# AMNIOTA

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Reptiles, Aves and Mammals represent three classes of Tetrapoda constituting together a group of vertebrates known as Amniota.

Amniotes have certain common characters which make them different from all other vertebrates.

#### **CHARACTERISTICS OF AMNIOTA:-**

I- The embryo of reptiles, birds and mammals develops inside the egg or uterus of mother, surrounded and protected by certain membranes known as extra embryonic membranes. One of these membranes, is known as amnion.

The embryo develops inside an amniotic fluid and surrounded by an amniotic membrane. Thus the reptiles, birds and mammals are designated as amniotes. •2- Presence of a neck region separating head from the trunk.

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•4- The embryo develops inside an egg or uterus of mother, and hatches or is delivered usually in a well developed state. The heart is composed of two atria and two ventricles. Conus or truncus arteriosus is absent.

●6- The adult kidney is of the metanephric type.

### GENERAL CHARACTERS OF CLASS REPTILIA

 1- Many reptiles live in deserts with severe climatic conditions. Thus, their skin is protected by overlapping horny scales for retention of water.
In addition, the skin is usually devoid of glands and known as dry skin.

•2- There are two pairs of pentadactyl limbs.

•3- Respiration is always by lungs .

•4-Reptiles are cold-blooded animal ( poikilothemous ) the body temperature varies with that of the environment.

 5- There are a single occipital condyle at the posterior portion of the skull •6-The red blood cells are oval and nucleated.

 7- Fertilization is internal and the eggs are laid on land protected by calcareous shells (oviparous).
Or vivioviparous as in Lizard .

●8- The kidneys are metanephric .

#### **CHARACTERS OF CLASS AVES:**

I- Feathers cover the body as the main exoskeleton

 2- Presence of a beak, formed of horny layer covering bony anterior extensions of premaxillae from the skull and dentaries from lower jaw.

3- Absence of teeth, being compensated by the beak

•4- Bones are light and thin, and the skeletal elements are mostly fused together without sutures, and some of them are thin and rod-like. Such features cause lightness of the body for the purpose of flight.

 5- The sacral vertebrae are fused with the lumbar and with some posterior thoracic and anterior caudal vertebrae, to form a synsacrum for the support of the ilia, posterior caudal vertebrae are usually fused to form a pygostyle, around which the tail feathers are arranged. •6-Distal carpals and the metacarpals are fused into a carpometacarpus. The proximal tarsal are also fused with the tibia forming a tibio-tarsus, and the distal tarsals fuse with the 2 nd, 3 rd. and 4 th. metatarsals forming a tarso- metatarsus. The first metatarsal is free. The fifth digit is generally absent

 Orelimbs are bipedal vertebrates, the forelimbs being modified into wings retaining the pentadactyl limb pattern. •8-The sternum is broad, boat-like and protects the general viscera.

9-Presence of a median strong vertical bone or keel (carina) extending from the sternum, among the flying birds or carinate birds.

The carina forms, with the sternum, a wide concavity inside which fit the powerful pectoral muscles (major and minor) for the purpose of flight

 10-The alimentary canal is characterized by certain features, as the presence of crop at the end of esophagus for maceration of grains and the thick walled muscular gizzard as the main part of the stomach for grinding the grains aided by stones which are always existing there.

 11- presence of a voice organ or syrinx at the junction of the trachea with the bronchi. 12- The left ovary only is present; the right being absent with the right oviduct.

 13- An elaborate respiratory system enabling a more complete absorption of oxygen and the production of a higher constant temperature.  14- Heart is four- chambered, and the two ventricles are completely separate from one another.

●15- Ear has a large curved cochlea.

I6-Kidney is three-lobed and metanephros, urinary bladder is absent.

#### CHARACTERISTICS OF CLASS MAMMALIA

- I- presence of mammary or milk glands secreting milk for nourishment of the young, and thus the name mammalia.
- 2- Presence of hair covering the whole body, parts of it, or at least the body of the embryo. Hair are not found in any other class of vertebrates.
- 3- Mammals are homoiothermous vertebrates, or warm blooded, regulating their body temperature.

•4- Presence of diaphragm, a muscular septum separating the thoracic cavity enclosing the heart and lungs, from the abdominal cavity containing the general viscera.

•5- Heart is four chambered, and the ventricles are completely separate from one another. The right aortic arch is absent and the left is present. Renal portal circulation is totally absent, meaning that the venous blood from the tail and hind regions of the body does not enter the kidneys, but goes directly to the heart. Red blood corpuscles are circular, biconcave and non - nucleated, except in camel

•6- kidneys are bean-shaped, metanephric and highly efficient containing a great number of renal corpuscles. •7- presence of penis in the male, and the testes descended from the abdominal cavity during development, to lie externally inside scrotal sacs. In the female, there is the vulva and clitoris.

 8- Skull is evolved from a synapsid type ,Lower jaw is formed of single dentary which articulates with the squamosal of the cranium. 9- The teeth are heterodont (incisors, canines, molars); The codont and diphydont.

- 10-Brain is complicated, and the cerebrum is well developed and extended into convolutions in higher mammals. Optic lobes are four, known as corpora quadri gemina.
- Mammals possess an elaborate nervous system. It is the most efficient among all vertebrates, with a definition between sympathetic and parasympathetic nervous system.