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MAMMALIAN OVARY

Structure and function of Mammalian ovary.

Introduction → Reproduction is one of the most essential properties of living organisms. Various forms of life are capable of reproducing themselves from one generation to next from different types. Some organisms reproduce asexually and others reproduce sexually. Human being reproduce sexually only and are viviparous.

The reproductive events in human include formation of gametes (gametogenesis) i.e. sperm in males and ovum in females, insemination, fertilization, implantation, gestation and parturition.

Ovary word is derived from a Latin word ovum meaning egg and it is a part of female reproductive system. It produces eggs, transport the eggs to the site of fertilization.

The female Reproductive system :- A female reproductive system consists of

① a pair of ovaries along with

② a pair of oviducts

③ uterus

④ cervix

⑤ vagina

⑥ The external genitalia located in pelvic region

Functions of female reproductive system :-

- ① Produces female egg cells
- ② Transport the eggs to the site of fertilization
- ③ The fertilization of an egg by a sperm occurs in fallopian tubes.
- ④ After fertilization, provides a place for a baby to develop.
- ⑤ If fertilization fails, the system is designed to menstruate.
- ⑥ Produces female sex hormones that maintain a reproductive cycle.

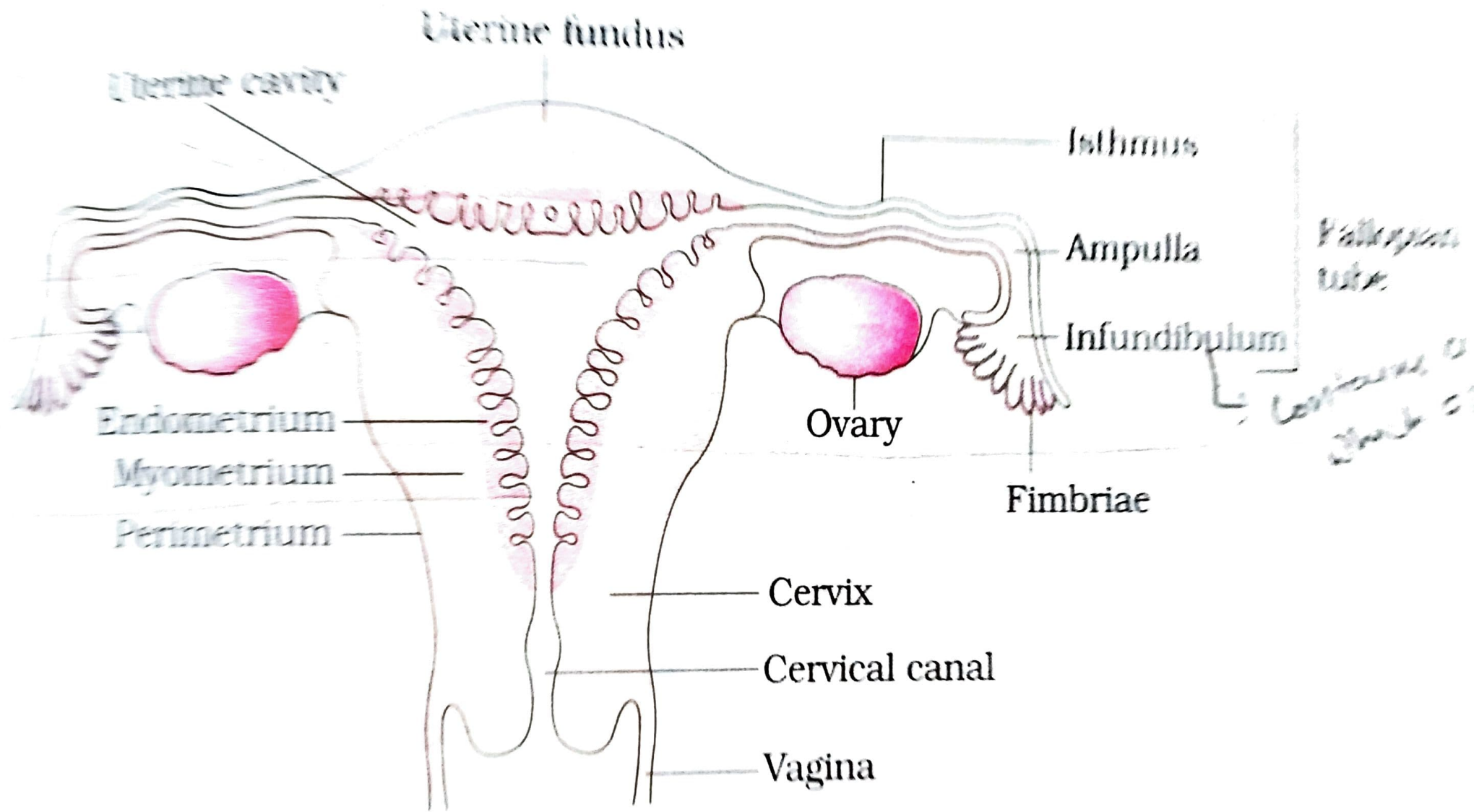


Figure 3.3 (b) Diagrammatic sectional view of the female reproductive system

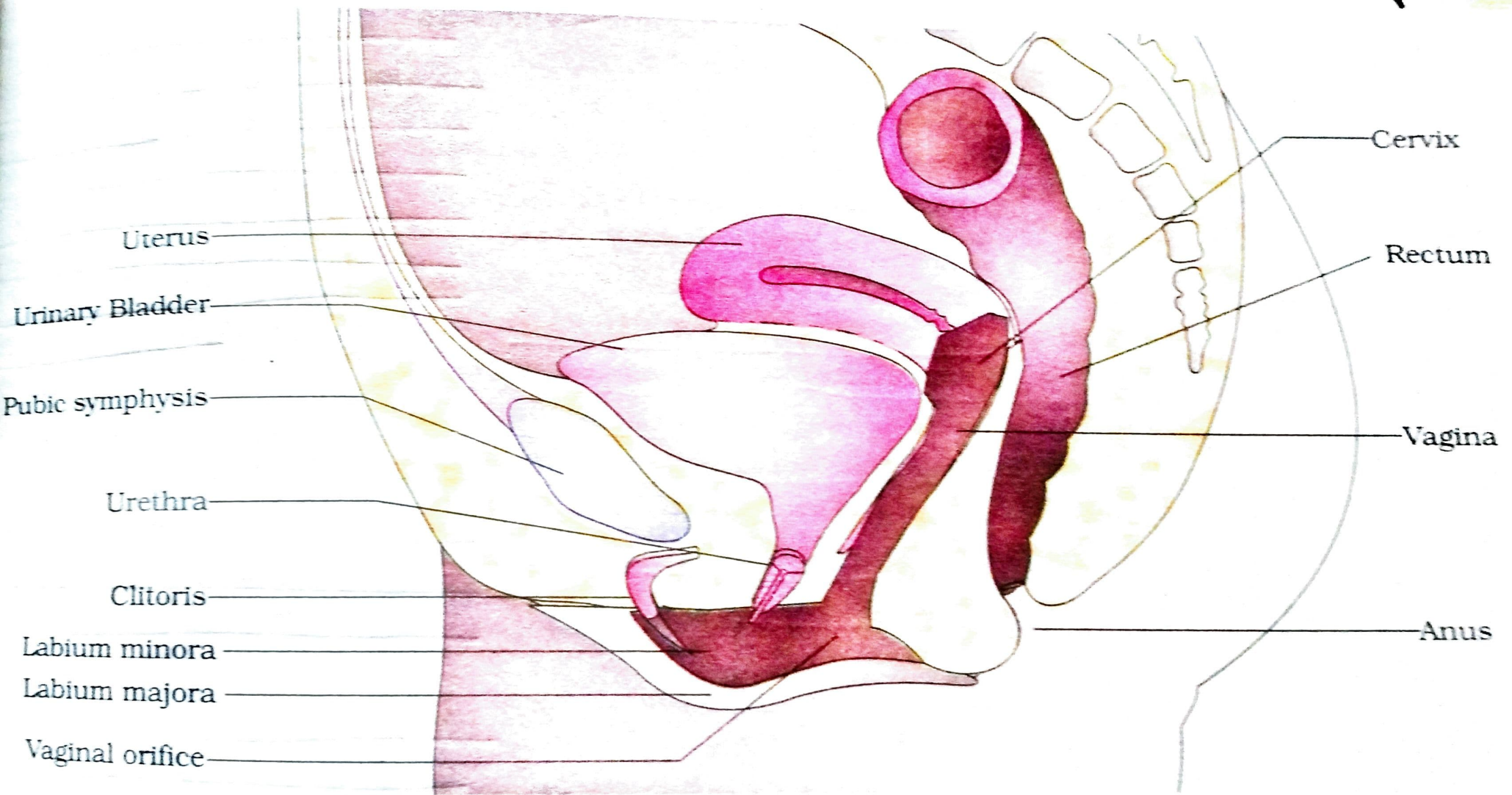


Figure 3.3 (a) Diagrammatic sectional view of female pelvis showing reproductive system

OVARIES :- ovaries are the primary female sex organs that produces the female gamete (ovum) and several steroid (ovarian) hormones. The ovaries are located one on each side of the lower abdomen. Each ovary is about 2 to 4 cm in length and is connected to pelvic wall and uterus by ligaments.

Each ovary is covered by a thin epithelium i.e. germinal epithelium which encloses the ovarian stroma. It is made up of connective tissues and divided into two zones a peripheral cortex and an inner medulla.

- ① Cortex :-
- ① Contains ovarian follicles consists of oocytes at various later stages of development.
 - ② Single layer of follicular cells.
 - ③ Several layers of granulosa cells.
- ② Medulla :- is of loose connective tissues, blood vessels and nerves.

Mature or Graafian follicles is a large fluid filled follicle that will rupture and release a sec. oocyte in process called ovulation.

Corpus luteum is the remnant of a ruptured follicle - produces oestrogen, progesterone and relaxin until degenerates into corpus albicans.

Functions :-

At puberty, the ovary begins to secrete increasing levels of hormones. Secondary sex organs begin to develop in response to the hormones. The ovary changes structure and function beginning at puberty. A variety of feed back mechanism stimulate the endocrine system which cause hormone secretion from ovaries. These feed back mechanism is controlled by hypothalamus and pituitary gland. Messages from hypothalamus are sent to the pituitary gland. In turn pituitary gland release hormones to ovaries. From this signalling the ovaries release their own hormones.

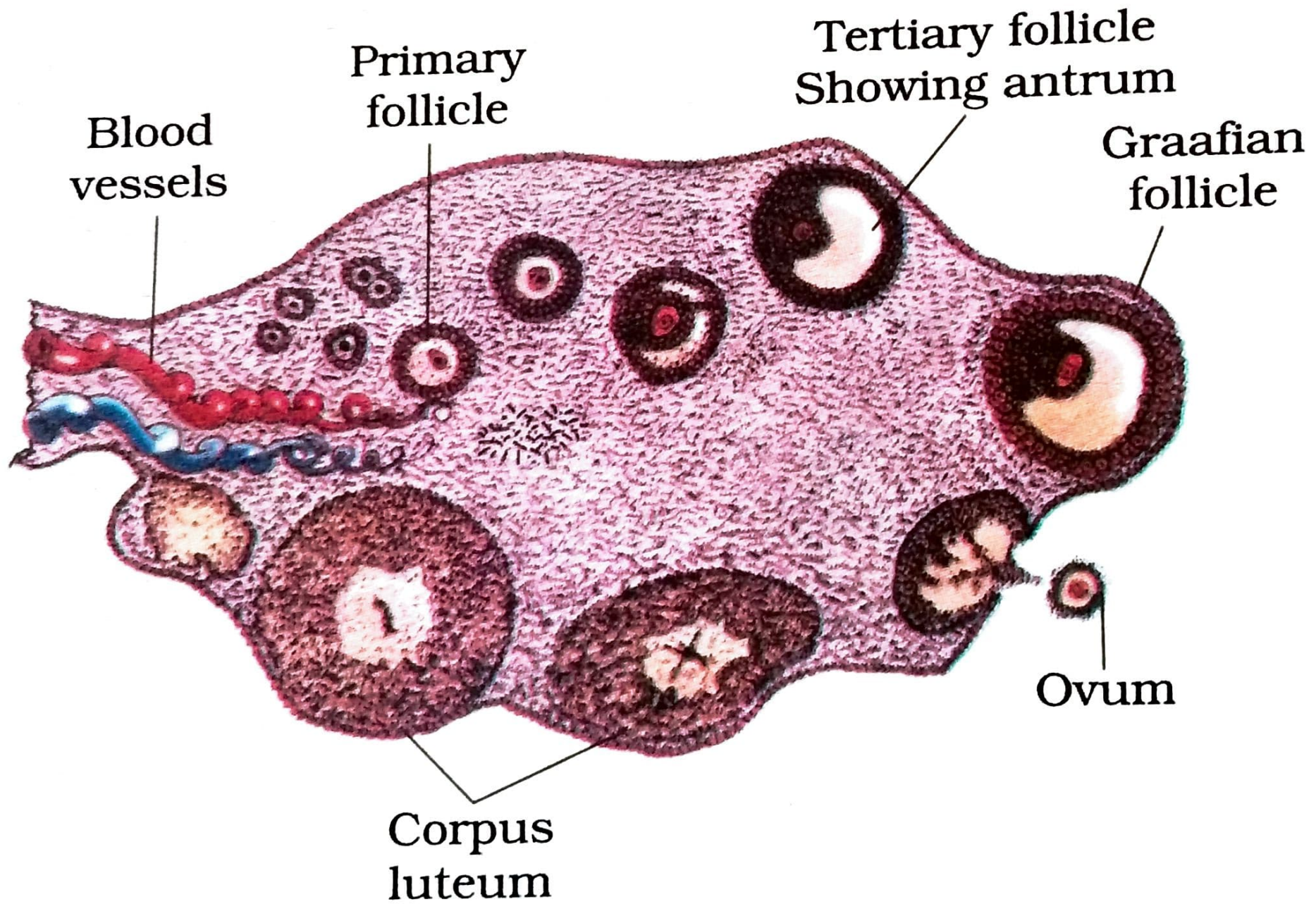


Figure 3.7 Diagrammatic Section view of ovary

① Gamete formation :- The Ovaries are the site of production and periodical release of egg cells, the female gamete. In the ovaries, the developing egg cells (or oocytes) mature in the fluid filled follicles. Typically only one oocyte develops at a time, but others can also mature simultaneously. Follicles are composed of different types and number of cells according to their stage of their maturation, and their size is indicative of the stage of oocyte development.

When a oocyte finishes its maturation in the ovary, a surge of luteinizing hormone secreted by the pituitary gland stimulates the release of the oocyte through the rupture of the follicle. This process is called Ovulation. The follicles remain functional & reorganizes into a corpus luteum, which secretes progesterone in order to prepare the uterus for an eventual implantation of the embryo.

② Hormone Section :- At maturity ovaries secrete estrogen, testosterone, inhibin and progesterone. In woman, fifty percent of testosterone is produced by the ovaries and adrenal glands and released directly into the blood stream. Estrogen is responsible for appearance of secondary sex characters for females at puberty and for the maturation and maintenance of the reproductive organs in their mature stage. Progesterone prepare the uterus for pregnancy and mammary gland for lactation. Progesterone functions with estrogen by promoting menstrual cycle changes in the endometrium.