

Fig - Digestive system in birds

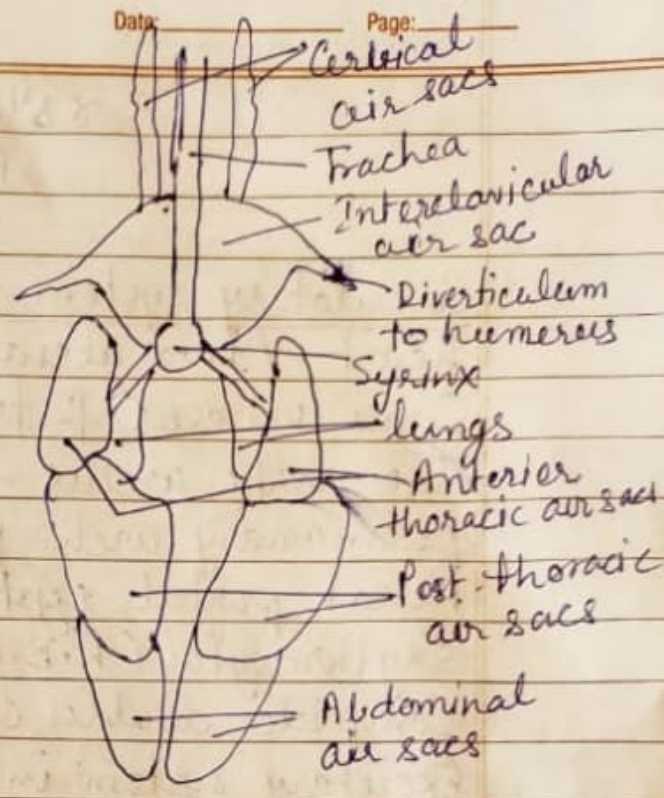


Fig - Respiratory system in birds (Aves)

Respiratory system in birds - lungs - spongy, alveoli absent. Nine air sacs present - unpaired interclavicular, paired cervical, ant-thoracic, post-thoracic & abdominal. Fresh air always moving inside. Trachea large and coiled. Syrinx at the junction of trachea & bronchi. It is sound producing organ. Birds have a system of branching air sacs that function with their lungs in respiration. This system supplies the high level of  $O_2$  needed to support a high rate of metabolism for the hard working flight muscles. This high metabolic activity also provide heat for endotherm.

Circulatory system in birds - Four chambered heart - two atria & two ventricle

Sinus venosus & truncus arteriosus absent.

Two aortic arches - right systemic arch & pulmonary arch present.

Renal portal system reduced

Erythrocytes (-R.B.C) oval & nucleated.

Complete double circulation.

Excretory system in birds - Metanephric kidney three lobed. Urinary bladder absent

except in Ostrich. Uricotelic animals.

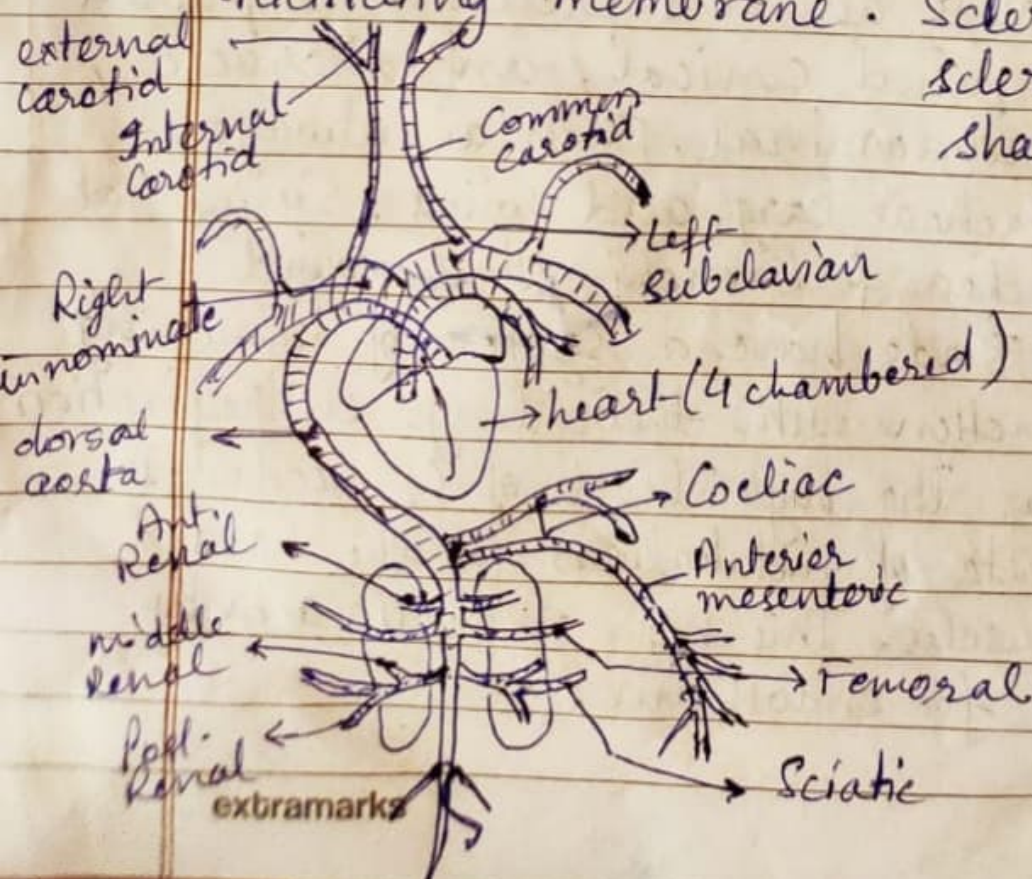
(excretes uric acid)

Nervous system - Two meninges - Dura mater & Pia - arachnoid membrane

Cerebral hemisphere, optic lobes, Cerebellum are large. Cranial nerves - 12 pairs

Sense organs - Eyes large - possesses

nictitating membrane. Sclerotic plates in sclerotic layer - maintain shape of the eye.



← Fig Avian Circulatory System

Comb shaped pecten - projects into vitreous humour probably nourishes, removes wastes

External ear openings present. Middle ear with single ossicles - Columella aeris, cochlea with organ of Corti in internal ear.

Olfactory sense is poor except in kiwi

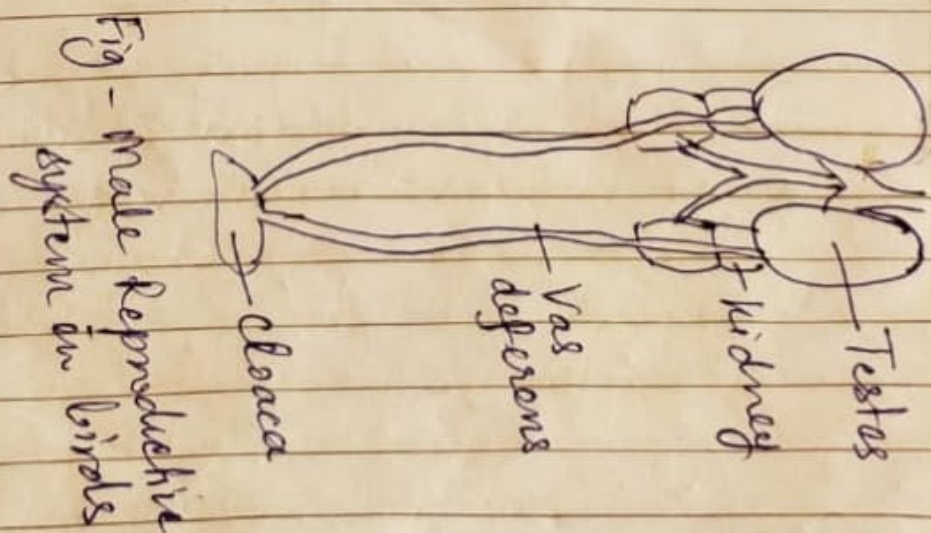
Vision - upto 8 times more than human vision

Each eye moves independently.

Reproductive System - Copulatory organs absent except in ducks, geese, swan, flightless birds

In female - right ovary and oviduct rudimentary. Fertilization internal. Oviparous, megalecithal and cleidoic eggs. Meroblastic cleavage

Four extra embryonic membranes - appear during development. In males - in species without a phallus, sperm is stored within the cloaca prior to copulation. Sperm is stored in cloaca of female after copulation from a week to a year. Then one by one eggs will descend from ovary and become fertilized. After being laid further development of egg takes place in bird's nest. Phallus is a copulatory organ present in some birds.



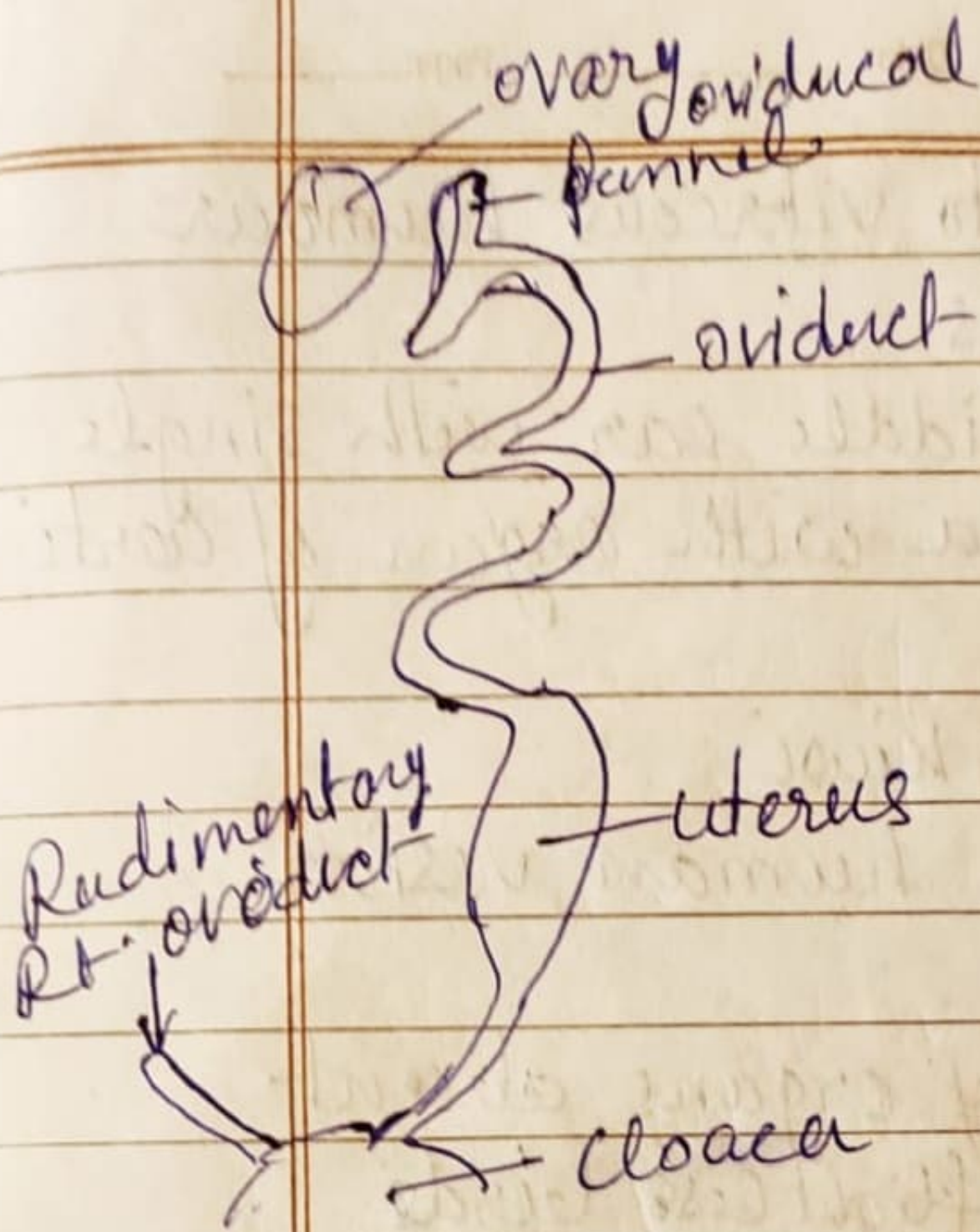


Fig - Female reproductive system in birds.