Reptilia

Very Short Answer Questions

1. **What are Jacobson's organs?**
   - Jacobson's organs are a pair of pouches that connect with the nose and with the mouth in vertebrates. These are concerned with the olfaction (smell) of food in the mouth.
   - These are vomeronasal organs. They are well developed in snakes and some lizards.

2. **Distinguish between penis and hemipenes of reptiles.**
   - In reptiles, males possess single penis consisting of the corpus cavernosum or a pair of hemipenes without erectile tissue.

3. **Name the type of eggs of reptiles based on yolk. Which type of cleavage occurs in them?**
   - Reptile eggs are called megalecithal eggs with large amount of yolk. Eggs are cleidoic with shelled nature.
   - Meroblastic cleavage occurs in them.

4. **Distinguish between synapsid skull and parapsid skull.**
   - **Synapsid skull:** The skull with a pair of infra-temporal fossae, one on either side. They are bordered above by the post-orbital and squamosal bones.
   - Ex. *Cynognathus*,
   - **Parapsid skull:** The skull with one pair of supra-temporal openings, one on either side. These are bordered below post-frontal and supra-temporal bones.

   Ex. *Ichthyosaurus* of the subclass Icthypterygia.

5. **Distinguish between temporal fossae and temporal bars.**
   - Temporal fossae are bounded by bony arches present in temple region, enabling jaw muscles to bulge into them.
   - Post-orbital and squamosal present just below the supra-temporal fossa and form temporal bars or archs.

6. **What are temporal fossae? Name the bones that form the upper temporal bar.?**
   - Temporal fossae are bounded by bony arches present in temple region, enabling jaw muscles to bulge into them.
   - Post-orbital and squamosal present just below the supra-temporal fossa and form temporal bars or archs.

7. Name the dorsal and ventral parts of shell of chelonians.

- Chelonian body is enclosed a shell made of bony dermal plates covered **by keratinized scales or shields or scutes.**
- **The dorsal shell is carapace** and the ventral shell called plastron.

8. What is ductus arteriosus? Name the group of extant reptiles having ductus arteriosus.

- It is a small blood vessel, which connects systemic arch with pulmonary arch.
- Chelonia or Testudinea having ductus arteriosus.
- Ex. *Testudo*, *Chelonia*.

9. Name the reptile with well-developed parietal eye, considered a living fossil.

- *Sphenodon* or Hatteria is the oldest surviving lepidosaurian and is considered as living fossil.
- Parietal eye is present in this reptile. It is sensitive to light.

10. What are uncinate processes? Name a group of reptiles having uncinate processes in their ribs?

- A cartilaginous process projecting posteriorly to overlap the rib behind in reptiles is called uncinate process.
- It strengthens the rib cage.
- Rhynchocephalia and Crocodilia group of reptiles having the uncinate process in their ribs.

11. Name the only reptile without copulatory organ. Why is it considered a living fossil?



- *Sphenodon* or Hatteria is without copulatory organ.
- As *Sphenodon* retained many primitive characters, it is called as a living fossil.

12. What are zygosphenes and zygantra? Which group of reptiles is characterized by the presence of zygosphenes and zygantra?

- Additional articulations of vertebrae called zygosphenes and zygantra..

- Squamata group of snakes and lizards having zygosphenes and zygantra.

13. Mention the scientific name and common name of the only two venomous lizards in the world.





- *Heloderma suspectum* and *Heloderma horridum* are the only two venomous lizards in the world.

14. Name the lizard in which eyes exhibit independent movement.?

- *Chameleon* exhibits independent movements of eyes.



15. Why are snakes sensitive mostly to earth-borne vibration rather than airborne vibrations?

- Snakes cannot hear air borne sounds due to the absence of tympanum.
- Snakes respond mainly to ground-borne vibrations due to attachment of columella auris to quadrate.

16. What are osteoderms? Name the order of extant reptiles characterized by the presence of osteoderms.?

- Bony plates covering the body of many reptiles and underlying the horny epidermal scales are called osteoderms.
- Crocodilia is the order in reptiles with osteoderms .

17. What is Foramen of Panizza?

- Foramen of Panizza connects the left and right systemic arches in crocodilians.

18. What is pro atlas? Which group of living reptiles is characterized by the present of proatlas?

- A small bone between the skull and atlas is called pro-atlas.
- Crocodilia group of living reptiles having the pro-atlas.

19. Mention four similarities between crocodiles and mammals?

- Crocodiles are reptiles. They show the following mammalian characters.

a. Thecodont dentition where teeth are present in jaw sockets.
b. Presence of four-chambered heart.
c. Presence of diaphragm.
d. Presence of complete bony secondary palate.

20. Which snakes are characterized by laterally compressed tail? Give an example.

- A Laterally compressed tail is present in sea snake.
- *Hydrophis, Enhydrina*.

21. Name the Indian pitless viper with two rows of sub-caudal scales. Why is it called chain viper?

- *Vipera russelii* or *Daboia russelii* (Russell's viper) is a pitless viper with two rows of sub-caudals.
- Dorsal surface body shows three rows of large black rings. So it is called chain viper.

22. Name the Indian pitless viper with single row of sub-caudal scales. What is the peculiarity of its scales?

- *Echis carinata* is the Indian pitless viper with single row of sub-caudal scales.
- Dorsal scales are keeled and serrated hence the name saw scaled viper.

23. What is cuneate plate? Name the snake with cuneate plate.

- Cuneate plate is present between 4^{th} and 5^{th} infra-labials.
- *Naja naja* or Indian cobra having cuneate plate.

24. Distinguish between neurotoxic venom and haemolytic venom.

- The venom of some snakes affects the respiratory center in the brain i.e., affects nervous system. This toxic is called neurotoxic venom. E.g., venom of sea snakes, cobras, coral snakes and kraits.
- The venom of some snakes breaks up the formed elements in the blood and attacks the lining of blood vessels. It is haemotoxic.
  E.g., Venom of Vipers.

25. Give an account of identification of sea snakes and vipers.

Ans. If the tail of a snake is flat, laterally compressed and oar-shaped (adaptation to swimming in water). It is a sea snake. All sea snakes are poisonous.

If the head is triangular and covered with small scales and not with shields, it is a viper. All vipers are poisonous.

26. Give an account of identification of cobras, coral snakes and kraits

Ans. **Cobra**: Presence of hood and large third supra labial touches the nasal shield and the eye. Sub-caudal are single in the cloacal region and double toward the tip of tail.

Coral snake: Hood is absent. Coral spots are present on the belly. A large third supra-labial touching the shield and eye as in the case of Cobras.

Krait snake: A large hexagonal vertebral and only four infra-labials (forth infra-labial is the largest). Sub-caudals are in a single row.

Short Answer Questions

1. Mention the general characters of Chelonia. Give two examples.

Ans. 1. These are commonly called turtles.
2. Mostly marine. Some are terrestrial or freshwater in nature.
3. Short and broad body. Limbs are paddle like in aquatic forms.
4. Body is enclosed in a bony shell made of bony dermal plates. Shell consists of dorsal carapace and ventral plastron.
5. Neural arches of vertebrae and ribs are fused with carapace.
6. Plastron is formed by the fusion of clavicles, interclavicles, and gastralia.
7. Jaws are edentate (without teeth)
8. Incomplete secondary plate is present.
9. Sternum is absent.
10. Ductus arteriosus (Ductus Botalli) is present (A small blood vessel connects the systemic arch with the pulmonary arch).
12. Cloacal aperture is longitudinal.
13. Males posses' single penis.
14. All are oviparous.

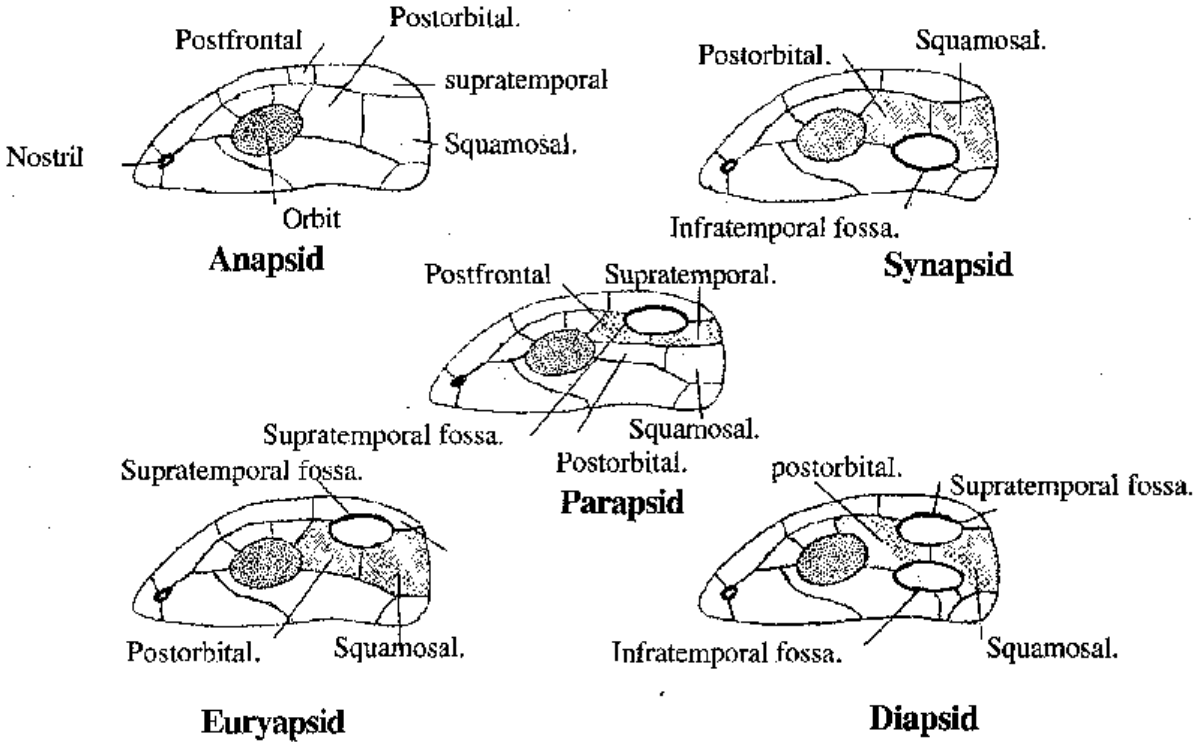
Ex. *Testudo* (tortoise), *Chelonia mydas* (green sea turtle)
Drmochelys coriacea (leather back turtle (largest living turtle)





2. Describe various types of skulls in reptiles based in temporal fossae.

Reptilian groups are based on the skull type depending on the temporal fossae



Types of skull in reptiles

Type of skull	Number & Position of Fossae	Bones	Subclasses	Order & Suborder	Eg.,
1.Anapsid	Absent	-----	Anapsida	Chelonia/ Testudinea	Testudo, Trionyx
2.Euryapsid	1 + 1 Supra temporal	Postorbital & squamosal	Synapto-- sauria	------	Plesiosaurus
3.Parapsid	1 + 1 Supra temporal	Postfrontal &Supra temporal	Ichthyopte— gia	------	Ichthyo--- saurus
4.Synapsid	1 + 1 Infra temporal	Postorbital & squamosal	Synapsida	-----	Cynognathus
5.Diapsid	2 + 2 Supra & Infra temporal	Postorbital & Squamosal	a)Lepido sauria	i)Rhyncho-cephalia	Sphenodon
				ii)Squamata a)Lacer— tilia	Lizards

				b)Ophidia	Snakes
			b) **Archo— sauria**	**Crocodilia**	Crocodylus, Alligator

3. Mention the general characters of Rhynchocephalia. *****

Ans. 1. Skin is covered by a granular scales and mid dorsal row of spines.
2. Body is lizard-like.
3. Limbs are relatively weak.
4. Skull is unmodified Diapsid type.
5. A cartilaginous Uncinate process is present for each of posterior cervical and anterior thoracic ribs to give strength to rib cage.
6. Vertebrae are amphicoelous type.
7. Dentition is acrodont and monophyodont.
8. Gastralia is present.
9. Cloacal aperture is transverse.
10. Copulatory organ is absent.
8. Internal fertilization is brought about by Cloacal apposition.
9. A well-developed parietal eye or penial eye is present.

E.g., *Sphenodon punctatus, Sphenodon guntheri*

4. Mention eight differences between lizards and snakes.

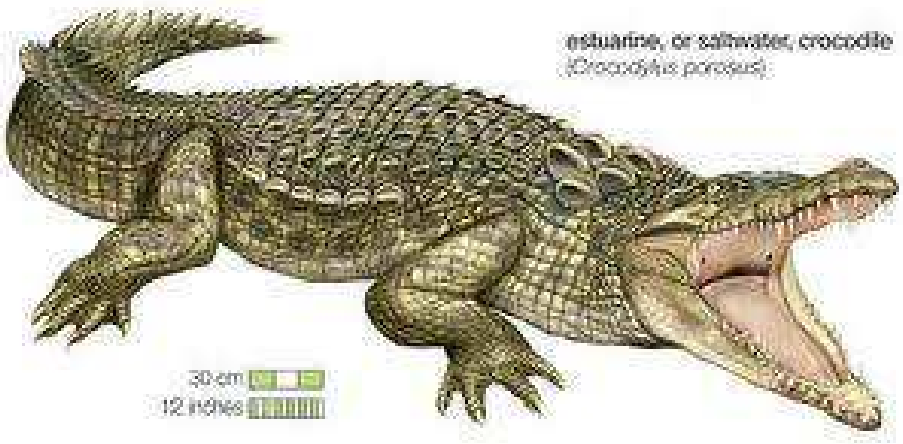
Ans.

Lizards	**Snakes**
1. Limbs, Girdles are present.	1. Limbs, Girdles are absent.
2. Lungs are symmetrical	2. Lungs are asymmetrical. Left lung is small or absent.
3. Ear drum and middle ear cavity are present	3. Tympanic membrane and middle ear cavity are absent.
4. Twelve pairs of cranial nerves.	4. Ten pairs of Cranial nerves.
5. sternum and episternum are present	5. Sternum and episternum are absent.
5. Eyelids are movable.	5. Eyelids are immovable.
6. Urinary bladder present.	6. Urinary bladder absent.

5. Mention the important general characters of Crocodilia or Loricata.

Ans. 1. These are the largest living reptiles.
2. Feet are webbed.
3. Fore limbs are shorter than hind limbs.
4. Strong and laterally compressed tail.
5. Osteoderms are present underneath horny epidermal scales.

6. Thoracic and abdominal cavities are separated by diaphragm.
7. A complete bony secondary palate is present.
8. A proatlas bone is present between skull and atlas.
9. Double headed ribs with capitulum and tuberculum.
10. Gastralia are present. Interclavicle is present.
11. Heart is four chambered.
12. Foramen of Panizza connects the left and right systemic arches.
13. Urinary bladder is absent.
14. Males possess an unpaired denis. Oviparous.
15. Longitudinal cloacal aperture.
16 .Dentition is Thecodont. (Teeth enclosed in jaw sockets).
e.g., *Crocodylus, Alligator, Caiman, Gavialis.*



8. Describe the venom apparatus of a venomous snake.

Ans. Venomous snake shows venom apparatus. Poison apparatus consists a pair of venom glands, ducts and fangs.

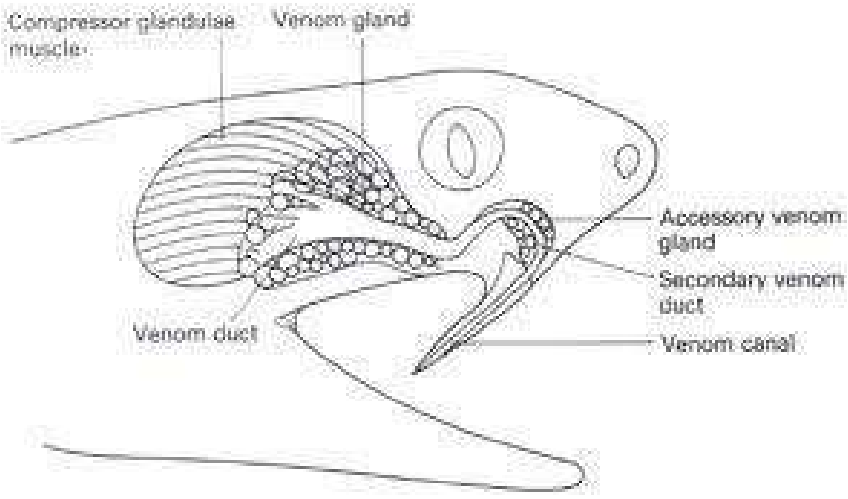
1. **Venom glands**: The venom glands are situated behind and below eyes. Venom glands of snakes are homologous to the Duvernoy's glands; A compressor muscle originates from lower jaw, sweeps around the venom gland and is inserted on the gland's surface in proteroglyphous and solenoglyphous snakes.

2. **Venom ducts:** A narrow venom duct leads from venom gland to the base of a fang.

3. **Fangs**: A pair of maxillary teeth modify into fangs. They act as hypodermic needles for the injection of venom into prey.

4. **Mechanism of snake Bite:** When a venomous snake strikes its preyp, the fangs pierce the skin.

The compressor muscle contracts and squeezes the venom gland. The venom flows through the venom duct and fang into the tissues of the prey.



9. Give an account of first aid and treatment of snake bite.

Ans. Snake venom is a mixture of toxins and enzymes.

Psychological confidence should be instilled to the patient as fear may cause heart failure and death even though the snake is non venomous.

A tourniquet is to be place above the region of the snake bite. It should not be applied tightly, but should be tied in such a way that it cannot prevent the circulation of venom into blood totally.

Antivenin or antivenom is used in the treatment of snake bite. If the snake is identified, treatment may be given with the concerned monovalent antivenin.

If the snake is not identified, polyvenin or polyvalent antivenin is to be given.

In India antivenins are produced at Haffkine Biopharmaceutical Corporation, Mumbai.

10. List out four important nonvenomous snakes giving the important characteristics.?



Ans. 1. **Typhlops :**

1. It is a commonly known as blind snake. Eyes are covered by scales and vestigial.
2. It looks like an earthworm. It is a small burrowing snake.
3. It is smallest snake.

2. **Python:** 
    1. It has vestigial hind limbs and pelvic girdle.
    2. Tail is short and prehensile.
    3. It kills prey by constriction.
    4. Scales of upper lip have depressions (labial pits) that are analogous to loreal pits.
    6. *Python molurus* is the Indian species.
    7. *Python reticulates* belongs to South East Asia is longer than anaconda.
3. ***Eryx Johnii*** : 
    1. *Eryx johnii* is commonly called as Sand Boa.
    2. Short and blunt tail resembles head.
    3. It kills the prey by constriction.
    4. Rudiments of hind limbs are seen as conical prominences.
4. ***Ptyas (Zamenis)***:
    1. It feeds on rats and hence is considered “friend of farmers”.
    2. It is viviparous.

Aves

Very Short Answer Questions

1. Name the only cutaneous gland in the birds. What is its function?

Ans. Uropygial or preen gland is the only large cutaneous gland in birds. It is present at the base of tail. It is weel developed in aquatic birds.

Bird preens (water proof) its feathers with its beak, obtaining oil of this gland.

2. How is synsacrum formed in birds? What is its significance?

Ans. Last thoracic; all lumbar, sacral and anterior few caudal vertebrae fuse to form a synsacrum.

** It fused with pelvic girdle and gives support to hind limbs.

3. What is carina? How is it useful to birds?

Ans. Carina or Keel is the mid ventral part of the sternum of a bird.

It is for the attachment of large fight muscles.

4. What is foramen triosseum? What is its functional significance?

Ans. Foramen triosseum is prsnt at the junction of clavicle, scapula and coracoid of a bird.

Tendon of Pectoralis minor muscle (Supracoracoideus) passes through this opening and acts as pulley.

5. What is the other name for furcula in birds? How is it formed?

Ans. Wishbone is the other name of furcula in birds.

Clavicle unites with interclavicle to form V-shaped furcula.

6. Name two important flight muscles in birds and mention their function.

Ans. A) Pectoralis major muscle: It helps in down stroke of the wing.

B) Pectoralis minor or supracoracoideus: It helps in upstroke of the wing.

7. What is Bursa of fabricius in birds?

Ans. Bursa of fabricius is a sac-like organ with lymphoid tissue.

It is present at the cloaca opening near the proctodaeum.

8. How many air sacks are associated with lungs of a bird? Name the unpaired air sac.

Ans. Nine air sacs are associated with lungs of a bird.

They are a) Interclavicular air sac. ---- Unpaired.

b)Cervical --- one pair

c)Anterior thoracic ---- one pair

d)Posterior thoracic ---- one pair

e)Abdominal ---- one pair.

9. Mention two features by which trachea of birds differs from that of mammals.

Ans. Trachea is often long and coiled in birds. Tracheal rings are bony and completed.
In mammals, trachea is supported by incomplete C – shaped cartilaginous rings.

10. What are sclerotic plates in the eye of birds?

Ans. Sclerotic palates are found in the sclerotic layer of eye in birds.
--- They help to maintain the shape of the eye in birds.

11. What is pecten in the eye of birds?

Ans. A comb shaped vascular pecten projects from retina into vitreous humour.
--- It probably nourishes retina and removes the metabolic waste from vitreous humour.

12. Name the feathers that cover the newly hatched bird. How do they differ from contour feathers?

Ans. Down feathers **cover** the newly hatched bird and provide excellent insulation.
--- Down feathers differ from contour feathers in the absence of rachis.

13. Distinguish between pterylae and apteria?

Ans. In birds the feathers are arranged in regular tracts called pterylae.
-- Featherless spaces are called apteria.

14. Name the fossil bird that is considered as connecting link between Reptilia and Aves. Mention two reptilian characters present in it.?

Ans. *Archaeopteryx lithographica* (lizard bird) is the connecting link between Reptilia and Aves.

1. Teeth are present on both the jaws.
2. Each wing had three clawed digits.
3. Amphicoelous vertebre.
4. Presence of gastralia

15. Mention two differences between the ribs of Archaeonithes and those of neornithes.

Ans.

Archaeornithes	**Neornithes**
1. Abdominal ribs (gastralia) are present.	1. Abdominal ribs are absent.
2. Ribs had no uncinate processes.	2. Thoracic ribs bear uncinate processes.

16. What is carpometacarpus in birds?

Ans. In birds the metacarpals are fused with distal carpals to form a carpometacarpus.

17. Name the super order to which penguins belong. Mention the scientific name of emperor penguin.

Ans. Penguins belong to the super order impennae.

The scientific name of emperor penguin is *Aptenodytes forsteri.*

18. Difference between altricial and precocial species.

Ans. Young ones of flying birds are altricial species. These are dependent on parents.

Young ones of flightless birds are precocial species. These are not dependent on parents.

19. Name two birds in which aftershaft of feathers are as long as the main shaft.

Ans. *Dromaius* or Emu and *Casuarius* of cassowary birds having aftershaft of feather is as long as the main shaft.

20. Name the bird with keen sense of smell. How does its eye differ from that of other birds?

Ans. *Apteryx* (Kiwi) bird posses keen sense of smell.

Eyes are without pecten in these birds.

21. Mention the scientific name and common names of National Bird of India and State Bird of Andhra Pradesh.

Ans. *Pavo cristaus* (peafowl) ; peacock is the National bird of India.

Coracious bengalensis (blue jay) ; is the Andhra Pradesh State bird.

Short Answer Questions

1. Justify the statement "Birds are glorified reptiles".?

Ans. T.H.Huxley called birds as Glorified reptiles because of the appearance of following advanced features in birds compared to reptiles.

1. Insulated body with feathers and scales
2. Homeothermal nature.
3. Presence of high metabolic rate.
4. Complete separation of venous and arterial blood.
5. Flying nature
6. Presence of cutaneous gland in the uropygial or preen gland.
7. Pneumatic bones.
8. Lungs with air sacs.
9. Well developed eyes.

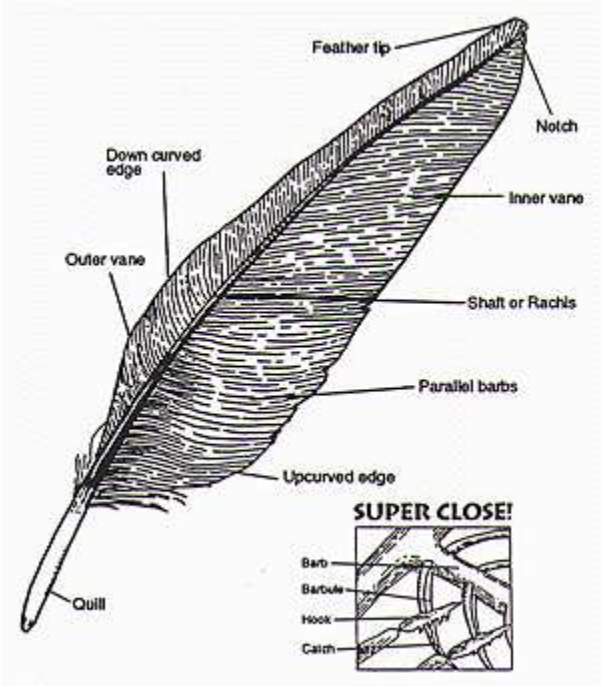
2. Describe the different types of feathers found in birds.

Ans. There are four types of feathers on the body of a bird. They are :

(i) Quill feathers, (ii) Contour feathers, (iii) Filoplumes, (iv) Down feathers

i) Quill Feathers: These feathers are used for flight. These are present on the wings and tail. Quills on wings are called remines and quills on tail are called rectrices.

Each quill feather consists of two parts.



(i) Quill, (ii) Vexillum (vane).

A**) QUILL or CALAMUS**: it is the proximal hollow part. The lower opening of the quill is called as inferior umbilicus, through which nutrients are supplied to feather.

--The second opening present at the junction of the quill and rachis is superior umbilicus.

At the region of the superior umbilicus, there is a small tuft of soft feathers known as after shaft or Hyporachis.

B) **VANE OR VEXILLUM**. It is an expanded portion.

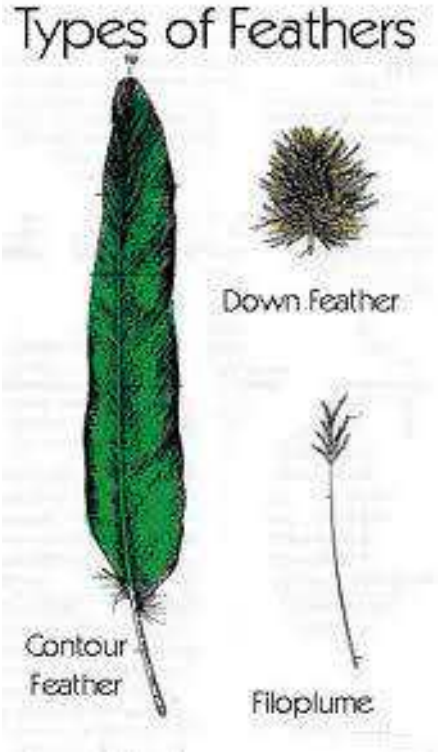
The vane has a central axis, rachis or shaft.

Vane is composed of barbs barbules and babicels with an interlocking mechanism by which the feather develops stiff resistance to air.

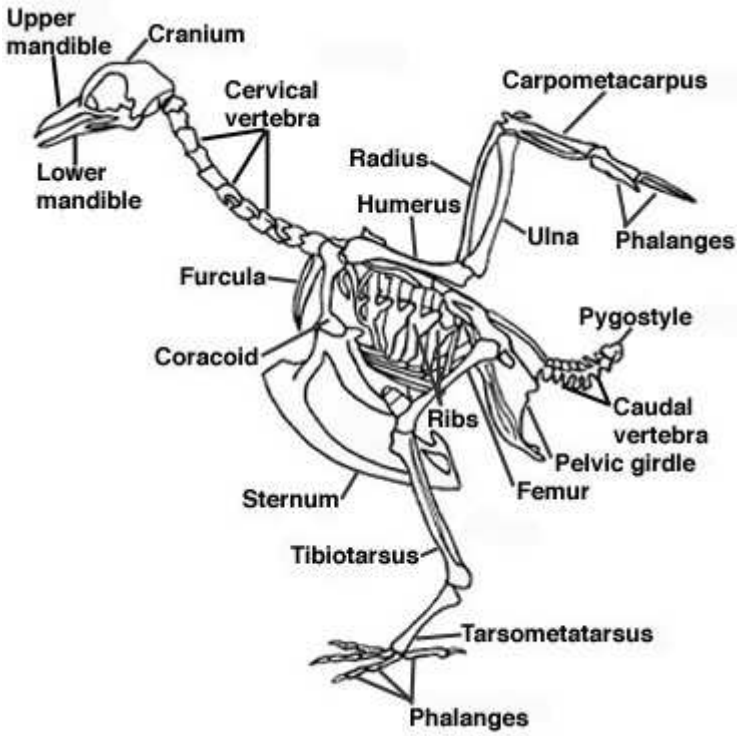
ii) Contour Feathers: These are similar to quill feathers but have poorly developed interlocking mechanism.They form general covering of the body

iii)Filoplumes : They are small delicate feathers with short calamus and weak barbs. They are sparsely distributed covering the interspaces..

iv) Down Feathers: These are small, soft and wooly feathers which differ from contour feathers in the absence of rachis. Barbs are long and flexible with sharp barbules. They form the covering of newly hatched birds and provide excellent insulation.



3. Explain important features of endoskeleton of birds.



1) Most of the bones are pneumatics with extensions of air sacs.
2) Skull is monocondylic.
3) Cervical vertebrae are heterocoelous.
4) Most of the birds have 2 sacral vertebrae.
5) Last thoracic, all lumbar, sacral and anterior few caudal vertebrae fuse to form a synsacrum. It gives support to hind limbs.
6) Last caudal vertebrae are fused to form pygostyle which supports tail feathers.
7) Sternum is with a mid ventral keel or carina for attachment of large flight muscles.
8) Ribs are double headed.
9) Thoracic ribs bear uncinate processes.
10) At the junction of clavicle, scapula and coracoids, a Foramen triosseum is present.
11) V-shaped furcula (wishbone) is formed by the union of clavicles with interclavicles.
12) Distal carpals and metacarpals are fused to form carpo-metacarpus.

4. Write short notes on Archaeopteryx.

Ans. *Archaeopteryx lithographica* (Lizard bird) belongs to subclass Archaeornithes. Archaeopteryx means ancient wing.

The fossil Archaeopteryx lithographica was obtained from upper Jurassic rocks of Bavaria (Germany). It shows reptilian and avian characters. It forms a connecting link between reptiles and birds.

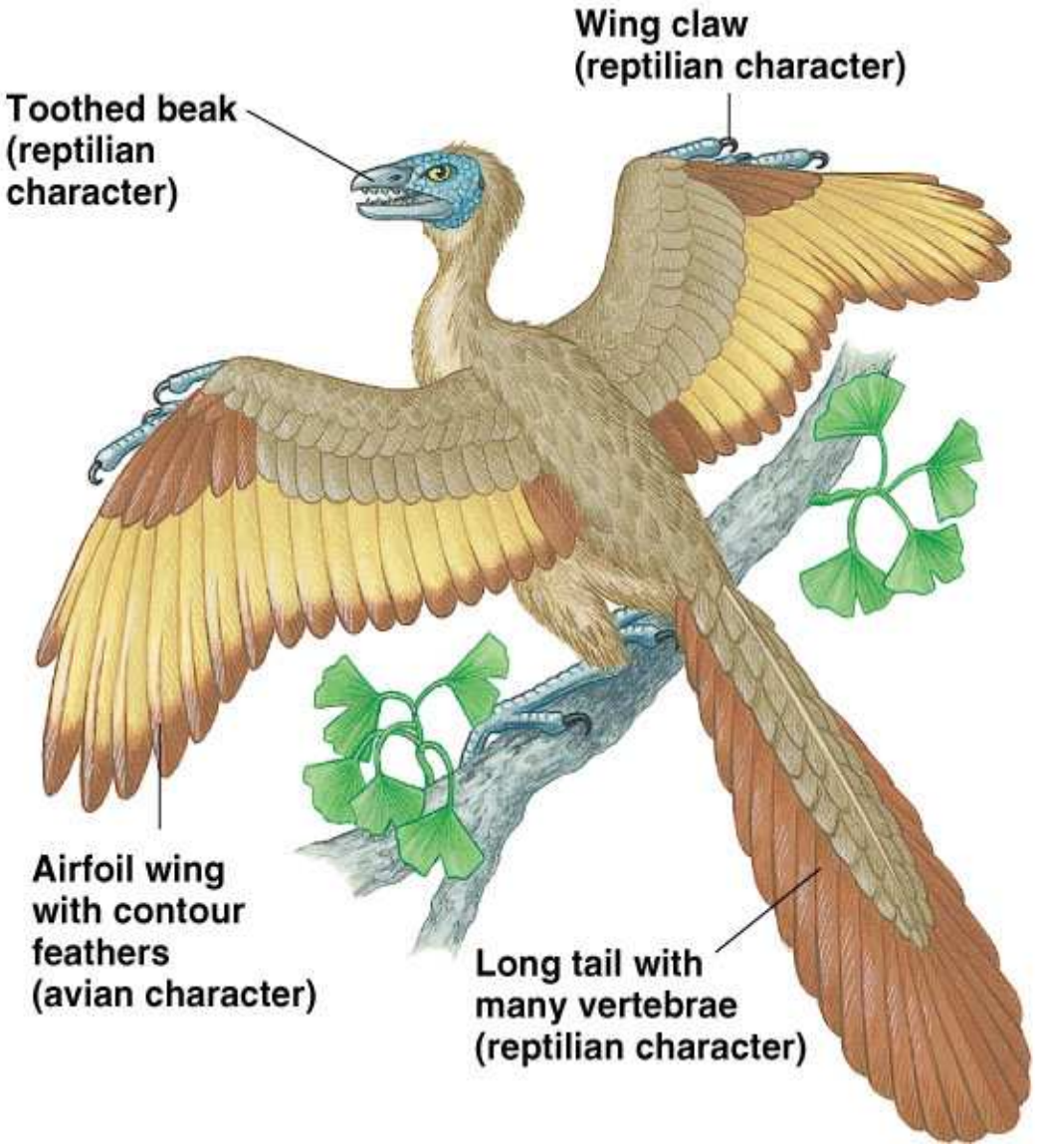
Reptilian characters in Archaeopteryx are

i) The bones are solid without air spaces (Non-pneumatic).

iii) Both the jaws possess thecodont teeth.
iv) Sternum was without keel.
v) Absence of pygostyle in the tail part.
vi) The brain is reptilian type.
vii) Amphicoelous type of vertebrae.
viii) Presence of Gastralia (abdominal ribs)
ix) Free carpals and metacarpals

Avian feathers Archaeopteryx:

i) Body is covered by feathers.
ii) Long tail with rows of feathers on the sides.
iii) Jaws are modified into beak.
iv) Forelimbs are modified into wings.
v) Large brain case
vi) Fusion of many bones.



5. Mention differences between Archaeornithes and Neornithes.

Ans.

Archaeornithes	**Neornithes**
1. Extinct Jurassic birds of Mesozoic age.	1. Living as well as extinct birds.
2. Long tail.	2. Tail is usually short, ends in a pygostyle.
3. Vertebrae are amphicoelous.	3. Vertebrae are heterocoelous.
4. Each wing had three clawed digits.	4. Claws are absent in fore-limb.
5. Abdominal ribs (gastralia) were present.	5. Abdominal ribs are absent.
6. Ribs had no uncinate process.	6. Thoracic ribs bear uncinate process.

7. Metacarpals and carpals were free.	7. Metacarpals and carpals are fused.

6. Mention the differences between Palaeognathae and Neognathae.?

Ans.

Palaeognathae	**Neognathae**
1. flightless birds are present	1. These are usually small, flying modern birds.
2. Wings are reduced	2. Wings are well developed.
3. Feathers are without interlocking mechanism.	3. Feathers are with inter locking mechanism.
4. Retcrices are absent or irregularly arranged.	4. Retrices are regularly arranged.
5. Preen gland is usually absent.	5. Preen gland is usually present.
6. Pygostyle is rudimentary or absent.	6. Pygostyle is present.
7. Syrinx is absent.	7. Syrinx is present.
8. Young ones are precocial.	8. Young ones are altrical.
9. Sternum is raft-like, without Keel (except in tinamous)	9. Sternum has keel or carina
10. exhibit discontinuous distribution	10. worldwide in distribution.

7. Mention the features of the birds of Palaeoganathae?

Bird	**Location**	**character**
1.Struthio (ostrich)	Africa	Fastest running bird
2.Rhea	South America	
3.Dromaius (emu)	Australia	Aftershaft is long as the mainshaft
4.Casuarius(cassowary)	Australia, New Guinea	Aftershaft is long as the main shaft
5.Apteryx haasti (Kiwi)	New Zealand	Smallest ratitiae; hair-like feathers without aftershaft. Without pecten; developed olfactory sense.
6. Tinamus (tinamou)	South Mexico, Central and South America	Presence of preen gland. Sternum with keel



Struthio



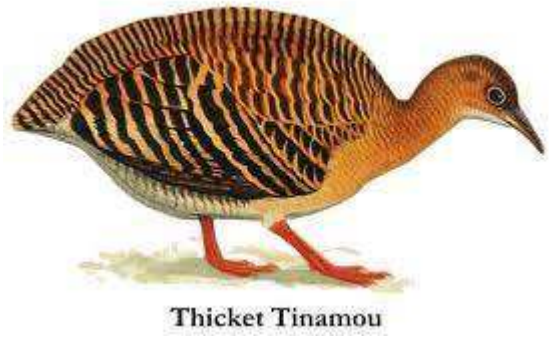
Rhea



Emu



kiwi



Thicket Tinamou

Mammalia

Very Short Answer Questions

1. Mention the functions of sebaceous glands and sudoriferous glands.

Ans. A) Sebaceous glands secrete the oil substance called sebum, which lubricates hair and skin.
B) Sudoriferous glands (sweat) maintain thermoregulation and excretion of excess of water by sweat.

2. Name the type of vertebrae in mammals. What is the typical number of cervical vertebrae in mammals?

Ans. Acoelous (amphiplatyan) vertebrae are present in mammals.
Most mammals have 7 cervical vertebrae.
But two-toed sloth,Manatee (Trichechus) has 6 cervical verterbrae
Three-toed sloth has 9 cervical vertebrae.

3. What is secondary palate in mammals? What is its functional significance?

Ans. Palatine processes of pre-maxilla, maxilla and palatine bones form a complete secondary palate in mammals.
It separates buccal cavity into nasal passage and oral passage.

4. Name the meninges in mammals.

Ans. In mammals three meninges are present.
They are outer duramater, middle arachnoid mater and inner piamater.

5. What is corpus callosum? Which group of mammals is characterized by it?

Ans. Two cerebral hemispheres of brain are connected by transverse band of nerve fibres called corpus callosum.
Eutherian group of mammals are characterized the corpus callosum.

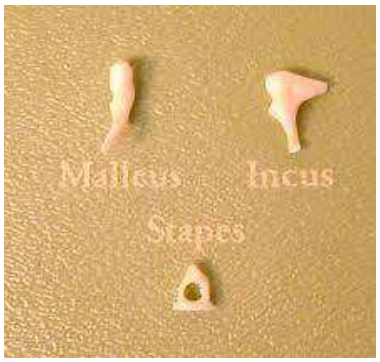
6. What are corpora quadrigemina?

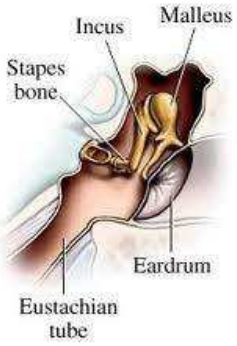
Ans. Four optic lobes constitute the corpora quadrigemina in the brain of mammals.

7. Name the three ear ossicles in mammals. By the modification of which bones of reptiles are they formed?

Ans. In mammals, middle ear has three ear ossicles, malleus, incus and stapes.
They are formed by the modifications of following bones.

a)Malleus -- formed by Articular bone
b)Incus -- formed by Quadrate bone
c) Stapes --- formed by hyomandibula bone







8. Name the smallest bone in mammals. It is the modification of which bone of lower reptiles?

Ans. Stapes is the smallest bone present in the middle ear of mammals.
It is modified by hyomandibular bone of lower reptiles.

9. Name the subclass of Mammalia in which testes are enclosed in scrotal sacs. How is it useful to them?

Ans. Testes are extra-abdominal and placed in scrotal sacs in Metatherians and Eutherian mammals. Advantage of the presence of testes outside the body is to avoid high temperature in body which many affect the production of sperms.

10. Based on which character did monotremata get that name?

Ans. In Prototherians, rectum and urinogenital sinus open into common cloaca. Hence they got the name Monotremata.

11. Name the type of ribs present in prototherians. How do they differ from those of therians?

Ans. Single-headed ribs are present in prototherians with capitulum only but without tuberculum.
Double-headed ribs are present in therians. They have both capitulum and tuberculum

12. Name the "Land of marsupials". Name any one marsupial distributed in America.

Ans. Australia is the "Land of marsupials".
Caenolestes (opossum rat) distributed in South America.

13. Give the standard dental formulae of metatherians and eutherians.?

Ans. I 5/4, c 1/1, pm 3/3, m 4/4 is the standard dental formula of metatherians.
I 3/3, c 1/1, pm 4/4, m 3/3 is the standard dental formula of eutherians.

14. Write two differences between the pectoral girdle of prototherians and therians.?

Ans. The pectoral girdle coracoid is well developed in prototherians and in therians, the coracoid is reduced.

15. Which type of placenta is present in eutherians? Name a marsupial having this type of placenta.

Ans. In eutherians chorioallantoic placenta is present.

Perameles (bandicoot) marsupial having the chorioallantoic placenta and choriovitelline placenta.

16. How do the newborn young ones of metatherians differ from those of eutherians?

Ans. Marsupial pouch is present in metatherians. Immature young ones crawl into marsupium, attach to teats and suckle (fed with the milk of the mother).

17. Name the mammal with shortest gestation period and the mammals with longest gestation period.

Ans. *Opossum (Didelphys*) is a marsupial with shortest gestation period of 12-14 days.

Longest gestatin period is present in elephant (24 months).

18. Name the largest mammal. To which order does it belong?

Ans. Blue whale (*Balaenoptera musculus*) is the largest mammal.
It belongs to the order Cetacea.

<u>Short Answer Questions</u>

1. Give general characters of egg laying mammals.?

Ans. Characters of egg laying mammals belong to subclass Prototheria.

1) Pinna (External ear) is absent.
2) Teeth are present in young stages only (juvenile)
3) Pectoral girdle has interclavicle.
4) Ribs are single headed with capitulum only. Tuberculum absent
5) Epipubic bones arise from pelvis.
6) Mammary glands without nipples.
7) Absence of Corpus callosum
8) Testes are abdominal.
9) Cloaca present. Rectum and urinogenital sinus opens into cloaca.
   So these are named as Monotremata because of single opening.
10) Two uteri open into urinogenital sinus.
11) Eggs are large, megalecithal with more amount of yolk.
12) Meroblastic cleavage.

E.g., a)*Ornithorhynchus anatinus* (duck-billed platypus) –
Female has nest to deposit the eggs.
Male platypus has a grooved erectile poison spine on tarsus.



b)*Tachyglossus aculeatus* (short nosed echidna) – deposit eggs in temporary abdominal pouch

c)*Zaaglossus bruijni* ---- long-nosed echidna.





2. Mention the general characters of Metatheria.

Ans. Metatherians belong to single order, Marsupialia. They show the following features…

1) Females have a Marsupial pouch .Immature young ones carwl into the marsupium and attach to teats and suckle.
2) Pelvic girdle has epipubic bones.
3) Typical marsupial dental formula is i 5/4, c 1/1, pm 3/3, m 4/4.
4) The anal and urinogenital openings are closely appositioned and are operated by a common sphincter.
5) Penis is behind scrotum. Glans penis is forked.
6) Uteri and vaginae are double.
7) Most of them have choriovitelline placenta only. But *Perameles* has chorioallantoic placenta also.
8) The period of gestation is shorter that that of oestrous cycle. It is 12-14 days in *Opossum.*
11) Australia is describe as 'Land of Marsupials'.

E.g., a) *Macropus* (kangaroo) b)*Didelphis* (Opossum)
c)*Caenolestes* (opossum rat) d)*Perameles* (marsupial bandicoot)
e)Thylacinus (Tasmanina wolf) f)*Myrmecobius* (banded anteater)
g)*Phascolarctos* (koala bear)






3. Explain, how the marsupials form an intermediate group between prototheria and Euteria.?

Ans. Marsupials are the pouched mammals.

- Coracoids are indistinct in marsupials; while thery are well developed in prototherians and totally absent in eutherirans.
- Anus and urinogenital aperture are closely appositioned and are operated by a common sphincter in marsupials. But they open into common cloaca in porototherians; Eutherains have space between them.
- Marsupials give birth to immature young ones. While prototherians are oviparous and metatherians are viviparous (mature).
- Corpus callosum indistinct in marsupials, absent in prototheria, present in Eutheria.

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4. Mention the differences between Metatheria and Eutheria.?

Ans.

Metatheria	**Eutheria**
1. Female has marsupial pouch.	1. Placental mammals.
2. Epipubic bones are present in pelvic girdle.	2. Epipubic bones are absent.
3. Marsupials replace only the last premolars.	3. Eutherians replace their teeth except molars.
4. Anus and urinogenital aperture are closely appositioned and controlled by a sphincter.	4. Anus and urinogenital openings are separated by space called perineum.
5. Uteri and vaginae are double.	5. Uterus is double or single.

6. Shortest gestation period in opossum 12-14 days.	6. Longest gestation period in Elephant.
7. The embryos are born very young.	7. Young ones are born.
8. Glans penis is forked in most marsupials.Penis behind the scrotum	8. Penis is in front of scrotum.