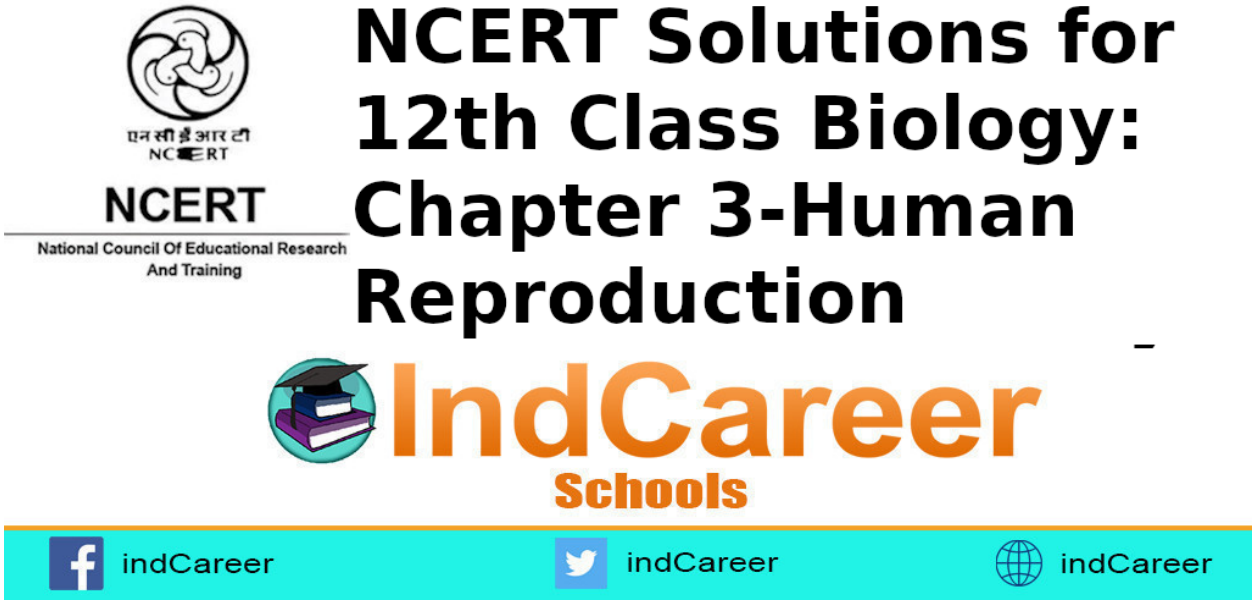

NCERT Solutions for 12th Class Biology: Chapter 3-Human Reproduction

Class 12: Biology Chapter 3 solutions. Complete Class 12 Biology Chapter 3 Notes.

NCERT Solutions for 12th Class Biology: Chapter 3-Human Reproduction

NCERT 12th Biology Chapter 3, class 12 Biology chapter 3 solutions

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Exercises

(a) Humans reproduce _____ (asexually/sexually)

► sexually

(b) Humans are _____ (oviparous, viviparous, ovoviviparous)

► viviparous

(c) Fertilisation is _____ in humans (external/internal)

► internal

(d) Male and female gametes are _____ (diploid/haploid)

► haploid

(e) Zygote is _____ (diploid/haploid)

► diploid

(f) The process of release of ovum from a mature follicle is called _____

► ovulation

(g) Ovulation is induced by a hormone called _____

► luteinzing hormone

(h) The fusion of male and female gametes is called _____

► fertilization

(i) Fertilisation takes place in _____

► fallopian tube

(j) Zygote divides to form _____which is implanted in uterus.

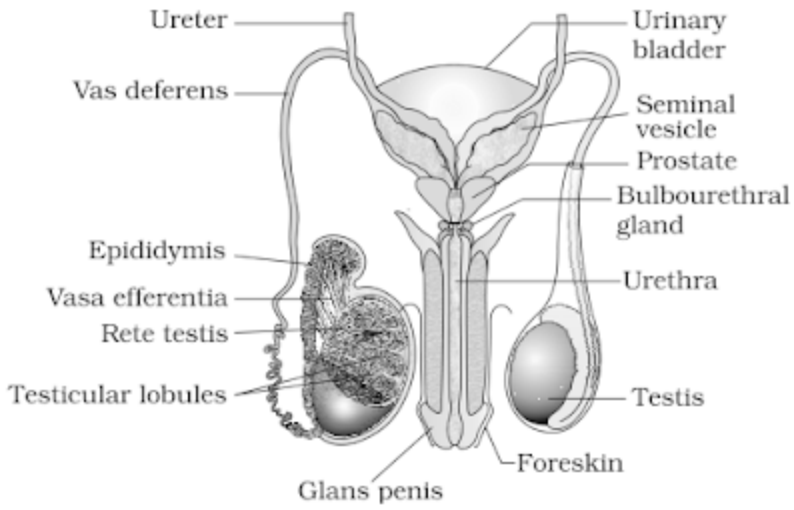
► blastocyst

(k) The structure which provides vascular connection between fetus and uterus is called _____

► placenta

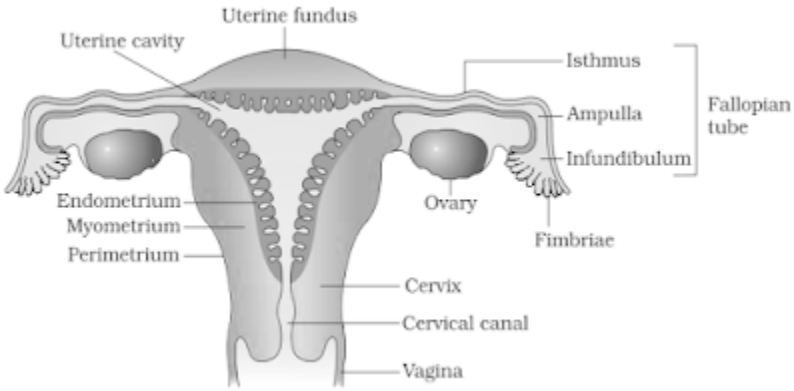
2. Draw a labeled diagram of male reproductive system.

Answer



3. Draw a labelled diagram of female reproductive system.

Answer



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

Answer

Two major functions of testis are:

• Production of sperms by seminiferous tubules by the process of spermatogenesis.

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• Production of male sex hormone, testosterone by Leydig cells.

Two major functions of ovary are:

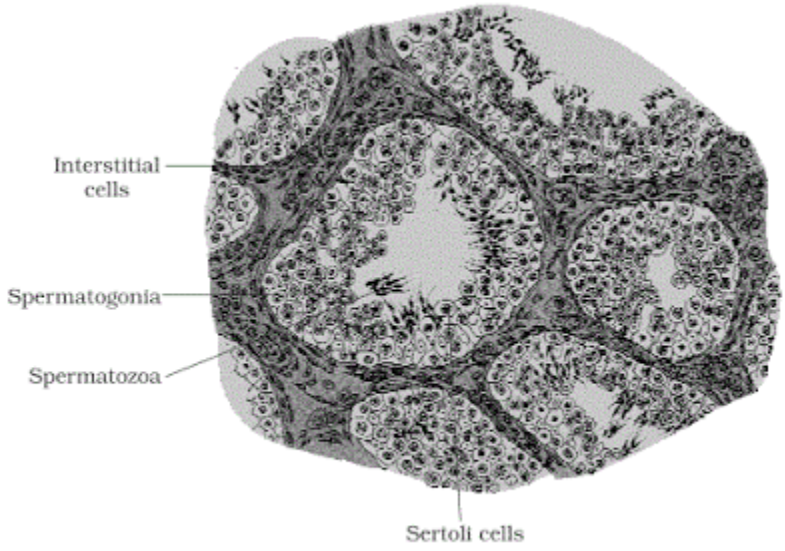
• Production of ova by oogenesis.

• Production of female sex hormone, estrogen and progesterone.

5. Describe the structure of a seminiferous tubule.

Answer

Seminiferous tubules are highly coiled structures present in testicular lobules. Each seminiferous tubule is lined on its inside by two types of cells called spermatogonia and Sertoli cells. Spermatogonia are male germ cells that undergo meiotic divisions finally leading to sperm formation, while Sertoli cells provide nutrition to the germ cells. The regions outside the seminiferous tubules called interstitial spaces, contain small blood vessels and interstitial cells or Leydig cells.



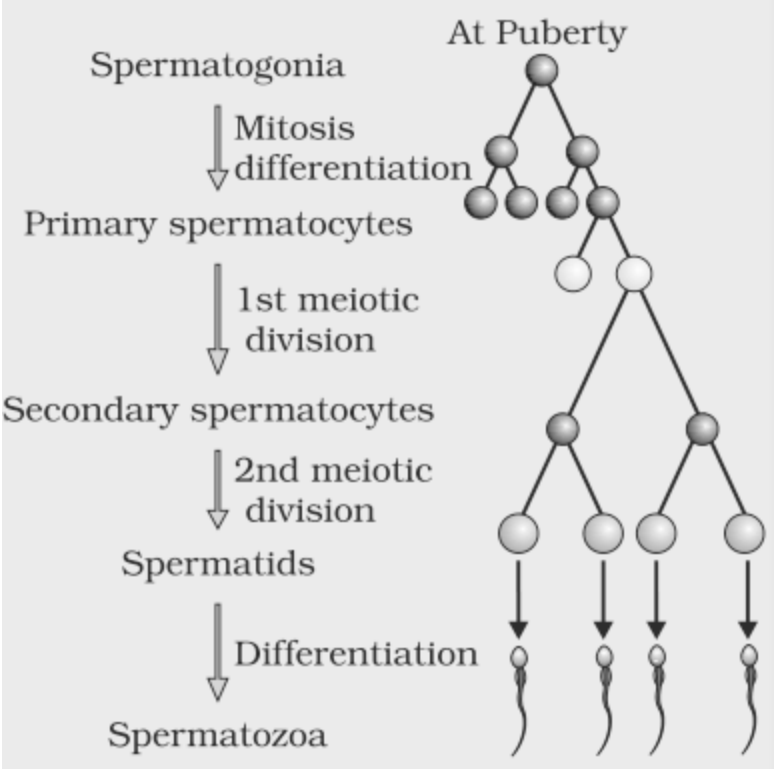
Seminiferous tubule

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

Answer

The process of the production of sperms from the immature germ cells in males is called spermatogenesis.

The male germ cell of seminiferous tubules multiply mitotically to 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. The spermatids are transformed into spermatozoa (sperms) by the process called spermiogenesis.



7. Name the hormones involved in regulation of spermatogenesis.

Answer

The hormones involved in spermatongenesis are gonadotropin releasing hormone (GnRH), luteinising hormone (LH) and follicle stimulating hormone (FSH).

8. Define spermiogenesis and spermiation.

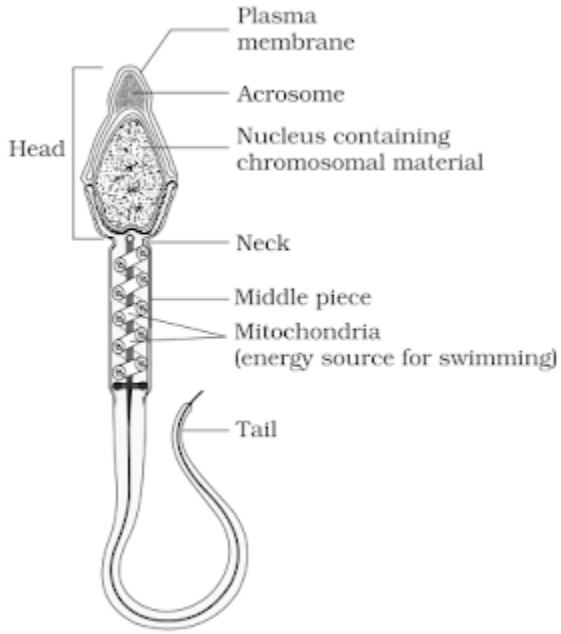
Answer

Spermiogenesis is the process of transforming spermatids into spermatozoa or sperms.

Spermiation is the process of final release of sperm cells from the seminiferous tubules, under the influence of hormonal and physiological factors.

9. Draw a labeled diagram of sperm.

Answer



10. What are the major components of seminal plasma?

Answer

Major components of human seminal plasma are fructose, citric acid, lipids, buffering agents, proteolytic enzymes all coming from the mixture of secretions of male accessory glands.

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

Answer

Major functions of male accessory ducts is storage and transportation of sperms from testis to outside through urethra.

Major functions of male accessory glands are:

• Seminal vesicles: Secrets fructose which is used as energy source by the sperm and Prostaglandins that induce muscle contraction.

• Prostate glands secrete calcium and other buffering agents to neutralise the acidic pH of vagina.

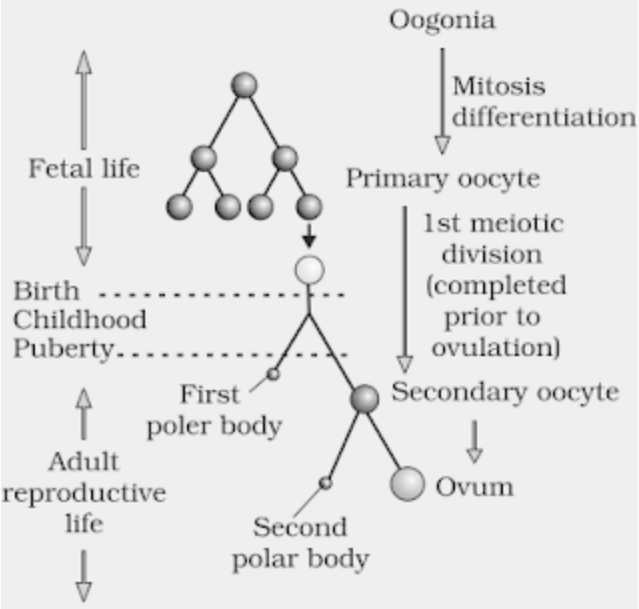
• Bulbourethral glands secrete mucus rich fluid for lubrication.

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

Answer

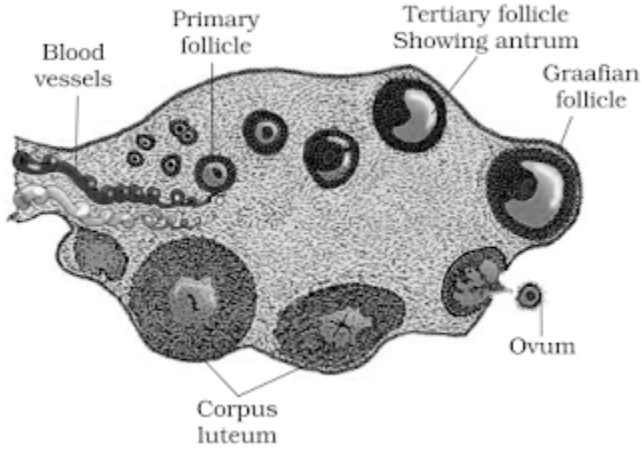
The process of the formation of a mature ovum in the ovary from the oogonia in females is known as oogenesis.

Germ cell of the female foetus divide to produce oogonia (gamete mother cell). No more oogonia are formed or added after birth. A diploid oogonium or egg mother cell increases in size and gets transformed into a diploid primary oocyte. This diploid primary oocyte undergoes meiosis or reductional division to form two unequal haploid cells. The smaller cell is known as the first polar body, while the larger cell is known as the secondary oocyte. This secondary oocyte undergoes meiosis II or equational division and gives rise to a second polar body and an ovum. Hence, in the process of oogenesis, a diploid oogonium produces a single haploid ovum while two or three polar bodies are produced.



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

Answer



14. Draw a labelled diagram of a Graafian follicle?

Answer

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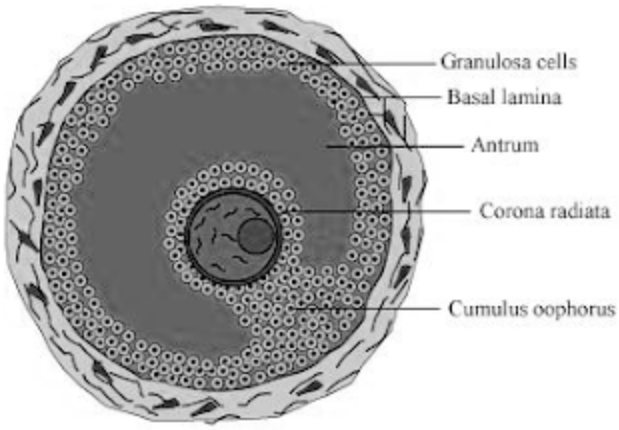

15. Name the functions of the following:

(a) Corpus luteum

► It acts as an endocrine gland and secretes progesterone hormone which is essential for endometrium of uterus.

(b) Endometrium

► It is innermost layer of uterus responsible for nutrition and development of the foetus. It undergoes cyclic changes during menstrual cycle and prepares itself for implantation of blastocyst and placentation.

(c) Acrosome

► Acrosome of sperm head contains hydrolytic enzymes that help in dissolving membranes of the ovum for fertilization.

(d) Sperm tail

► It helps in the movement of sperm essential for fertilisation.

(e) Fimbriae

► It help in collection of the ovum after ovulation.

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

(a) Androgens are produced by Sertoli cells. (True/False)

► False, Androgens are produced by Leydig cells or interstitial cells.

(b) Spermatozoa get nutrition from Sertoli cells. (True/False)

► True

(c) Leydig cells are found in ovary. (True/False)

► False, Leydig cells are found in testis.

(d) Leydig cells synthesise androgens. (True/False)

► True

(e) Oogenesis takes place in corpus luteum. (True/False)

► False, Oogenesis takes place in Graafian follicles.

(f) Menstrual cycle ceases during pregnancy. (True/False)

► True

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

► True

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

Answer

The reproductive cycle in the female primates is called menstrual cycle. The first menstruation begins at puberty and is called menarche. In human females, menstruation is repeated at an average interval of about 28/29 days, and the cycle of events starting from one menstruation till the next one is called the menstrual cycle.

The hormones regulates menstrual cycle are:

• FSH, LH stimulate growth of follicle and maturation of ovum.

• Oestrogen endometrial repair and growth.

• Oestrogen and progesterone together prepare endometrium and other parts of the body for pregnancy.

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

Answer

The process of delivery of the foetus (childbirth) at the end of pregnancy is called parturition.

The hormones involved in induction of parturition are:

• Oxytocin hormone from maternal pituitary stimulates strong uterine contractions that lead to expulsion of the baby from the uterus.

• Relaxing hormone from ovary widens the vagina to facilitate birth.

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

Answer

All human beings have 23 pairs of chromosomes. Men have 22 pairs of autosomes and contain one or two types of sex chromosome which are either X or Y while human females have 22 pairs of autosomes and contain only the X sex chromosome. The sex of an individual is determined by the type of the male gamete (X or Y), which fuses with the X chromosome of the female. If the fertilizing sperm is X, then the baby will be a girl and if it is Y, then the baby will be a boy. Hence, it is incorrect to blame a woman for the gender of the child.

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

Only one egg is released by human ovary, in a month.

Only one egg is released if the mother gave birth to identical twins.

Two or more eggs are released if the twins born were fraternal.

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

Answer

Six eggs were released by the ovary of a female dog which gave birth to six puppies.

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Organise pre-service and in-service training of teachers; develop and disseminate innovative educational techniques and practices;collaborate and network with state educational departments, universities, NGOs and other educational institutions; act as a clearing house for ideas and information in matters related to school education; and act as a nodal agency for achieving the goals of Universalisation of Elementary Education.
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