QP CODE: 18103395

B. SC. Degree (CBCS) Examination November 2018

Third Semester

Core Course: ZY3CRT03 Animal Diversity-Chordata

2017 admission onwards

Part A - Answer any 10 questions

1. What are Chondrichthyes?

Chondrichthyes are cartilaginous fishes Eg: Shark, Rays etc... (1/2+1/2 mark)

2. Comment on tail shift in larvaceae

In Larvaceae when the trunk is fully developed, the larva undergoes tail shift, in which the tail moves from a rearward position to a ventral orientation and twists 90^0 relative to the trunk.

3. What is Tunic?

In Urochordates, the whole body is encased within a tough and leathery covering called test or tunic made of tunicine.

4. What are Trophozooids?

Individuals concerned with nutrition. Eg: coelenterate. (If attempted, give full credit)

5. Comment on Hatscheks pit in Amphioxus

A glandular mucous-secreting groove running along the roof of the vestibule for food collection.

6. Comment on Narcine

Narcine is a cartilaginous fish popularly known as electric ray and characterised by the presence of a pair of electric organ that can generate electricity to immobilize the prey and to scare away enemies.(any 2 points)

7. Comment on Climbing Perch

It is a Teleost fish. It is provided with accessory respiratory organ (Labyrinthine organ) and scientific name is *Anabas testudineus.* With the help of labyrinthine organ, the fish can live out of water for six or seven hours. (any 2 points)

8. Name the classes under superclass Tetrapoda

Amphibia, Reptilia, Aves, Mammalia (1/4 marks each)

9. Assign the following to the respective orders a) Hyla b) Amblystoma

a) Hyla: Order Anura b) Amblystoma: Order Urodela (1/2 marks each)

10. Give the scientific name of common frog

Ans: *Rana hexadactyla* or *Euphlyctis hexadactyla*

11. What are perineal glands

These are modified sebaceous glands situated under skin near anus and open into hairless depression called perinaeal pouches. It produce a secretion with a characteristic odour of Rabbit.

12. What are baleen plates

In Blue Whales, teeth are replaced by triangular plates that hang from the palate in rows. They are known as baleen plates and which help in filter feeding. (1/2+1/2 mark)

PART B Answer any six questions. 5 marks

13. What are the characteristic features of Urochordata

1. In Urochordates notochord is confined to the tail region of the larva and hence the name Urochordata 2. Body is enveloped in test or tunic, made of tunicine, hence it known as tunicates 3. Presence of Mouth and Atriopore 4. Pharynx is enlarged and perforated by numerous gill slits 5. Exhibits retrogressive metamorphosis 6. Alternation of generation can be seen. **(any 5 points with explanation)**

14. Mention the salient features of Ostracoderms and give an example

1. Ostracodermi are the first vertebrates to appear in the fossil series, which flourished in Silurian and Ordovician and became extinct in late Devonian. 2. They were small, extinct, fish like, heavily armoured and jawless vertebrates.3. Filter feeders and bottom dwelling fresh water forms 4. Front part of body was covered with thick shield of bony plates.5. Hind part is covered with mineralised scales. 6. Median fins are present.7. Single nostril on the top of the head (monorhine condition). Example: Cephalaspis, Paraspis, Astraspis etc.**(any 5 points with explanation- 4.5+0.5 marks)**

15. Mention the salient features of Holocephali

They are very ancient group of cartilaginous fishes. Spiracles and cloaca are absent. Upper jaw is fused with the cranium and hence the name holocephali. Skull is modified due to the presence of flat bony plates called tritural plates. Skin is naked with very few placoid scales on the claspers.Extra claspers, four pairs of gill slits, intestinal spiral valves, hyostylic jaw suspension, unconsticted notochord, reduced and nodule like vertebrates. Urinary and genital openings are separate. Eg: Chimaera. **(any 5 points with explanation)**

16. Explain the different kinds of scales in fishes

On the basis of structure, fish scales are classified into placoid scale and non placoid types. Non-placoid scales are of three kinds, cosmoid, ganoid and bony ridge scales.

Placoid scale: Placoid scale are plate like scale found in cartilaginous fishes. Scale has a disc like basal plate embedded in dermis and spine or cusp, projecting out of the skin. Spine is formed of dentine. It encloses a central pulp cavity filled with pulp. Dentine is coated with an enamel like substance called vitrodentine.

Cosmoid: mesodermal in origin. Scale has 3 layers, outer cosmine, middle vascular and inner isopedin layer. Cosmine layer is externally coated by a thin layer of vitrodentine. Cosmoid scales are found in coelacanths and extinct lobe-finned fishes and early lung fishes.

Ganoid: Ganoid scales are rhomboidal and diamond shaped. They are mesodermal in origin. It has 4 layers, outermost ganoine layer, cosmine, vascular and innermost isopedin layer. Ganoid scale are found in Polypterus and Lepidosteus.

Bony ridge scale includes cycloid scales and ctenoid scales

Cycloid scales: They are circular or elliptical. They are characterised by numerous concentric rings around a central nucleus or focus. They are thick in centre and thin towards the margin. Cycloid scales are common among teleosts.. eg

Ctenoid Scales: Structurally similar to cycloid scales and difference is the prescence of spiny combe-like posterior margin and anterior margin is thin and bears lamination. eg.

(5x1=5 marks)

17. Write notes on a)Synsacrum b)Pygostyle

For cutting the air in flight the thin and light endoskeleton of birds is made strong and rigid. Fusion makes the bone rigid and strong to withstand the sudden and high stresses of aerial acrobatics. Fusion of vertebrae to form Synsacrum and Pygostyle make the axial support of the body strong. In pigeon, Synsacrum is formed by the fusion of 14 vertebrae-last posterior thoracic, 6 lumbar, 2 Sacral and 5 anterior caudal vertebrae. The pygostyle is formed by the fusion of last three to four vertebrae. **(3+2=5 mark)**

18. Mention the modifications of the endoskeleton of Birds for flight

1. Bones are Pneumatic, filled with air spaces and spongy

2. The skull bones are thin and papery, reduced in number and firmly fused.

3. Teeth are lacking

4. The vertebrae are fused-Synsacrum-provides firm fulcrum for the action of wings

5. Hetercoelous vertebrae and 180^0 movement of neck is possible

6. Presence of Pygostyle

7. Presence of single occipital condyle, as result of which the head can be turned freely from side to side.

8. The sternum with well developed keel serves for the attachment of flight muscle

9. The modification of coracoids (stout), clavicle (furcula)

10. Sternum(keel)are essential for strong and sustained flight.

(any 5 points with explanation OR 10 Points)

19. Justify the statement ‘Prototherians are unfinished mammals’

They exhibit both mammalian and reptilian characters. Reptilian characters like egg laying, ureters opening into cloaca, absence of scrotal sacs seminal vesicles and prostrate glands, absence of corpus callosum etc. prove its affinity to a primitive group of mammals which is very remote to the higher mammals. Give 2 Eg: Echidna, Tachyglossus**.(any 5 points-4+1=5 marks)**

20. Give an account on pouched mammals

Metatheria include pouched mammals. They are viviparous. Egg and embryos lie free in the uterus and no placenta is formed. Young are born after a short period of gestation. A marsupium or pouch is developed from the fold of the skin on the lower part of the belly of the female. The young ones crawl into the pouch. The mammary glands are present and open in the pouch, where the young ones feed and develop. In pouched mammals cloaca is absent and skull bones are joined by sutures. Corpus callosum is absent. Eg: Macropus **.(any 5 points with explanation- 4.5+0.5 =5 marks)**

21. Differentiate between Perissodactyla and Artiodactyla

S. No	Perissodactyla	Artiodactyla
1	Odd-toed ungulates adapted for swift running	Even-toed ungulates
2	The middle digit of fore and hindlimbs is predominant and carries most of the weight	Fore and hind limbs bear two or rarely 4 digits
3	Lophodont dentition	Selenodont or bunodont dentition
4	Stomach is simple	Stomach is compound-Ruminent
5	Mammae are inguinal	Mammae are few and inguinal or many and abdominal
6	Placenta is diffuse and epitheliochorial	Placenta is diffuse or cotyledonary
7	Eg: Horse, Zebra, Rhinoceros etc...	Eg: Pig, Deer, Camel, Sheep etc...

(any 5 differences and an example)

PART C

Answer any two - 10 marks

22. Essay on Migration in fishes

Definition: Directional mass movement of the members of a species from one habitat or environment to another for feeding, spawning, protection from unfavourable climate etc.

1 mark

Based on purpose-4 kinds of migration-Climatic or wintering migration, Alimental or feeding migration, Gametic or spawning migration, Osmoregulatory migration-**3 marks**

4 kinds of spawning migrations-Local, Potamodromy, Oceanodromy and diadromous migration

Diadromous migration- Anadromous and Catadromous- Explain with suitable examples **4 marks**

Advantages of fish migration-**2 mark**

23. Describe the salient features of class Reptilia and classify upto subclass giving suitable example

Any 6 salient features of class Reptilia- **2marks**

Skin is hard due to keratinisation, Exoskeleton consists of epidermal scales, plates, scutes and spines, Two pairs of pentadactyl limbs end in claws, Vertebrae are gastrocentrous and procoelous, Skull is monocondylian, Pectoral girdle is characterised by an interclavicles, Heart is incompletely 4 chambered and exception can be seen in crocodile, Truncus arteriosus is absent,Respiration by lungs, Metanephric kidney, Fertilization is internal; eggs are macrolecithal, cledoic and amniote

Based on the number and presence or absence of temporal fossae reptiles are grouped under 4 sub-classes

1. Anapsida-No temporal fossae Eg: Chelone

2. Synapsida-Only lateral temporal fossae present Eg: Cynognathus

3. Parapsida: Only supra-temporal fossae present Eg: Icthyosaurs

4. Diapsida: Supratemporal and infratemporal fossae present - **2marks each-8marks**

24. Outline classification of class mammalia

Subclass Prototheria- Considered as unfinished mammals. They exhibit both mammalian and reptilian characters. Reptilian characters like egg laying, ureters opening into cloaca, absence of scrotal sacs seminal vesicles and prostrate glands, absence of corpus callosum etc. prove its affinity to a primitive group of mammals which is very remote to the higher mammals.Eg: Tachyglossus-**1mark**

Subclass Metatheria- Metatheria includes pouched mammals. They are viviparous. Egg and embryos lie free in the uterus and no placenta is formed. Young are born after a short period of gestation. A marsupium or pouch is developed from from the fold of the skin on the lower part of the belly of the female. The young ones crawl into the pouch. The mammary glands are present and open in the pouch, where the young ones feed and develop. In pouched mammals cloaca is absent and skull bones are joined by sutures. Corpus callosum is absent. Eg: Macropus -1**mark**

Subclass Eutheria-True mammals, highly organized allantoic placenta. Testes are enclosed in scrotal sac. Well developed mammary glands and corpus callosum. Ribs are double headed

It is divided into 16 orders

Order Insectivora - Eg:Talpa	Edentata: Armadillo
Dermoptera: Galeopithecus	Pholidota: Manis
Chiroptera: Pteropus	Proboscidea:Elephas
Primates: Loris	Hydracoidea: Procavia
Carnivora: Panthera	Sirenia: Dugong
Perissodactyla: Rhinoceros	Artiodactyla: Camel
Lagomorpha: Rabbit	Rodentia: Hystrix
Tubulidentata: Orycteropus	Cetacea: Delphinus - **8marks**

25. Write an essay on dentition in mammals

Dentition-Definition- **1 marks**

Structure of mammalian tooth-development of tooth—4 **marks**

Hypsodont and brachydont dentition-Heterodont dentition- Incisors, canine,premolar and molar, Thecodont dentition, Diphyodont dentition-—4 **marks**

Based on cusp pattern-Bunodont, Lophodont, Selenodont and Secodont teeth.

Dental formula-- **1 marks**