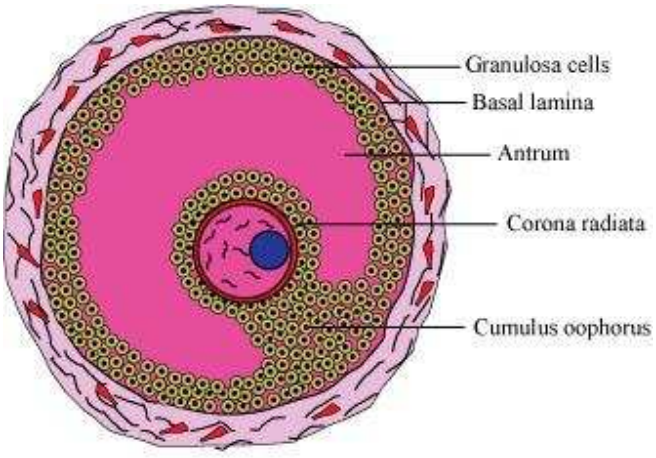
Question 14:

Draw a labeled diagram of a Graafian Follicle?

Answer



Structure of the Graafian follicle

Question 15:

Name the functions of the following.

(a) Corpus luteum

(b) Endometrium

(c) Acrosome

(d) Sperm tail

(e) Fimbriae

Answer

(a) Corpus luteum – Corpus luteum is formed from the ruptured Grafiaan follicle. It secretes progesterone hormone during the luteal phase of the menstrual cycle. A high level of progesterone inhibits the secretions of FSH and LH, thereby preventing ovulation. It also allows the endometrium of the uterus to proliferate and to prepare itself for implantation.

(b) Endometrium – It is the innermost lining of the uterus. It is rich in glands and undergoes cyclic changes during various phases of the menstrual cycle to prepare itself for the implantation of the embryo.

(c) Acrosome – It is a cap-like structure present in the anterior part of the head of the sperm. It contains hyaluronidase enzyme, which hydrolyses the outer membrane of the egg, thereby helping the sperm to penetrate the egg at the time of fertilization.

(d) Sperm tail – It is the longest region of the sperm that facilitates the movement of the sperm inside the female reproductive tract.

(e) Fimbriae – They are finger-like projections at the ovarian end of the fallopian tube. They help in the collection of the ovum (after ovulation), which is facilitated by the beating of the cilia.

Question 16:

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

(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

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

Androgens are produced by Leydig cells found in seminiferous tubules of the testis.

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

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

Leydig cells are found in the seminiferous tubules of the testis.

(d) Leydig cells synthesise androgens. (True)

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

Oogenesis takes place in the ovary.

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

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

Question 17:

What is menstrual cycle? Which hormones regulate menstrual cycle?

Answer

The menstrual cycle is a series of cyclic physiologic changes that take place inside the female reproductive tract in primates. The whole cycle takes around 28 days to complete. The end of the cycle is accompanied by the breakdown of uterine endothelium, which gets released in the form of blood and mucous through the vagina. This is known as menses.

The follicle stimulating hormone (FSH), luteinizing hormone (LH), estrogen, and progesterone are the various hormones that regulate the menstrual cycle. The level of FSH and LH secreted from the anterior pituitary gland increases during the follicular phase. FSH secreted under the influence of RH (releasing hormone) from the hypothalamus stimulates the conversion of a primary follicle into a graafian follicle. The level of LH increases gradually leading to the growth of follicle and secretion of estrogen. Estrogen inhibits the secretion of FSH and stimulates the secretion of luteinizing hormone. It also causes the thickening of the uterine endometrium. The increased level of LH causes the rupturing of the graafian follicle and release the ovum into the fallopian tube. The ruptured graafian follicle changes to corpus luteum and starts secreting progesterone hormone during the luteal phase. Progesterone hormone helps in the maintenance and preparation of endometrium for the implantation of the embryo. High levels of progesterone hormone in the blood decrease the secretion of LH and FSH, therefore inhibiting further ovulation.

Question 18:

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

Answer

Parturition is the process of giving birth to a baby as the development of the foetus gets completed in the mother's womb. The hormones involved in this process are oxytocin and relaxin. Oxytocin leads to the contraction of smooth muscles of myometrium of the uterus, which directs the full term foetus towards the birth canal. On the other hand, relaxin hormone causes relaxation of the pelvic ligaments and prepares the uterus for child birth.

Question 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. Human males have 22 pairs of autosomes and contain one or two types of sex chromosome. They are either X or Y. On the contrary, 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.

Question 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

An ovary releases an egg every month. When two babies are produced in succession, they are called twins. Generally, twins are produced from a single egg by the separation of early blastomeres resulting from the first zygotic cleavage. As a result,

the young ones formed will have the same genetic make- up and are thus, called identical twins.

If the twins born are fraternal, then they would have developed from two separate eggs. This happens when two eggs (one from each ovary) are released at the same time and get fertilized by two separate sperms. Hence, the young ones developed will have separate genes and are therefore, called non-identical or fraternal twins.

Question 21:

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

Answer

Dogs and rodents are polyovulatory species. In these species, more than one ovum is released from the ovary at the time of ovulation. Hence, six eggs were released by the ovary of a female dog to produce six puppies.