

Chapter.3
Human Reproduction
Class – XII
Subject –Biology

1. Fill in the blanks:

- a) Humans reproduce _____. (asexually/sexually)
- b) Human's are _____. Oviparous/viviparous/ovoviviparous)
- c) Fertilization is _____ in humans. (external/internal)
- d) Male and female gametes are _____. (Diploid/haploid)
- e) Zygote is _____. (Diploid/haploid)
- f) The process of release of the ovum from a mature follicle is called_____.
- g) Ovulation is induced by a hormone called_____
- h) The fusion of the male and the female gametes is called _____.
- i) Fertilization takes place in the _____.
- j) The zygote divides to form _____, which is implanted in uterus.
- k) The structure which provides vascular connection between the foetus and uterus is called _____.

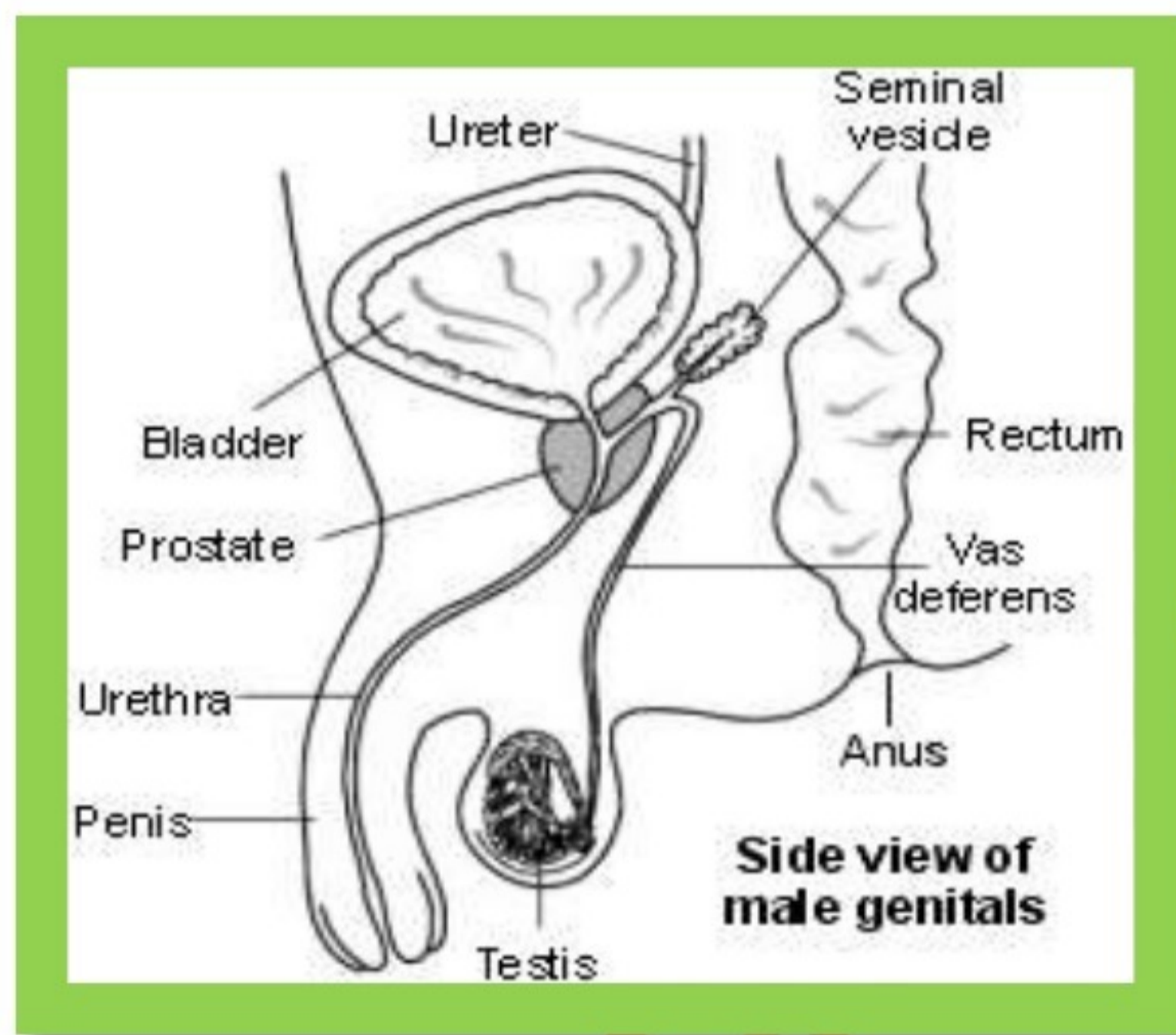
Answer 1.

- a) Sexually
- b) Viviparous
- c) Internal
- d) Haploid
- e) Diploid
- f) ovulation
- g) estrogens
- h) fertilisation
- i) ampullary-isthmic junction

- j) blastomers
- k) placenta

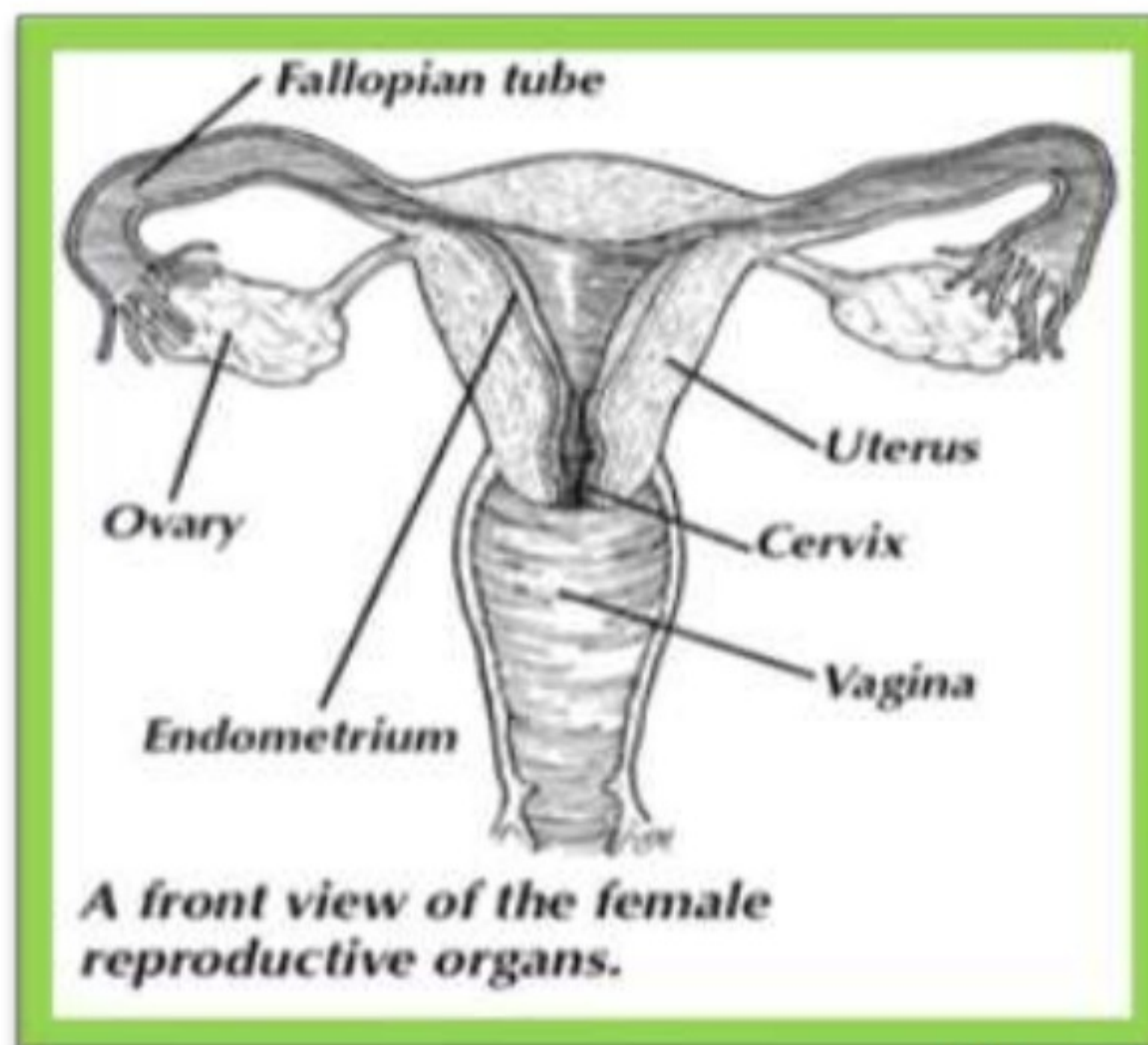
2. Draw a labelled diagram of male reproductive system.

Answer 2.



3. Draw a labelled diagram of female reproductive system.

Answer 3.



4. Write two major functions each of testis and ovary.

Answer.4

Two major functions of testis are:

- a) It produces sperms.
- b) It provides nutrition to germ cells and secretes androgens.

Two major functions of ovary are:

- a) It produces collection of steroid hormones also termed ovarian hormones.
- b) Produces female gametes called ovum.

5. Describe the structure of a seminiferous tubule.

Answer 5.

Seminiferous tubules are lined by two types of cells, spermatogonia and sertoli cells from inside. Spermatogonia cells form sperms through mitotic division, while nutrition to germ cells is provided by sertoli cells. The regions outside the seminiferous tubules called interstitial spaces which contain small blood vessels and Leydig cells, androgens are secreted from Leydig cells.

6. What is spermatogenesis? Briefly describe the process of spermatogenesis.

Answer 6.

As the puberty starts, sperms are produced by immature male germ cells through spermatogenesis in testis. Spermatogenesis is a process in which undifferentiated diploid germ cells produce and differentiate the haploid cells in animals producing sexually.

Through mitotic division, spermatogonia increase its number. Each spermatogonia is diploid and have 46 chromosomes. Then the spermatogonia which are called primary spermatocytes. One primary spermatocyte divides meiotically and produces haploid cells, which are called secondary spermatocytes. Secondary spermatocytes undergo second meiotic division to produce four haploid spermocytes. Through the process of spermiogenesis, the formed spermatids are transformed into spermatozoa. After spermiogenesis sperm heads become embedded in the sertoli cells, and are finally released from the seminiferous tubules by the process called spermiation.

7. Name the hormones involved in regulation of spermatogenesis.

Answer 7.

The increased level of GnRH acts as the anterior pituitary gland and stimulates secretion of two gonadotropins – luteinising hormone (LH) and follicle stimulating hormone (FSH). LH acts at leydig cells and stimulates synthesis and secretion of androgens. On the other hand, androgens stimulate the process of spermatogenesis.

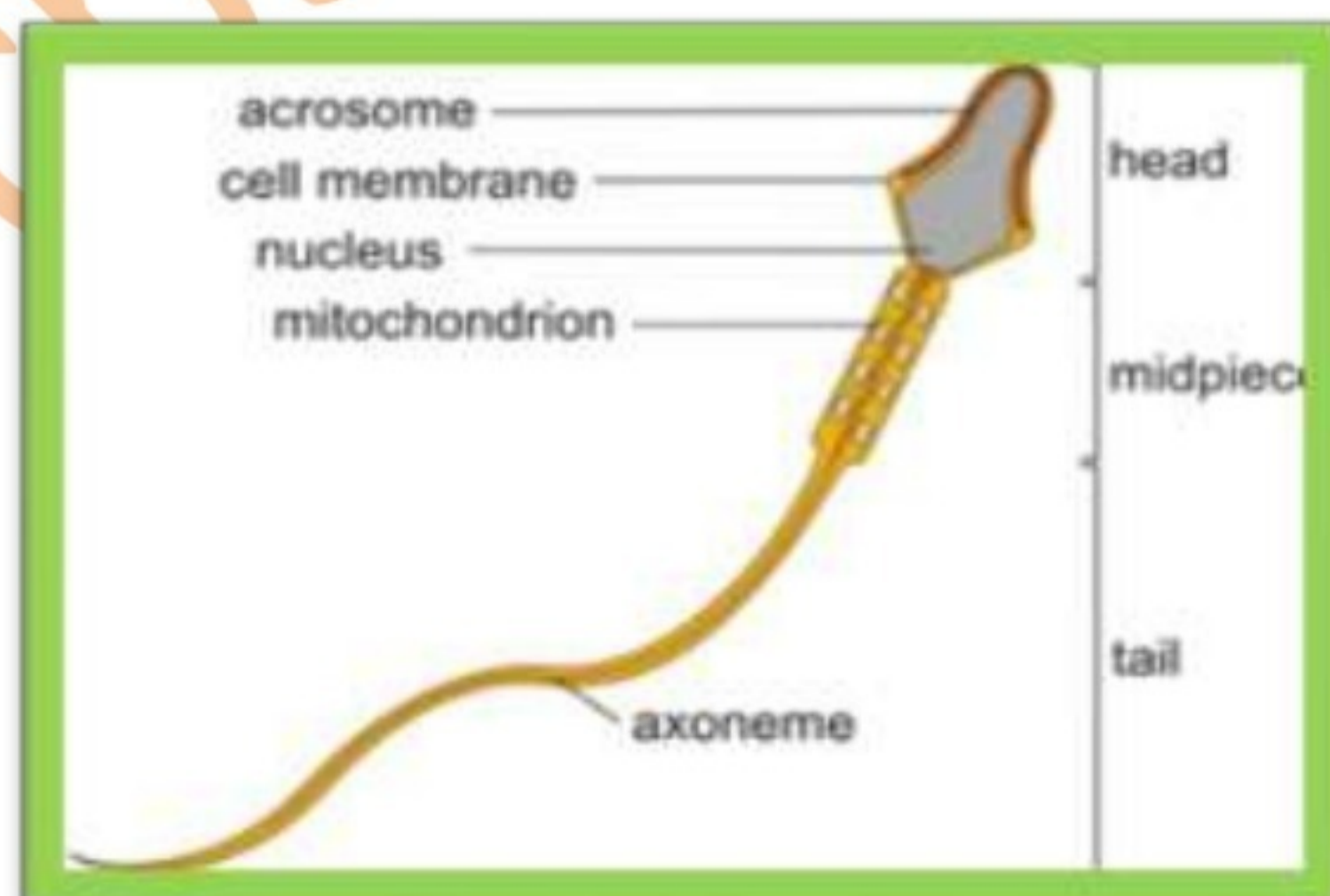
8. Define spermiogenesis and spermiation.

Answer 8.

The transfer of spermatids into sperms is called spermiation. After spermiogenesis, sperm heads become embedded in sertoli cells and are finally released from the seminiferous tubules by the process called spermiation.

9. Draw a labelled diagram of sperm.

Answer.9



10. What are the major components of seminal plasma?

Answer.10

Fructose, calcium and certain enzymes are the main components of seminal plasma.

11. What are the major functions of male accessory ducts and glands?

Answer.11

They store and transport the semen into urethra from testis.

12. What is oogenesis? Give a brief account of oogenesis.

Answer.12

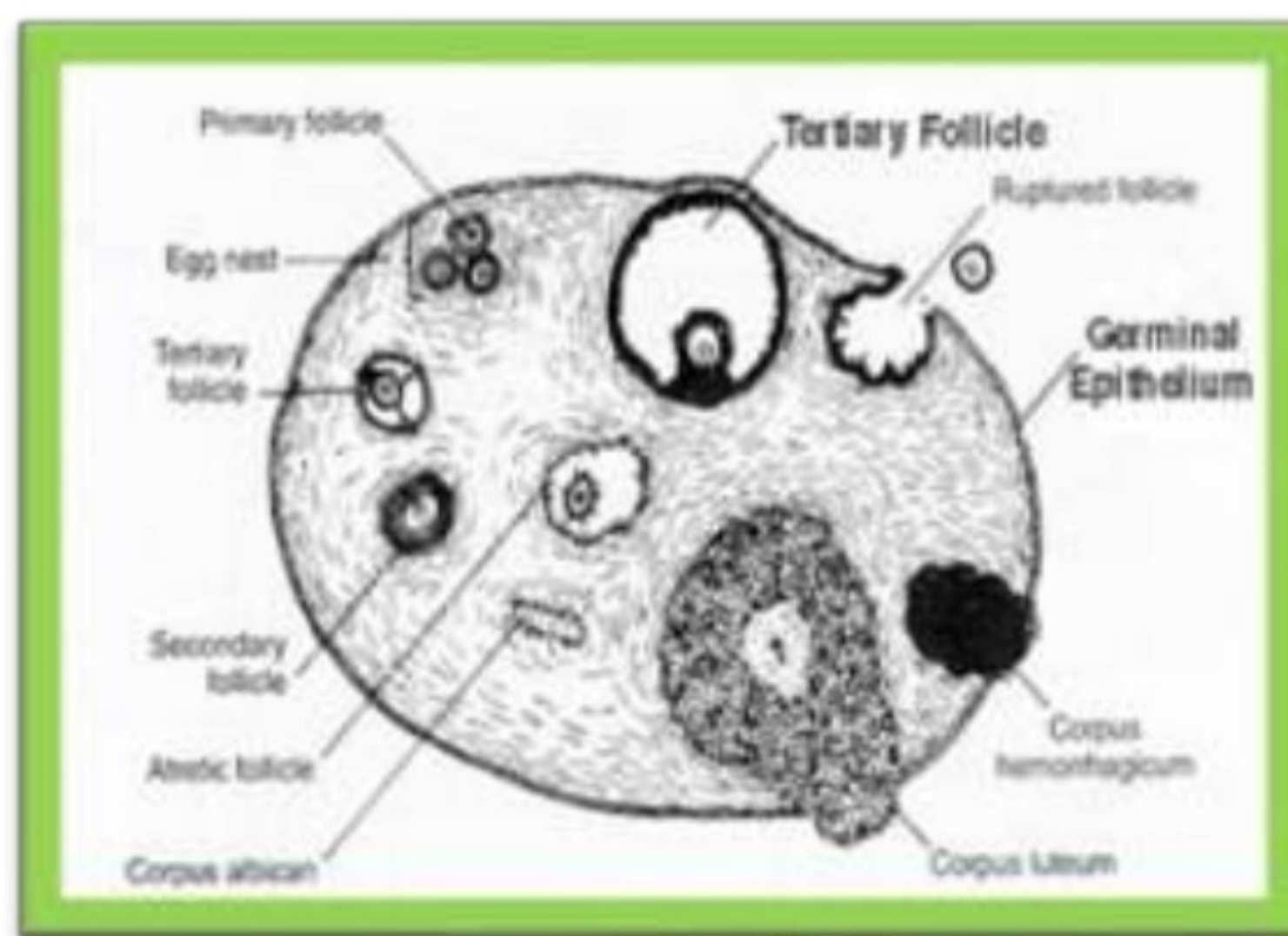
The process of formation of mature female gamete in ovaries is called oogenesis. Initial step is the production of egg which starts prior to birth. Oogonia is formed through mitosis. Oogonia is a diploid cell which develops into primary oocyte through first step of meiotic division. These oocyte develops (one at a time) and when primary oocyte develops, it undergoes meiosis-1 and forms a large secondary oocyte with a small polar body.

Meiosis-2 does not take place in first polar body, where as secondary oocyte enters metaphase stage of meiosis 2. But for completing second meiosis, it awaits for arrival spermatozoa. As sperm enters, it restarts the

process of cell cycle by breaking down MPF and turning on APCC. After this, meiosis-2 completes and secondary oocyte converted into fertilized egg or zygote.

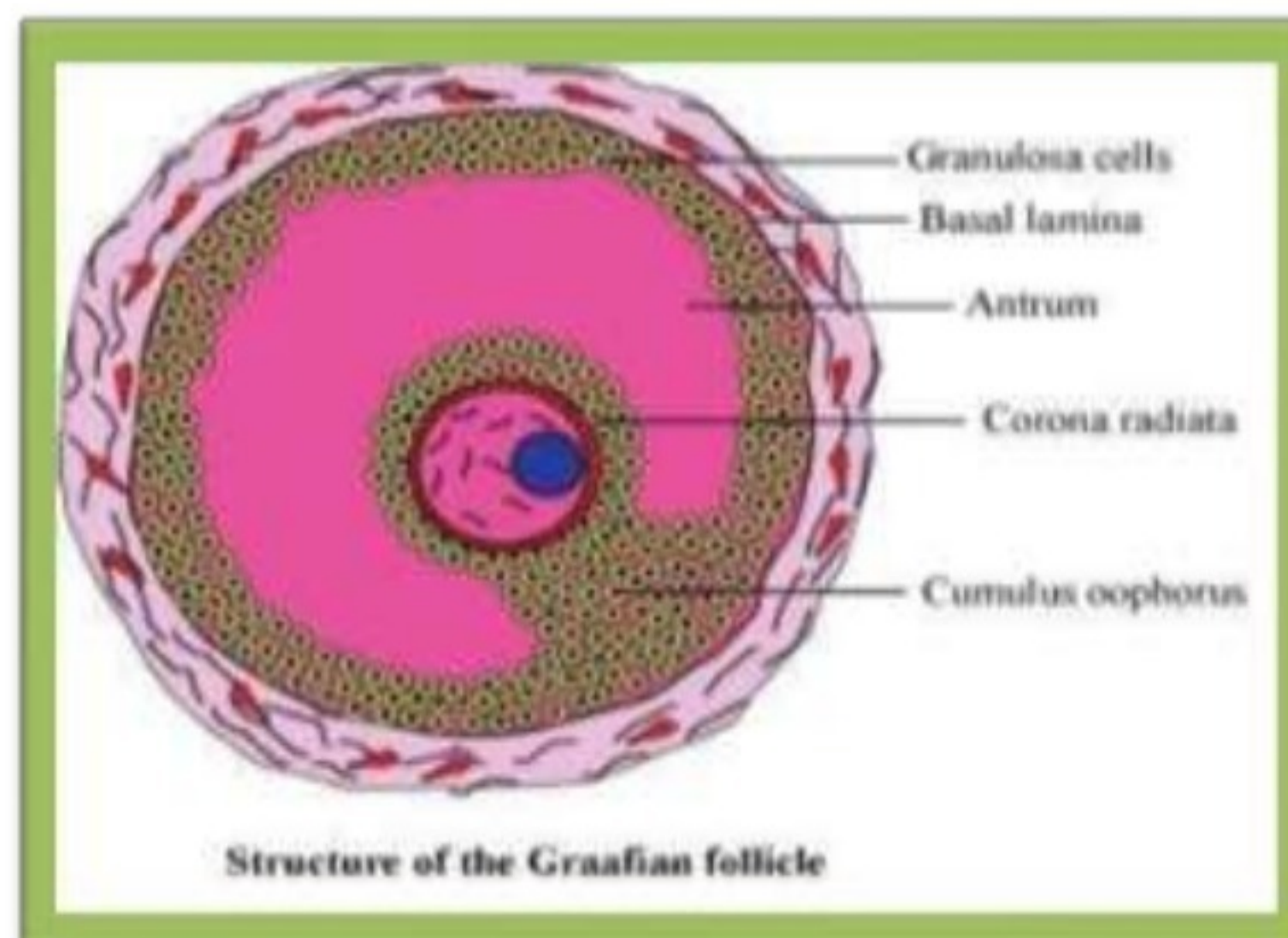
13. Draw a labelled diagram of a section through ovary.

Answer.13



14. Draw a labelled diagram of a Graafian Follicle?

Answer.14



15. Name the functions of the following.

- a) **Corpus luteum**
- b) **Endometrium**
- c) **Acrosome**
- d) **Sperm tail**
- e) **Fimbriae**

Answer.15

- a) **Corpus luteum :-** It secretes progesterone. Progesterone is essential for maintenance of endometrium.
- b) **Endometrium :-** Implantation of fertilized ovum and many events of pregnancy takes place in endometrium.
- c) **Acrosome: -** It is filled with enzymes that help in fertilisation of ovum.
- d) **Sperm tail: -** It provides motility to sperms.
- e) **Fimbriae: -** After ovulation, it helps in collection of ovum.

16. Identify True/False statements. Correct each false statement to make it true.

Answer.16

- a) **Androgens are produced by Sertoli cells. (True/False)**
- b) **Spermatozoa get nutrition from Sertoli cells. (True/False)**
- c) **Leydig cells are found in ovary. (True/False)**
- d) **Leydig cells synthesise androgens. (True/False)**
- e) **Oogenesis takes place in corpus luteum. (True/False)**
- f) **Menstrual cycle ceases during pregnancy. (True/False)**

- g) Presence or absence of hymen is not a reliable indicator of virginity or sexual experience. (True/False)**

Answer.16

- a) False. Leydig cells produce androgens.
- b) True.
- c) False. Leydig cells are found in seminiferous tubules.
- d) True.
- e) False. Oogenesis takes place in ovary.
- f) True.
- g) True.

- 17. What is menstrual cycle? Which hormones regulate menstrual cycle?**

Answer.17

In human beings, at an average interval of 28-29 days menstruation is repeated and menstrual cycle of events that takes place from one menstruation till the next one.

Estrogen plays an important role in menstrual cycle. When FSH level increases, it stimulates the growth of ovarian follicles and formation of estrogens.

- 18. What is parturition? Which hormones are involved in induction of parturition?**

Answer.18

The process of delivery of the foetus is called parturition. Oxytocin hormone causes strong contraction of uterine. Contraction of uterine

becomes stronger and stronger by the stimulatory reflex between uterine contraction and oxytocin secretion. This leads to expulsion of baby out of uterus through the birth canal.

19. In our society the women are often blamed for giving birth to daughters. Can you explain why this is not correct?

Answer.19

The sex chromosome in human female is XX while of male is XY. Thus, female produces haploid gametes having all X chromosomes but male produces two types of sex chromosomes X and Y. So, it depends upon the male gametes that which sex chromosomes either X or Y fertilises with female sex chromosome X.

20. How many eggs are released by a human ovary in a month? How many eggs do you think would have been released if the mother gave birth to identical twins? Would your answer change if the twins born were fraternal?

Answer.20

One ovum is released by a human ovary in a month.

Identical twins are developed from single egg.

If the twins are fraternal twins then they must have been developed from two eggs.

21. How many eggs do you think were released by the ovary of a female dog which gave birth to 6 puppies?

Answer.21

Dogs are polyovulatory and they release more than one ovum at a time. So, a female dog releases six ova to give birth to six puppies.

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