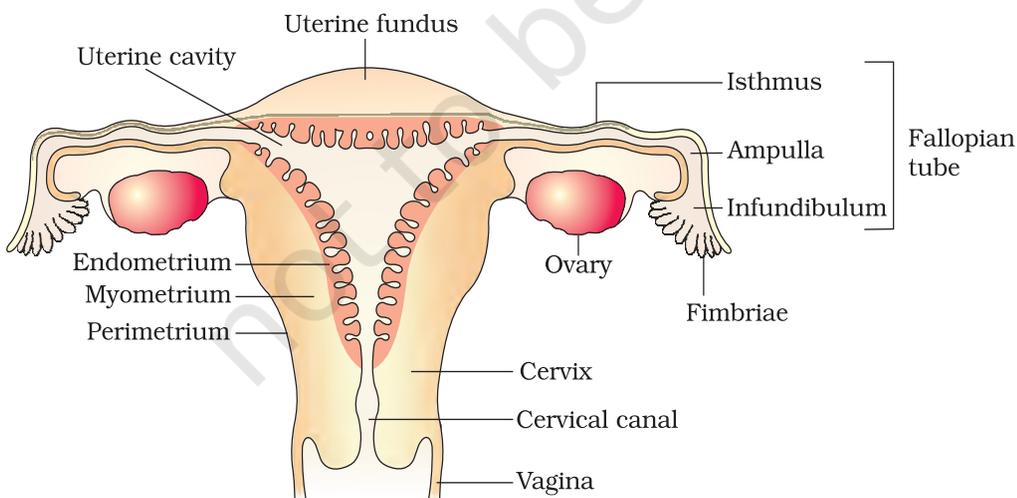


**Figure 3.3 (a)** Diagrammatic sectional view of female pelvis showing reproductive system

The oviducts (fallopian tubes), uterus and vagina constitute the female accessory ducts. Each fallopian tube is about 10-12 cm long and extends from the periphery of each ovary to the uterus (Figure 3.3b), the part closer to the ovary is the funnel-shaped **infundibulum**. The edges of the infundibulum possess finger-like projections called **fimbriae**, which help in collection of the ovum after ovulation. The infundibulum leads to a wider

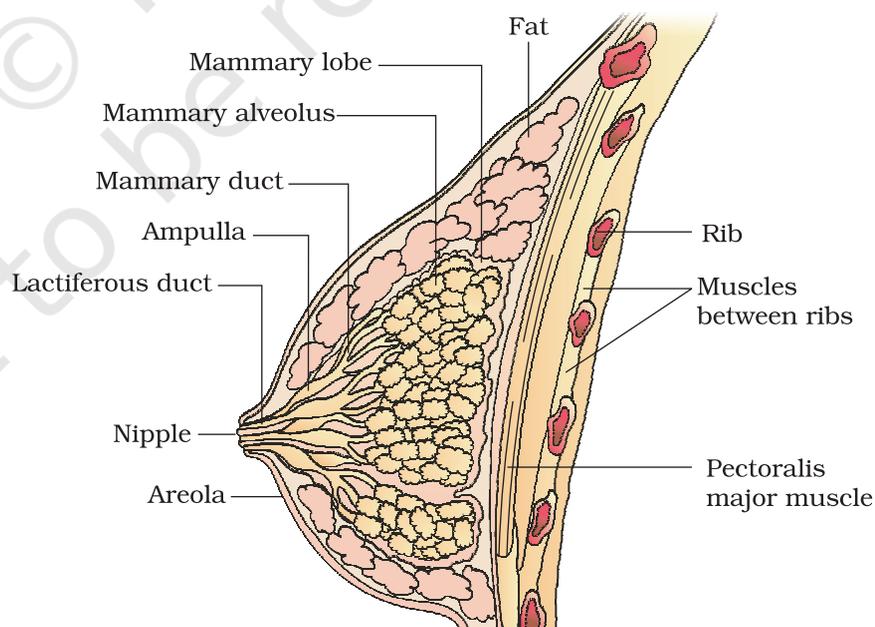


**Figure 3.3 (b)** Diagrammatic sectional view of the female reproductive system

part of the oviduct called **ampulla**. The last part of the oviduct, **isthmus** has a narrow lumen and it joins the uterus.

The uterus is single and it is also called **womb**. The shape of the uterus is like an inverted pear. It is supported by ligaments attached to the pelvic wall. The uterus opens into vagina through a narrow cervix. The cavity of the cervix is called **cervical canal** (Figure 3.3b) which alongwith vagina forms the birth canal. The wall of the uterus has three layers of tissue. The external thin membranous **perimetrium**, middle thick layer of smooth muscle, **myometrium** and inner glandular layer called **endometrium** that lines the uterine cavity. The endometrium undergoes cyclical changes during menstrual cycle while the myometrium exhibits strong contraction during delivery of the baby.

The female external genitalia include mons pubis, labia majora, labia minora, hymen and clitoris (Figure 3.3a). **Mons pubis** is a cushion of fatty tissue covered by skin and pubic hair. The **labia majora** are fleshy folds of tissue, which extend down from the mons pubis and surround the vaginal opening. The **labia minora** are paired folds of tissue under the labia majora. The opening of the vagina is often covered partially by a membrane called **hymen**. The **clitoris** is a tiny finger-like structure which lies at the upper junction of the two labia minora above the urethral opening. The hymen is often torn during the first coitus (intercourse). *However, it can also be broken by a sudden fall or jolt, insertion of a vaginal tampon, active participation in some sports like horseback riding, cycling, etc. In some women the hymen persists even after coitus. In fact, the presence or absence of hymen is not a reliable indicator of virginity or sexual experience.*



**Figure 3.4** A diagrammatic sectional view of Mammary gland

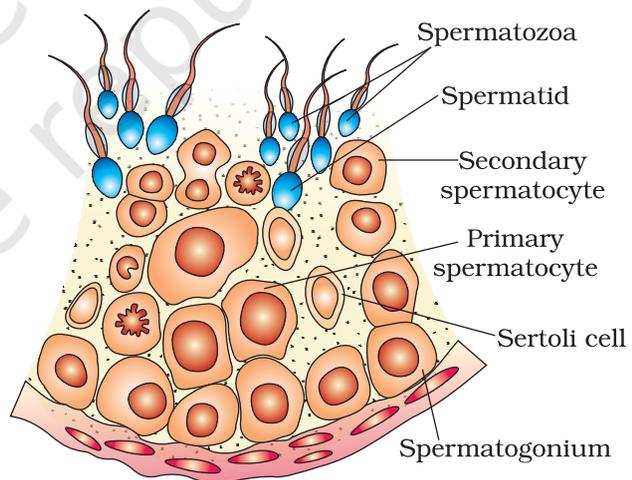


A functional mammary gland is characteristic of all female mammals. The mammary glands are paired structures (breasts) that contain glandular tissue and variable amount of fat. The glandular tissue of each breast is divided into 15-20 **mammary lobes** containing clusters of cells called alveoli (Figure 3.4). The cells of alveoli secrete milk, which is stored in the cavities (lumens) of alveoli. The alveoli open into mammary tubules. The tubules of each lobe join to form a **mammary duct**. Several mammary ducts join to form a wider mammary ampulla which is connected to **lactiferous duct** through which milk is sucked out.

### 3.3 GAMETOGENESIS

The primary sex organs – the testis in the males and the ovaries in the females – produce gametes, i.e. sperms and ovum, respectively, by the process called gametogenesis. In testis, the immature male germ cells (spermatogonia) produce sperms by **spermatogenesis** that begins at puberty. The **spermatogonia** (sing. spermatogonium) present on the inside wall of seminiferous tubules multiply by mitotic division and increase in numbers. Each spermatogonium is diploid and contains 46 chromosomes. Some of the spermatogonia called **primary spermatocytes** periodically undergo meiosis. A primary spermatocyte completes the first meiotic division (reduction division) leading to formation of two equal, haploid cells called **secondary spermatocytes**, which have only 23 chromosomes each. The secondary spermatocytes undergo the second meiotic division to produce four equal, haploid **spermatids** (Figure 3.5). *What would be the number of chromosome in the spermatids?* The spermatids are transformed into **spermatozoa (sperms)** by the process called **spermiogenesis**. After spermiogenesis, sperm heads become embedded in the **Sertoli cells**, and are finally released from the seminiferous tubules by the process called **spermiation**.

Spermatogenesis starts at the age of puberty due to significant increase in the secretion of gonadotropin releasing hormone (GnRH). This, if you recall, is a hypothalamic hormone. The increased levels of GnRH then acts at the anterior pituitary gland and stimulates secretion of two gonadotropins – luteinising hormone (LH) and follicle stimulating hormone (FSH). LH acts at the Leydig cells and stimulates synthesis and secretion of androgens. Androgens, in turn, stimulate the process of spermatogenesis. FSH acts on the Sertoli cells and stimulates



**Figure 3.5** Diagrammatic sectional view of a seminiferous tubule (enlarged)