

## FUNCTIONAL ANATOMY OF CHORDATES

### **Unit No.1 Systematic position, habit and habitat, ext. characters, skin, locomotion & coelom of Scoliodon. (4 marks)**

#### **Q.1. Multiple choice questions (2 marks each)**

1. Scoliodon is -----.
  - a) Marine, herbivorous.
  - b) Fresh water, carnivorous.
  - c) Marine, carnivorous & predator.
  - d) Fresh water, omnivorous.
2. Scoliodon is member of class-----.
  - a) Osteichthyes.
  - b) Chondrichthyes.
  - c) Amphibia.
  - d) None of these.
3. Scoliodon is -----.
  - a) Viviparous.
  - b) Oviparous.
  - c) Ovoviviparous.
  - d) None of these.
4. The body of Scoliodon is divided into -----.
  - a) Head and Trunk.
  - b) Head, trunk & tail.
  - c) Head, neck, trunk & tail.
  - d) Head, neck & tail.
5. The skin of scoliodon is covered with -----.
  - a) Dermal scales.
  - b) Cycloid scales.
  - c) Ctenoid scales.
  - d) Placoid scales.
6. Tail of Scoliodon is -----.
  - a) Homocercal.
  - b) Heterocercal.
  - c) Hypocercal.
  - d) Hypercercal.
7. The pericardial and abdominal cavity in the Scoliodon communicate with one another through -----.
  - a) Peritoneal canal.
  - b) Pericardio-peritoneal canal.
  - c) Abdominal canal.
  - d) Pericardio-periabdominal canal.
8. The pericardial and abdominal cavity in Scoliodon is separated by -----.
  - a) Septum transversum.
  - b) Septum longitudinum.
  - c) Diagonal septum.
  - d) Muscle sheath.
9. Scoliodon is commonly called as -----.
  - a) Dog fish.
  - b) Lung fish.
  - c) Marine fish.
  - d) Flying fish.

#### **Q2. & Q.4. Short notes/sketch and label (4 marks each).**

1. Systematic position, habits & habitat of Scoliodon.
2. Functions of skin of Scoliodon.
3. Placoid scales of Scoliodon.
4. Locomotion in Scoliodon.
5. Coelom in Scoliodon.
6. Sketch & label- Scoliodon.

#### **Q.3. a) Questions for 3 marks (3 marks each)**

1. Sketch & label - Placoid scales of Scoliodon.
2. Sketch & label - Coelomic body cavities of Scoliodon.

**Q.3.b) & Q.5. b) (2 marks each)**

1. Heterocercal tail.
2. Gill clefts.
3. Clasper.

**Unit No.2 Anatomy- digestive system & its physiology. (8 marks)****Q.1. Multiple choice questions (2 marks each)**

1. The teeth in Scoliodon are adapted for -----.
  - a) Holding and tearing.
  - b) Biting.
  - c) Chewing.
  - d) Biting, tearing & chewing.
2. Dentition in Scoliodon is -----
  - a) Heterodont & diphyodont.
  - b) Heterodont & polyphyodont.
  - c) Homodont & diphyodont.
  - d) Homodont & polyphyodont.
3. Scroll valve present in the intestine of Scoliodon takes-----turns.
  - a) one & half.
  - b) two & half.
  - c) Three & half.
  - d) Five & half.
4. Liver of Scoliodon is -----
  - a) Single lobed.
  - b) Bilobed.
  - c) Trilobed.
  - d) Four lobed.

**Q2. & Q.4. Short notes/sketch and label (4 marks each).**

1. Scroll valve of scoliodon.

**Q3. a) Questions for 3 marks (3 marks each).**

1. Physiology of digestion in Scoliodon.

**Q5. a) Questions for 6 marks.**

1. Alimentary canal of Scoliodon.
2. Digestive glands of Scoliodon.

**Q3.b) & Q.5. b) (2 mark each).**

1. Define digestion.
2. Bursa entiana.
3. Food & feeding in Scoliodon.

**Unit No.3 Respiratory system, physiology. (4 marks)****Q.1. Multiple choice questions (2 marks each)**

1. -----pairs of gill-slits are present in Scoliodon.
  - a) 3
  - b) 5
  - c) 6
  - d) 7
2. A complete gill is called -----.
  - a) Hemibranch.
  - b) Holobranch.
  - c) Abranch.
  - d) Lamilliform.

**Q2. & Q.4. Short notes/sketch and label (4 marks each).**

1. Mechanism of respiration in Scoliodon.
2. Sketch & label the breathing mechanism in Scoliodon.
3. Sketch & label holobranch in Scoliodon.

**Q.3. a) Questions for 3 marks (3 marks each).**

1. Physiology of respiration.

**Q.5. a) Questions for 6 marks.**

1. Describe the respiratory system of Scoliodon.

**Q.3.b) & Q.5. b) (2 mark each).**

1. Holobranch.
2. Vestigeal gill pouch.

**Unit No.4 Circulatory system, blood, arterial system, venous system, renal portal system, lateral abdominal & cutaneous system. (10 marks)****Q.1. Multiple choice questions (2 marks each).**

1. The heart of Scoliodon receives-----.
  - a) Venous blood.
  - b) Both venous and arterial blood.
  - c) arterial blood.
  - d) Blood only from gills.
2. The 'S' shaped heart of Scoliodon is differentiated into-----.
  - a) Sinus venosus, auricle & ventricle.
  - b) One auricle & one ventricle.
  - c) Auricle, ventricle & conus arteriosus .
  - d) Sinus venosus, auricle, ventricle & conus arteriosus.
3. The heart of Scoliodon is -----.
  - a) Single chambered .
  - b) Two chambered.
  - c) Three chambered.
  - d) Four chambered.
4. Sinus venosus receives blood from-----.
  - a) Ductus cuvieri.
  - b) Ductus cuvieri & hepatic sinuses.
  - c) Ventral aorta.
  - d) Hepatic Sinuses.
5. Erythrocytes in Scoliodon are-----.
  - a) Circular, enucleated. b) Circular, nucleated.
  - c) Oval, nucleated.
  - d) Oval, enucleated.

**Q2. & Q.4. Short notes/sketch and label (4 marks each).**

1. Working of heart of Scoliodon.
2. Ventral aorta & afferent branchial arteries.
3. Arteries of head of Scoliodon.
4. Efferent branchial & epibranchial arteries.
5. Hepatic portal system of Scoliodon.
6. Renal portal system of Scoliodon.
7. Sketch & label Heart of Scoliodon.
8. Sketch & label the arterial system of Scoliodon.
9. Sketch & label the venous system of Scoliodon.

**Q.3. a) Questions for 3 marks (3 marks each).**

1. Hypobranchial blood plexus in Scoliodon.

**Q.5. a) Questions for 6 marks.**

1. Dorsal aorta & its branches.
2. Heart of Scoliodon.

**Q.3.b) & Q.5. b) (2 mark each).**

1. Conus arteriosus.
2. Inferior jugular sinus.
3. Orbital sinus.
4. Ductus Cuvieri.

## **Unit No.5 Nervous system, Central nervous system, peripheral & autonomous nervous system. (8 marks)**

### **Q.1. Multiple choice questions (2 marks each)**

1. Cranial nerves arising from the mid brain of Scoliodon-----.
  - a) III & IV.
  - b) IV & V.
  - c) V & VI.
  - d) VI & VII.
2. Corpora restiformia is present in -----.
  - a) Cerebrum .
  - b) Cerebellum.
  - c) Mid brain.
  - d) Medula oblongata.
3. Foramen of Monro in Scoliodon is the opening between-----.
  - a) Cavities of cerebrum.
  - b) I & II ventricle of cerebrum & III ventricle.
  - c) III & IV ventricle.
  - d) Olfactory sacs.
4. The cranial nerve numbered as '0' in Scoliodon is -----.
  - a) Optic.
  - b) Olfactory.
  - c) Terminal or pre-olfactory.
  - d) Oculomotor.
5. Mid brain encloses a narrow canal called -----.
  - a) Optic lobes.
  - b) Iter.
  - c) Diocoel.
  - d) None of these.
6. Cavities of optic lobe is -----.
  - a) Paracoel
  - b) Epicoel
  - c) Optocoel
  - d) Metacoel
7. The blood of Scoliodon is -----.
  - a) Bluish.
  - b) Reddish.
  - c) Greenish.
  - d) Colourless.
8. Cavities of Medula oblongata is -----.
  - a) Paracoel.
  - b) Epicoel.
  - c) Optocoel.
  - d) Metacoel.

### **Q2. & Q.4. Short notes/sketch and label (4 marks each)**

1. Fore Brain of Scoliodon.
2. Hind Brain of Scoliodon.
3. Cavities of Brain.
4. Sketch & label dorsal view of brain of Scoliodon.
5. Sketch & label Ventral view of brain of Scoliodon.
6. Sketch & label Ventricles of brain of Scoliodon.

### **Q.3. a) Questions for 3 marks (3 marks each)**

1. Autonomic nervous system of Scoliodon.

### **Q.5. a) Questions for 6 marks**

1. Cranial nerves of Scoliodon.

### **Q.3.b) & Q.5. b) (2 mark each).**

1. Cerebrum.
2. Diencephalon.
3. Medulla oblongata.
4. Optic lobes.
5. Cerebellum.
6. Crura cerebri.

**Unit No.6 Sense organs, olfactory organs, photoreceptors, statoacoustic organs, lateral line receptors, neuromast & pit organs, ampullae of Lorenzini** **(6 marks)**

**Q.1. Multiple choice questions (2 marks each)**

1. -----semicircular canals are found in internal Ear of Scoliodon.
  - a) One.
  - b) Two.
  - c) Three.
  - d) Four.
2. Eye of Scoliodon has muscles-----.
  - a) Five.
  - b) Six.
  - c) Eight.
  - d) Seven.
3. Ampullae of Lorenzini are -----.
  - a) Photoreceptors.
  - b) Thermoreceptors.
  - c) Rheoreceptors.
  - d) Tangoreceptors.
4. Stato-acoustic organ is another name of-----.
  - a) Eye.
  - b) Pinna.
  - c) Internal ear.
  - d) Ear.
5. The retina of Scoliodon contains photosensitive cells called-----.
  - a) Cones.
  - b) Rods.
  - c) Rods & cones.
  - d) None of these.
6. Olfactory sacs are -----.
  - a) Photoreceptors.
  - b) Thermoreceptors.
  - c) Rheoreceptors.
  - d) Chemoreceptors.

**Q2. & Q.4. Short notes/sketch and label (4 marks each)**

1. Membranous labyrinth.
2. Olfactory organs.
3. Photoreceptors.
4. Eye ball muscles.
5. Sketch & label Ampullae of Lorenzini.
6. Sketch & label T.S. of olfactory sac of Scoliodon.

**Q.3. a) Questions for 3 marks (3 marks each)**

1. Sketch & label Membranous labyrinth of Scoliodon.

**Q.5. a) Questions for 6 marks**

1. Photoreceptors & working of eyes in Scoliodon.

**Q.3.b) & Q.5. b) (2 mark each).**

1. Neuromast organ.
2. Lateral line receptor.
3. Pit organ.

**Unit No.7 Urinogenital system, male & female Urinogenital system, reproduction, copulation, fertilization & development. (8 marks)**

**Q.1. Multiple choice questions (2 marks each)**

1. Vagina of Scoliodon is formed by the union of-----.
  - a) Uteri.
  - b) Ureters.
  - c) Vas deferens.
  - d) Vasa efferentia.
2. Spermatozoa in Scoliodon are stored in -----.
  - a) Apopyle.
  - b) Testes.
  - c) Siphon.
  - d) Seminal vesicle.

3. Accessory parts of male reproductive system comprises-----.
  - a) Oviduct.
  - b) Epigonal organ.
  - c) Mesovarium.
  - d) Siphon.
4. Clasper bears a dorsal groove with anterior opening known as-----.
  - a) Apopyle.
  - b) Sperm sac.
  - c) Hypopyle.
  - d) Siphon.

**Q2. & Q4. Short notes/sketch and label (4 marks each).**

1. Sketch and label the Male urinogenital system of Scoliodon.
2. Sketch and label the Female Reproductive system of Scoliodon.
3. Sketch and label the Scoliodon Embryo with placenta.
4. Sketch and label the mermaids purse of Scoliodon.
5. Development of Scoliodon.
6. Male reproductive organs of Scoliodon.
7. Female reproductive organs of Scoliodon.

**Q3. a) Questions for 3 marks (3 marks each)**

1. Sketch and label the mermaids purse of Scoliodon.
2. Development of Scoliodon.

**Q3.b) & Q5. b) (2 mark each).**

1. Mermaid's purse.
2. Yolk sac placenta.
3. Copulation in Scoliodon.
4. Shell gland.
5. Mullerian duct.

**Unit No.8 General Topics - Accessory respiratory organs in fishes, Air bladder in bony fishes, Parental care in amphibians, Neoteny & Paedogenesis. (12 marks)**

**Q1. Multiple choice questions (2 marks each)**

1. Accessory Respiratory organs in fishes help in -----.
  - a) Respiration.
  - b) Metabolism.
  - c) Spawning.
  - d) None of these.
2. Which of the following is not a function of air bladder-----.
  - a) Respiration.
  - b) Sound production.
  - c) Reproduction.
  - d) Hydrostasis.
3. Which of the following is not an accessory respiratory organ in fishes?
  - a) Pectoral fins.
  - b) Pelvic fins.
  - c) Skin or integument.
  - d) Gut epithelium.
4. Paedogenesis refers to -----.
  - a) Precocious development of gonads.
  - b) Retgressive metamorphosis.
  - c) Retention of larval characters by adults.
  - d) Retention of rudimentary characters in adults.
5. Neoteny refers to -----.
  - a) Reproduction in larval forms.
  - b) Metamorphosis.
  - c) Retention of rudimentary organs.
  - d) Retention of larval characteristics in adults.
6. Partial neoteny refers to -----.

- a) Delayed metamorphosis due to ecological or Physiological changes in environment.
- b) Animal fails to hibernate.
- c) Animal remains larval throughout.
- d) Sexual reproduction.

**Q2. & Q4. Short notes/sketch and label (4 marks each)**

- 1. Functions of air bladder.
- 2. Sketch & label Accessory respiratory organs in Clarias.
- 3. Axolotl larva.
- 4. Sketch & label Accessory respiratory organs in Anabas.
- 5. Sketch & label Accessory respiratory organs in Amphipnous.
- 6. Sketch & label Accessory respiratory organs in Channa.

**Q3. a) Questions for 3 marks (3 marks each)**

- 1. Arborescent organs
- 2. Air bladder.
- 3. Neoteny.
- 4. Parental care in order Apoda.

**Q5. a) Questions for 6 marks.**

- 1. Air bladder or Swim bladder in bony fishes.
- 2. Parental care in order Anura.
- 3. Parental care in order Urodela.

**Q3.b) & Q5. b) (2 mark each).**

- 1. Labyrinthiform organs.
  - 2. Accessory Branchial chamber.
  - 3. Accessory respiratory organs.
  - 4. Red gland.
  - 5. Rete mirabile.
  - 6. Gular pouch.
  - 7. Parental care.
  - 8. Paedogenesis.
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