra sp) 3) Class - Insecta i) **Locust (Schistocerca sp)** ii) Dragonfly

c) Sub-phylum – Onychophora – Peripatus

**Study and classification with reasons of the following animals:**

**Scorpion, Cyclop, Centipede , Dragonfly, Peripatus**

**Phylum - Arthropoda**

**Sub-phylum**

**Chelicerata Mandibulata Onychophora**

e.g. Peripatus

**Class Classes**

**Arachnida**

e.g. Scorpion  **Crustacea Myriapoda** **Insecta**

e.g. Cyclop e.g. Centipede e.g. Dragonfly

1. **Scorpion *Palamnaeus spp***

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| **Kingdom:** Animalia | **1.** Nutrition heterotrophic. 2. Control and Coordination mechanisms well developed. |
| **Subkingdom:** Metazoa | Multicellular animals. |
| **Division:** Bilateria | Triploblastic animals with bilateral symmetry. |
| **Subdivision :** Coelomata | Presence of true coelom. |
| **Phylum:** Arthropoda | **1.** Body with jointed appendages. **2.** Compound eyes, open circulatory system and cuticular exoskeleton. **3.** Respiration by gills, book lungs or trachea. **4.** Excretion by Malpighian tubules, green glands or coxal glands. 5.Unisexual animals. |
| **Sub-phylum:** Chelicerata | **1.** Body divisible into cephalothorax and abdomen.**2.** Cephalothorax with six pairs of appendages.**3**. Antennae and true jaw absent. |
| **Class:** Arachnida | **1.** Air breathing terrestrial arthropods. **2.** Cephalothorax has a pair of sessile simple eyes, chelicerae, pedipalpi and four pairs of walking legs. **3.** Abdomen without appendages ends into telson. **4.** Respiration by book lungs/trachea, excretion by Malpighian tubules/coxal glands. **5.** Oviparous , few are viviparous. |
| **Scorpion** | **1.** It is nocturnal, found under stones/bark of trees. **2.** Carnivorous, predacious, cannibalistic. **3.** Body divided prosoma, ophisthosoma and metasoma. **4.** Prosoma bears a pair of median eyes, 2 – 5 pairs of lateral eyes and six pairs of appendages **5.** Metasoma ends into poison sting or telson. **6**. Viviparous. |

**2) *Cyclop***

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| **Kingdom:** Animalia | **1.** Nutrition heterotrophic. 2. Control and Coordination mechanisms well developed. |
| **Subkingdom:** Metazoa | Multicellular animals. |
| **Division:** Bilateria | Triploblastic animals with bilateral symmetry. |
| **Subdivision :** Coelomata | Presence of true coelom. |
| **Phylum:** Arthropoda | **1.** Body with jointed appendages. **2.** Compound eyes, open circulatory system and cuticular exoskeleton. **3.** Respiration by gills, book lungs or trachea. **4.** Excretion by Malpighian tubules, green glands or coxal glands. **5**.Unisexual animals. |
| **Sub-phylum:** Mandibulata | **1.** Body divisible into head, thorax and abdomen. **2.** Head with paired antennules, antennae, compound eyes, mandibles and maxillae. |
| **Class:** Crustacea | **1.** Mostly aquatic. **2**. Head often fused with thorax to form cephalothorax.  **3.** Respiration by gills, excretion by green glands or coelomoducts.  **4.** Thorax and abdomen have biramous appendages. **5.** Development indirect. |
| **Cyclop** | Carapace and compound eyes absent; abdomen without appendages but with a pair of caudal styles. |

1. **Centipede**

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| **Kingdom:**  Animalia | **1.** Nutrition heterotrophic. 2. Control and Coordination mechanisms well developed. |
| **Subkingdom:** Metazoa | Multicellular animals. |
| **Division:** Bilateria | Triploblastic animals with bilateral symmetry. |
| **Subdivision :** Coelomata | Presence of true coelom. |
| **Phylum:** Arthropoda | **1.** Body with jointed appendages. **2.** Compound eyes, open circulatory system and cuticular exoskeleton. **3.** Respiration by gills, book lungs or trachea. **4.** Excretion by Malpighian tubules, green glands or coxal glands. **5**.Unisexual animals. |
| **Sub-phylum:** Mandibulata | **1.** Body divisible into head, thorax and abdomen. **2.** Head with paired antennules, antennae, compound eyes, mandibles and maxillae. |
| **Class :** Myriapoda | **1.** Terrestrial, Air breathing animals. **2.** Body is elongated with numerous Segments each bearing one or two pairs of legs. **3.** Respiration by trachea, excretion by Malpighian tubules. |
| **Centipede** | **1.** Commonly found under stones, in damp places. **2.** Dorso-ventrally flat elongated body with numerous segments.**3.** Each trunk segment bears a pair of legs. **4.** Head distinct with a pair of antennae, mandibles and two pairs of maxillae. |

1. **Dragonfly**

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| **Kingdom:**  Animalia | **1.** Nutrition heterotrophic. 2. Control and Coordination mechanisms well developed. |
| **Subkingdom:** Metazoa | Multicellular animals. |
| **Division:** Bilateria | Triploblastic animals with bilateral symmetry. |
| **Subdivision :** Coelomata | Presence of true coelom. |
| **Phylum:** Arthropoda | **1.** Body with jointed appendages. **2.** Compound eyes, open circulatory system and cuticular exoskeleton. **3.** Respiration by gills, book lungs or trachea. **4.** Excretion by Malpighian tubules, green glands or coxal glands. **5**.Unisexual animals. |
| **Sub-phylum:** Mandibulata | **1.** Body divisible into head, thorax and abdomen. **2.** Head with paired antennules, antennae, compound eyes, mandibles and maxillae. |
| **Class:** Insecta | **1.** Air breathing, terrestrial or aquatic. **2.** Body divisible into head, thorax and abdomen. **3.** Thorax with three pairs of legs and two pairs of wings. **4.** Open circulatory system, respiration by trachea, excretion by Malpighian tubules. **5.** Development direct or indirect. |
| **Dragon-fly** | Mouth parts biting type; naiads aquatic with or without external gills. Presence of two pairs of membranous wings, long segmented abdomen, rectal gills, strong hunters. |

1. **Peripatus**

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| --- | --- |
| **Kingdom:**  Animalia | **1.** Nutrition heterotrophic. 2. Control and Coordination mechanisms well developed. |
| **Subkingdom:** Metazoa | Multicellular animals. |
| **Division:** Bilateria | Triploblastic animals with bilateral symmetry. |
| **Subdivision :** Coelomata | Presence of true coelom. |
| **Phylum:** Arthropoda | **1.** Body with jointed appendages. **2.** Compound eyes, open circulatory system and cuticular exoskeleton. **3.** Respiration by gills, book lungs or trachea. **4.** Excretion by Malpighian tubules, green glands or coxal glands. **5**.Unisexual animals. |
| **Sub-phylum:** Onychophora: | **1.** Most primitive arthropods. 2**.** Appendages not jointed but lobe like fleshy outgrowths. **3.** Head bears a pair of antennae, a pair of jaws and a pair of simple eyes. **4.** Slime glands are present. |
| **Peripatus** | **1.** It is terrestrial, nocturnal, found in crevices of rocks, under stones in moist dark places. **2.** Carnivorous and predaceous. **3.** Body is elongated, cylindrical measuring 2 to 3 inches in length. **4.** Velvety skin, wrinkled and with several small papillae. **5.**It is a connecting link between the Annelida and Arthropoda. |

***Reference A manual of practical Zoology Invertebrate, P.S Verma***

B) Mollusca

1) Class- Monoplacophora i) Neopilina

2) Class- Amphineura i) Chiton ii) **Chaetoderma**

3) Class- Scaphopoda i) Tusk-shell (Dentalium sp) ii) **Pulsellum**

4) Class - Gastropoda i) Murex ii) **Sea hare (Aplysia sp)**

5) Class – Pelecypoda i) **Unio ( Lamellidens marginalis)** ii) Nautilus

C) Echinodermata

1) Class- Asteroidea i) Astropecten ii) **Solaster**

2) Class- Ophiuroidea i) Ophiothrix ii) **Basket star ( Gorgonocephalus sp)**

3) Class- Echinoidea i) Sea Urchin (Echinus sp) ii) **Sand dollar (Clypeaster sp)**

4) Class - Holothuroidea i) Sea-Cucumber ( Holothuria sp) ii) **Thyone**

5) Class - Crinoidea i) Feather Star ( Antedon sp)