

**CBSE Class 12 Biology**  
**Important Questions**  
**Chapter 3**  
**Human Reproduction**

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**1 Marks Questions**

**1. Failure of testes to descend into scrotal sacs leads to sterility. Why?**

**Ans.** High temperature of abdomen kills the spermatogenic tissue of the testes, so no sperm are formed.

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**2. Both vaccine and colostrum produce immunity. Name type of immunity produced by these.**

**Ans.** Vaccine Active immunity Colostrum Passive immunity.

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**3. How many sperms will be produced from 10 primary spermatocytes and how many eggs will be produced from 10 primary oocytes?**

**Ans.** 40 sperms, 10 eggs.

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**4. The spermatogonial cell has 46 chromosomes in human male. Give the number of chromosomes in**

**(a) Primary spermatocyte (b) Spermatid**

**Ans. (a)** 46 in Primary spermatocyte

**(b)** 23 in spermatid.

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**5. In ovary which structure transforms as corpus luteum and name the hormone secreted by corpus luteum?**

**Ans.** Follicular cells of empty Graafian follicle.

Progesterone.

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**6. “Each and every coitus does not results in fertilisation and pregnancy”. Justify the statement.**

**Ans.** Ovum and sperm should reach simultaneously to the ampullary – isthmic junction.

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**7. Why are male testes located outside the abdominal cavity?**

**Ans.** The male testes are located in the scrotum outside the abdominal cavity as the scrotum provides low temperature than the normal body temperature required for spermatogenesis.

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**8. State the function of leydig cells.**

**Ans.** The leydig cells synthesise and secrete testicular hormones called androgens.

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**9. Where do we find fimbriae?**

**Ans.** Fimbriae are finger like projections found in the edges of the infundibulum.

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**10. What is semen?**

**Ans.** The seminal plasma along with the sperms constitutes semen.

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**11. Define parturition.**

**Ans.** The vigorous contraction of the uterus that results into the delivery of the child at the end of pregnancy is called parturition.

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**12. Where does fertilization normally takes place in a human female.**

**Ans.** Ampulla (fallopian tube).

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**13. Name the substance present in the sperm acrosome & which help in sperms entry into egg.**

**Ans.** Acrosome contains enzymes e.g. hyaluronidase that helps in dissolving membrane of ovum.

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**14. Name the layer of cells that forms the outer wall of blastocyst.**

**Ans.** Trophoblast.

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**15. At what stage is the mammalian embryo implanted in uterus?**

**Ans.** Blastocyst stage.

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**16. Despite the presence of So many sperms in the vicinity of an egg cell, only one sperm enters the ovum. Why?**

**Ans.** Because when a sperm comes in contact with ovum (zona pellucida) & induces changes in membrane to block entry of other sperms.

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**17. How many polar bodies are given out in production of one egg during cogenesis?**

**Ans.** Two polar bodies

### **2 Marks Questions**

**1. Give the function of**

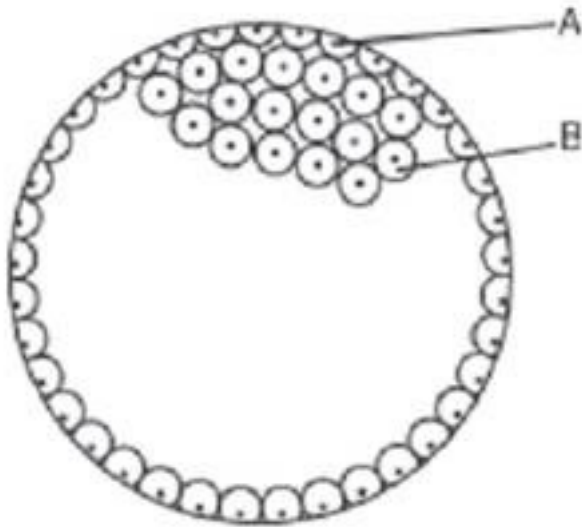
**(a) Corpus luteum**

**(b) Endometrium**

**Ans.** Corpus luteum : It secretes progesterone which prepares endometrium of uterus for implantation and normal development of foetus.

Endometrium : It undergoes cyclic changes during menstrual cycle and prepares itself for implantation of blastocyst.

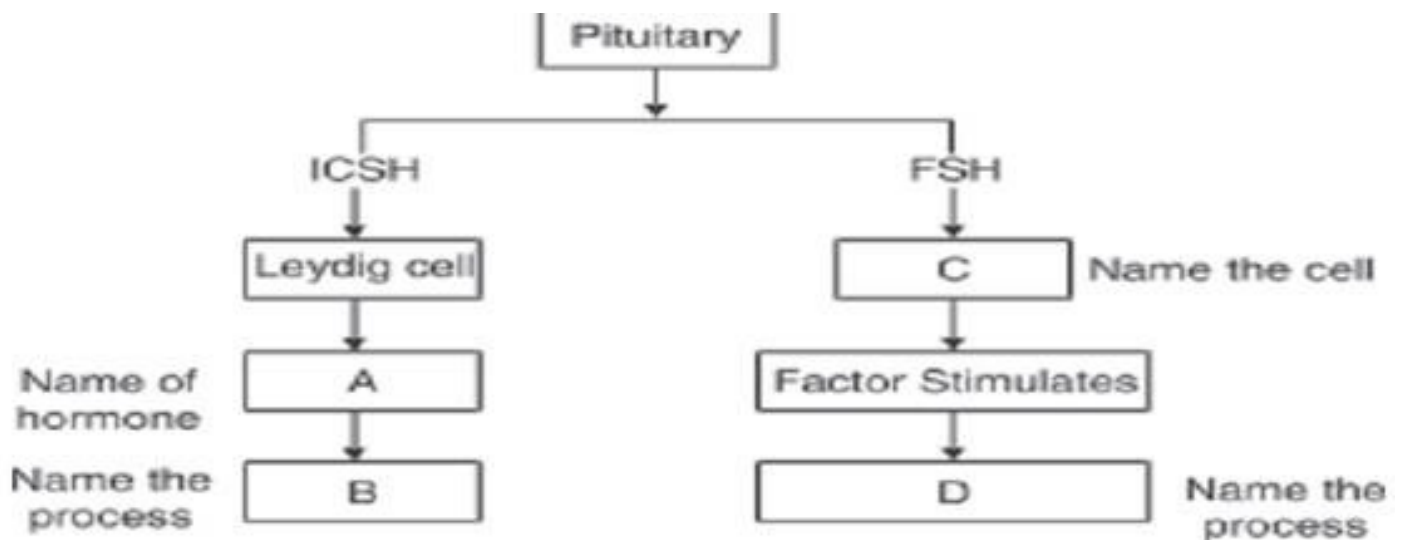
2. In the given figure, give the name and functions of parts labeled A and B.



**Ans.** A = Trophoblast Gets attached to endometrium and draws nutritive material secreted by uterine endometrium gland.

B = Inner cell mass Differentiates as Embryo.

3. Given below is an incomplete flow chart showing influence of hormone on gametogenesis in male, observe the flow chart carefully and fill in the blank A, B, C and D.



**Ans.** A = Testosterone; B = Spermatogenesis

C = Sertoli cells; D Spermiogenesis

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**4. Give reason for the following :**

**(a) The first half of the menstrual cycle is called follicular phase as well as proliferative phase.**

**(b) The second half of the menstrual cycle is called luteal phase as well as secretory phase.**

**Ans. (a)** During this phase, primary follicles transform into Graafian follicle under FSH stimulation. Graafian follicles secrete estrogens which stimulate enlargement of Endometrium of uterus.

**(b)** During this phase, Corpus luteum is fully formed and secretes large quantity of Progesterone.

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**5. What is meant by L.H. Surge? Write the role of L.H.**

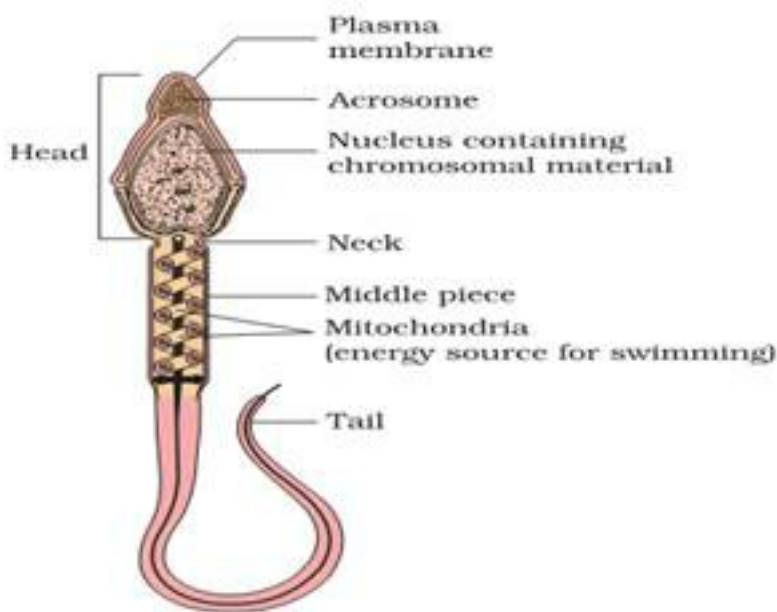
**Ans.** There are three phases in your menstrual cycle – follicular phase, ovulatory phase and luteal phase. In terms of the luteinizing hormone (LH) surge, the ovulatory phase is most important. During the follicular phase the follicle develops at the beginning of the menstrual cycle. This cycle begins with the menstrual period, the shedding of the uterine lining and the shedding cleanses the lining of the uterus in preparation for ovulation during the ovulatory phase.

**6. Explain significance of the condition in which the testes remain suspended in scrotum outside the abdomen.**

**Ans.** Human sperm cells cannot develop at body temperature. Spermatogenesis and maintenance of the seminiferous tubules requires a temperature slightly lower than that of the body. This is provided by the scrotum, which lies outside the abdominal cavity.

**7. Describe the structure of a sperm with a diagram.**

**Ans.** The human sperm is a microscopic structure with a head, middle piece and a tail. The head has the haploid nucleus and an anterior acrosome that contains the enzymes required for the fertilization of the egg. The middle piece has numerous mitochondria to produce the energy for the mobility of the tail of the sperm.



**8. Enlist any two functions of a female placenta.**

**Ans.** The structural and the functional unit between the developing embryo and the mother called placenta facilitates the supply of nutrients, oxygen to the embryo and also the removal of carbon dioxide and other excretory products produced by the embryo. It also acts as endocrine tissue and produces several hormones

**9. What is the number of chromosomes in the following cells? Primary oocyte, secondary oocyte, ootid and follicle.**

**Ans.** The number of chromosome in the cells is as follows:

Primary oocyte: 23 pairs. Secondary oocyte: 23. Ootid: 23. Follicle: 23 pairs.

**10. What is corpus luteum. How dose it functions as endocrine gland?**

**Ans.** After ovulation, the graffian follicle ruptures & forms corpus luteum. Corpus luteum functions as endocrine glands as they secrete progesterone & estrogen in large quantities.

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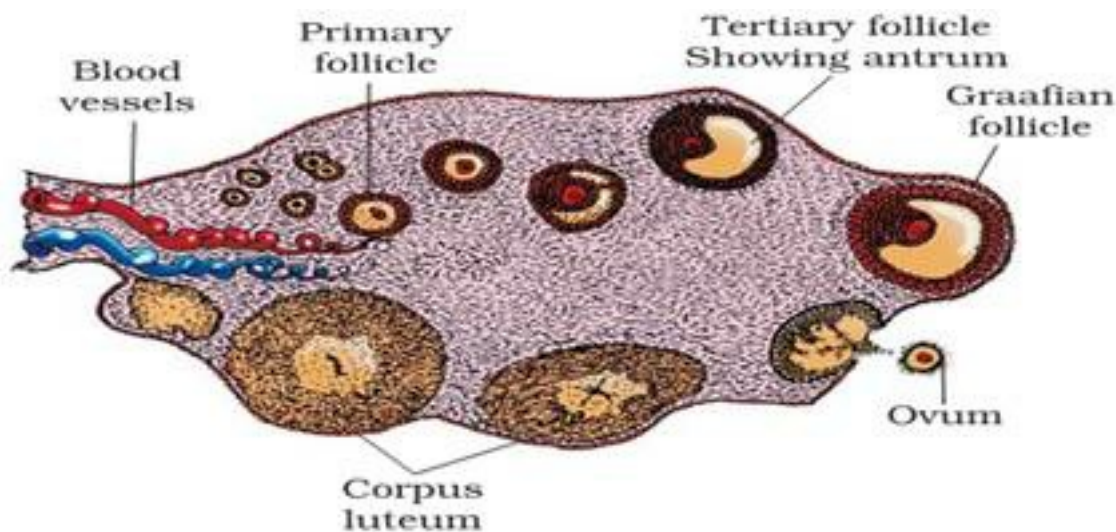
**11. Where are leydig cells located? What do they secrete?**

**Ans.** Leydig cells or interstitial cells are located in between the sominiferous tubules. Leydig cells secrete male sex hormone TESTOSTERONE which promotes development of accessory glands & control male secondary sexual characters.

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**12. Draw well labeled diagram of T.S. of ovary?**

**Ans.**

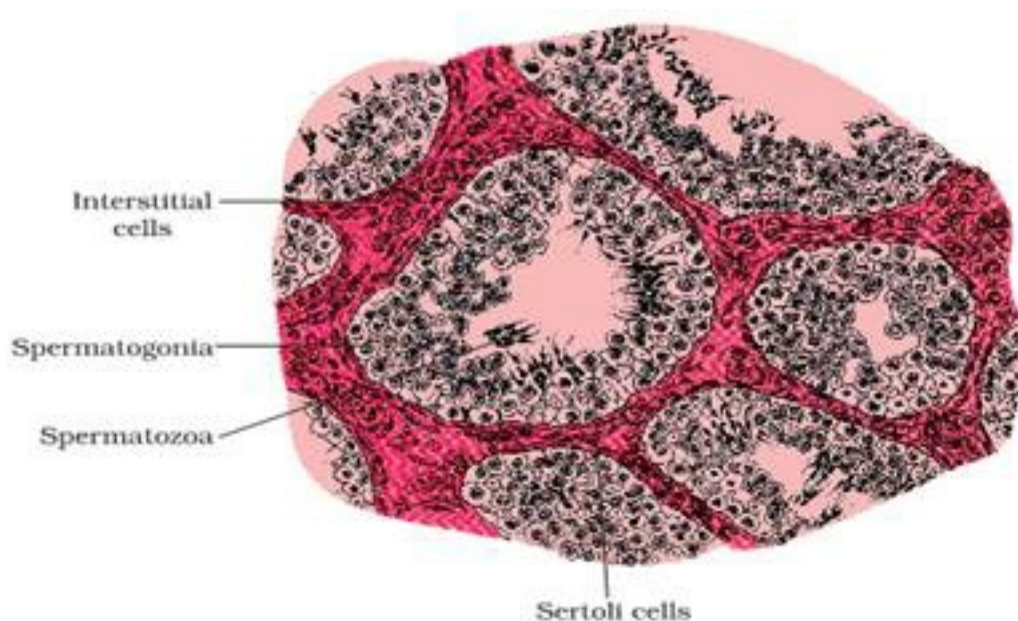


**13. Why testes of human males are considered extra abdominal? What is the significance of this condition?**

**Ans.** Testis in human males are called extra- abdominal because testis are located outside the abdominal cavity in a pouch called scrotum which provides a temperature 2-3oC lower than body temperature necessary for spermatogenesis.

**14. Draw a diagram of the T.S. of seminiferous tubule of testis of an adult human male & label any four parts in it.**

**Ans.**



**15. What is colostrum? What is its significance to new born baby?**

**Ans.** The milk secreted from mammary glands just after birth for 2 or 3 days is called colostrum. It is rich in proteins & low in fats. It also contains antibody IgA which provides immunity to new born infant.



### 3 Marks Questions

**1. Mention the name and role of hormones which are involved in regulation of gamete formation in human male.**

**Ans.** GnRH : Stimulates adenophysis to secrete gonadotrophins.

**GSH :** Stimulates Sertoli cells to secrete factors while help inspermatogenesis.

**ICSH :** Stimulates interstitial cells to secrete testosterone.

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**2. Three of the steps of neuro endocrine mechanism in respect of parturition are mentioned below.**

**Write the missing steps in proper sequence.**

**(a) Signals originate from fully developed foetus and placenta.**

**(b) \_\_\_\_\_.**

**(c) \_\_\_\_\_.**

**(d) Oxytocin causes strong uterine contraction**

**(e) Uterine contraction stimulates further secretion of oxytocin.**

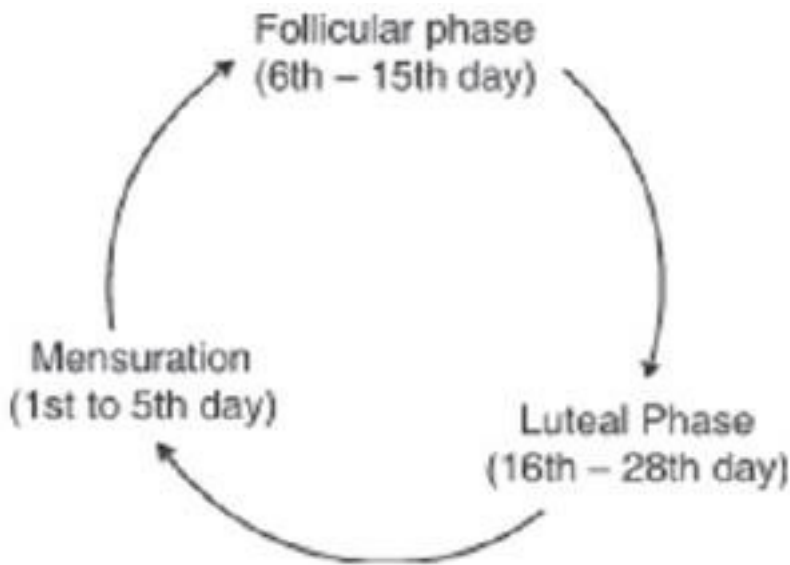
**(f) \_\_\_\_\_.**

**Ans. (b)** Foetal ejection reflex

**(c)** The reflex triggers release of oxytocin

**(f)** Expulsion of the baby out through birth canal.

3. The events of the menstrual cycle are represented below. Answer the following questions.



(i) State the levels of FSH, LH and Progesterone simply by mentioning high or low around 13th and 14th day and 21st to 23rd day.

(ii) In which of the above mentioned phases does egg travel to fallopian tube?

(iii) Why there is no mensuration after fertilisation?

Ans. (i) 13-14th day 21st -23rd day

FSH - High Low

LH - High Low

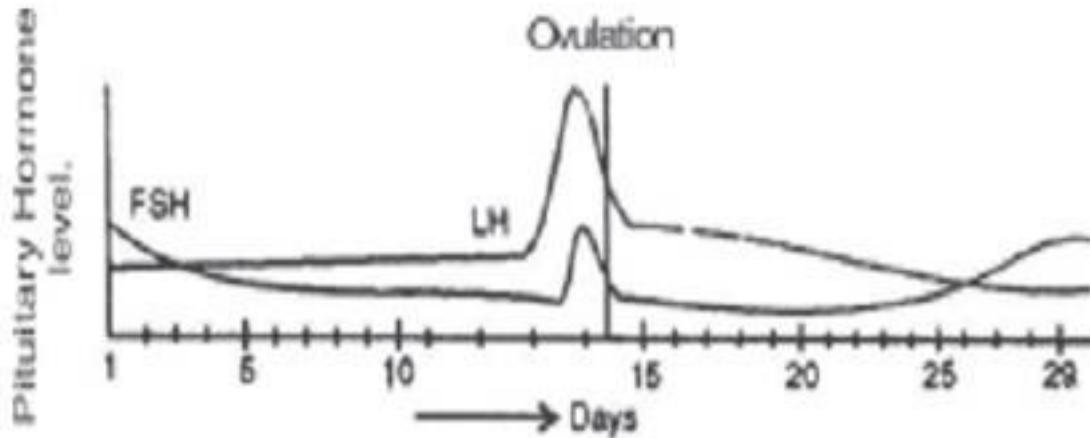
Progesterone - Low High

(ii) End of follicular or proliferative phase.

(iii) Menstruation does not occur during pregnancy upon fertilization due to high level of progesterone secreted by persisting corpus luteum and Placenta.

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4. (a) Read the graph given below. Correlate the ovarian events that take place in the human female according to the level of the pituitary hormone during the following day.



(i) 10th - 14th days (ii) 14th -15th days

(iii) 16th - 23th days (iv) 25th - 29th days

(If the ovum is not fertilised)

(b) What are the uterine events that follow beyond 29th day if the ovum is not fertilised?

Ans. (a) (i) Gonadotropins and FSH increases

(ii) LH attains peak level but FSH decreases

(iii) LH and FSH level decreases

(iv) LH remains low and FSH increases.

(b) After 29th day there is a menstrual flow involving discharge of blood and cast off endometrium lining.

5. T.S. of mammalian testis revealing seminiferous tubules show different types of cell.

(i) Name the two types of cells of germinal epithelium.

(ii) Name of cells scattered in connective tissue and lying between seminiferous tubules.

Differentiate between them on the basis of their functions.

**Ans. (i)** Germinal epithelium have two types of cell. 1. Spermatogonium. 2. Sertoli cells

**(ii)** Leydig cells or Interstitial cells.

Functions

Spermatogonium undergoes meiotic division leading to sperm formation.

Sertoli cell : Nourishes germ cells

Leydig cell : Synthesise and Secrete hormone androgen.

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**6. What are the various male accessory glands? Give their function.**

**Ans.** The male accessory glands include paired seminal vesicles, a prostate gland and paired bulbourethral glands.

These glands secrete seminal plasma rich in fructose, calcium and certain enzymes.

Secretions of bulbourethral glands help in lubrication of the penis.

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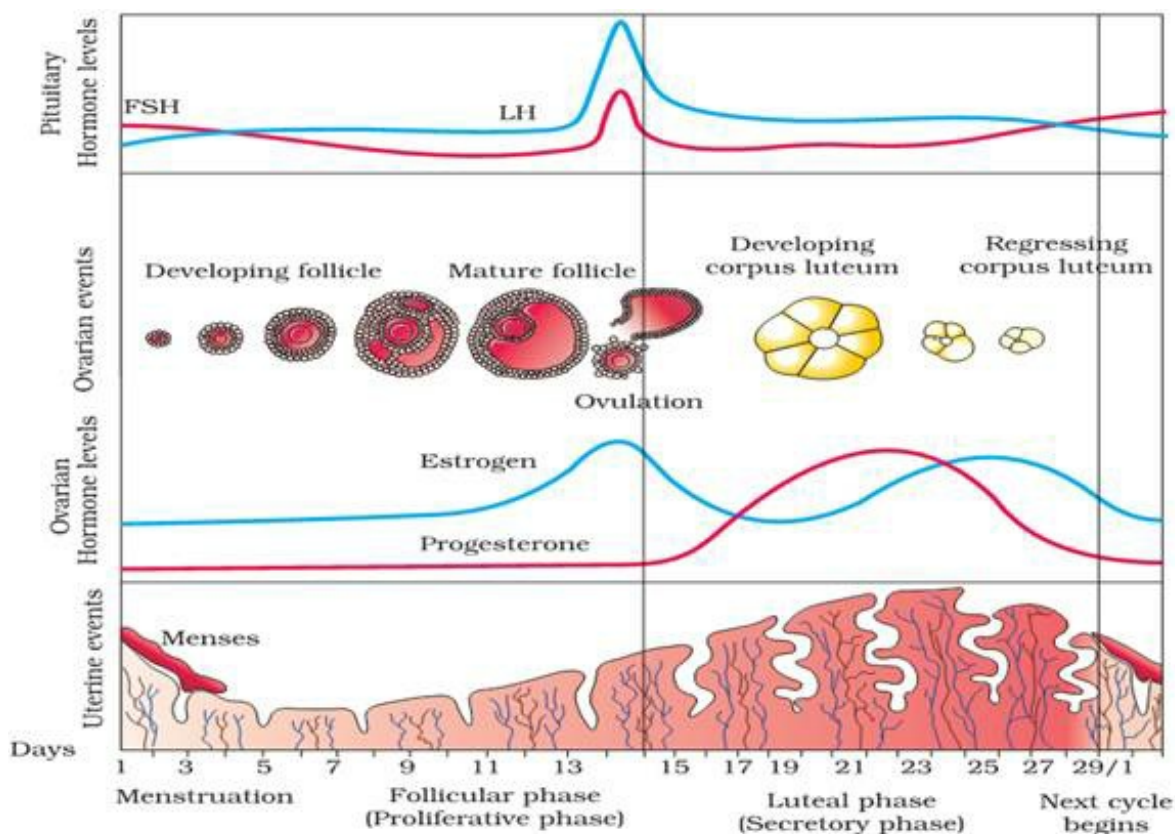
**7. Explain the menstrual cycle with a diagram.**

**Ans.** Menstrual cycle has three phases: menstrual, proliferative and secretory.

a) Menstrual Phase: The phase lasts for 3-5 days in human females and during this period the endometrial lining of the uterus is cast off and is slowly passed out from vagina as a mixture of blood.

b) Proliferative or Follicular Phase: It lasts for 11 days between 6th to 16th day of the cycle. During this phase one ovarian follicle is changed into Graafian follicle and the endometrial layer is rebuilt along with repair of the ruptured blood vessels. Estrogen increases. It ends with ovulation.

c) Secretory Phase: It lasts for 12 days between 17-28 days. The Graafian follicle is converted to Corpus Luteum. The endometrium grows and thickens further. Progesterone increases. It ends with the conversion of corpus luteum to corpus albic



## 8. Differentiate between spermatogenesis and oogenesis.

Ans.

Spermatogenesis	Oogenesis
1. It occurs inside the testes.	1. It occurs inside the ovary.
2. All the stages are completed inside the testes.	2. Majority occurs inside the ovary but last stages occur in the oviduct.
3. Spermatogonia develop from the germinal epithelium lining in the seminiferous tubules.	3. Oogonia develop from the germinal epithelium overlying the ovary.
4. All spermatogonia give rise to spermatocytes.	4. Only few oogonia give rise to oocytes.
5. Primary spermatocytes divide by meiosis	5. Primary oocyte undergoes meiosis I to give rise to one secondary oocyte and a

I to give rise to two secondary spermatocytes	polar body.
6. Secondary spermatocyte divides by meiosisII to give rise to two spermatids.	6. Secondary oocyte divides by meiosisII to form the ovum and the second polar body.
7. Each spermatid differentiates into spermatozoan or sperm.	7. No differentiation is required after meiosisII.
8. The sperms formed are motile.	8. The ovum or egg is non- motile.

### 9. 'A fertilized egg is the blue print of future development'. Explain

**Ans.** The sperm carries the genetic information from the father in form of 23 chromosomes (including the male sex chromosome X or Y) while the egg bears the genetic information from the mother (including the female sex chromosome X). Thus during fertilization the fusion of the male and the female gametes produce new genetic combination which introduces variation in the progeny. The zygote or the fertilized egg contain the genetic information which accordingly controls the development of the embryo.

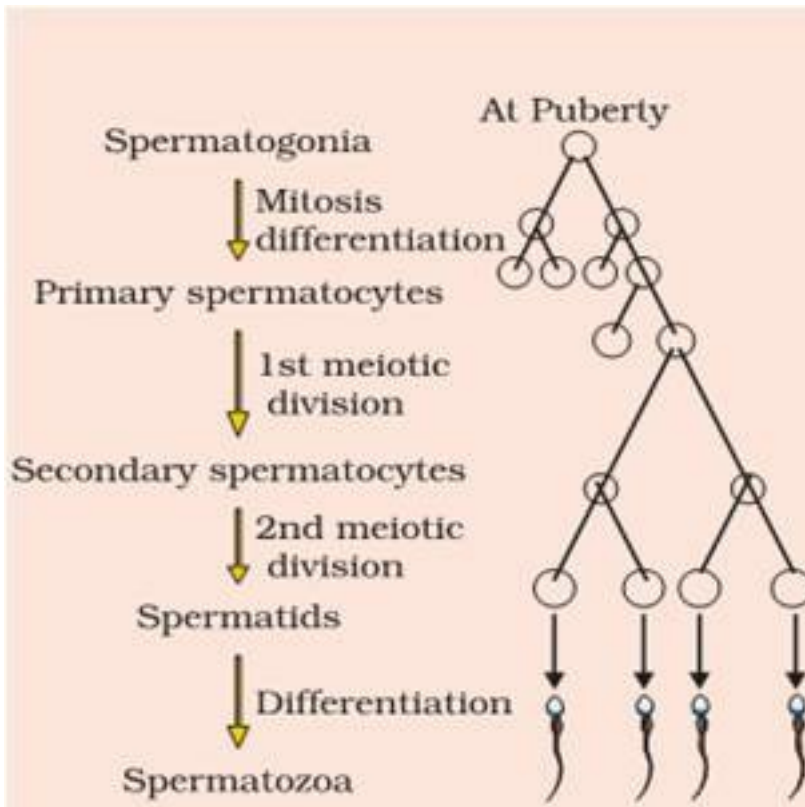
### 10. Briefly describe the stages of spermatogenesis in human?

**Ans.** Spermatogenesis consists of two phases:-

#### I. FORMATION OF SPERMATIDS :- It further consist of 3 phases

1. Multiplication phase :- undifferentiated germ cells undergo repeated division to produce sperm mother cell or spermatogonia.
2. Growth phase :- Spermatogonia increase in volume & is now called PRIMARY SPERMATOCYTES.
3. Maturation phase: - primary spermatocyte undergoes meiosis I to produce small size haploid secondary spermatocyte secondary spermatocyte divides by meiosis – II & forms haploid Spermatids.

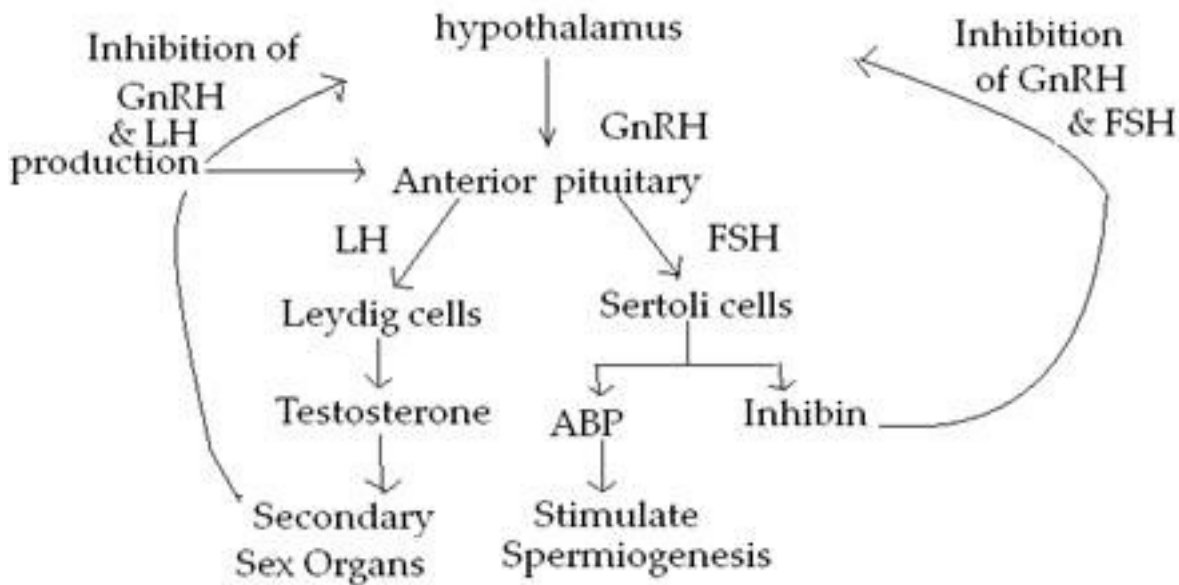
**II.FORMATION OF SPERMS :-** The transformation or differentiation of spermatids into spermatozoa or sperm is called spermiogenesis & occurs under the influence of FSH



**11. Describe the hormonal control of human male reproduction system with the help of a flow chart & highlight the inhibitory & stimulatory directions in it?**

**Ans.** i) Spermatogenesis is initiated due to an increase in the secretion of Gonadotropin releasing hormone from hypothalamus at the age of puberty.

1. The increased levels of GnRH act on anterior pituitary & stimulate the secretion of two gonadotropins i-e. leuteinizing hormone (LH) & follicle stimulating hormone (FSH)
2. LH acts on leydig cells & stimulate them to secrete testosterone
3. FSH acts on sertoli cells & stimulate secretion of some factors help in spermiogenesis

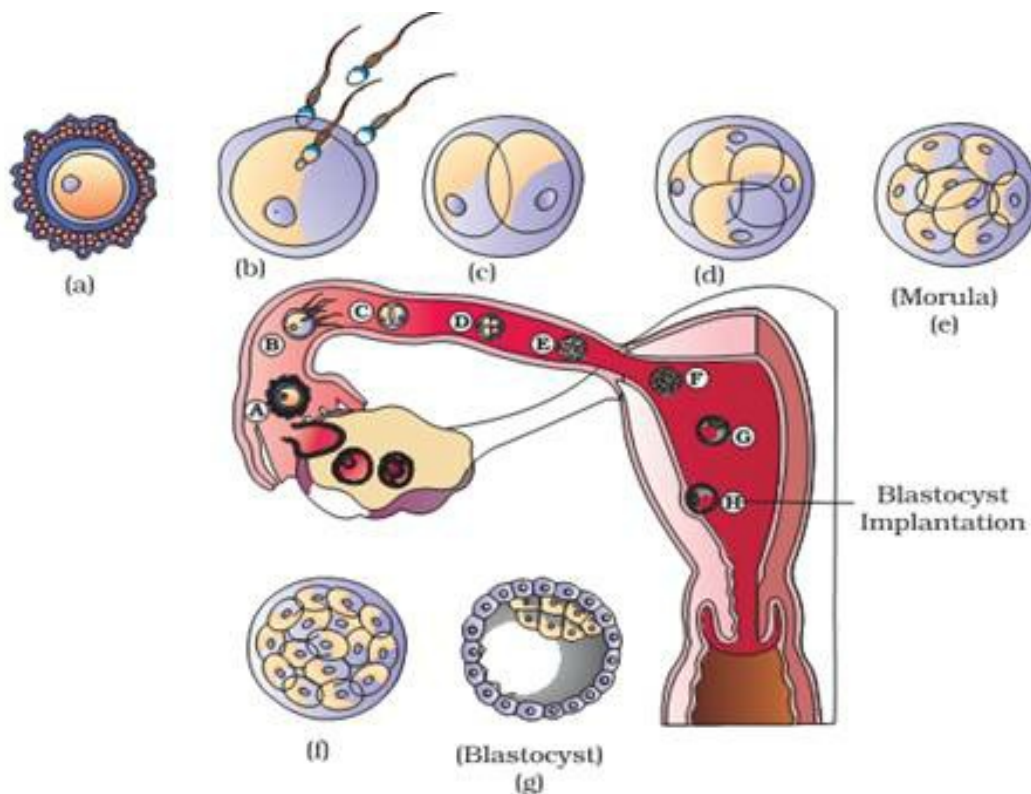


**12. A sperm has just fertilized a human egg in the fallopian tube. Trace the events that the fertilized eggs will undergoes upto implantation of blastocyst in the uterus.**

**Ans. 1. CLEAVAGE :-**Fertilized egg starts dividing lay specific mitotic divisions called cleavage. The zygotes undergoes mitotic division in the isthmus of oviduct to form daughter cell the cells formed as a result of cleavage called blastomere

**2. BLASTOCYST :-** 3-4 days after fertilization, the morula twins into large mass of cells called blastocyst Outer peripheral cells enlarge & flatten further & form trophoblast. Trophoblast cells secretes a fluid into interior & form a cavity called blastocoel. The embryonic stage with blastocoels is called blastula.

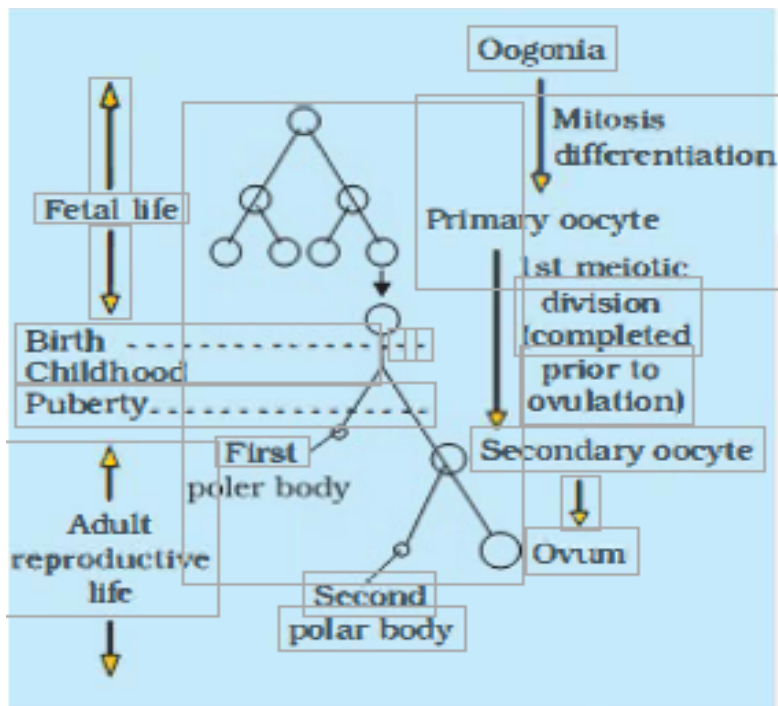




### 13. Where oogenesis does takes place. Describe the stages of this process?

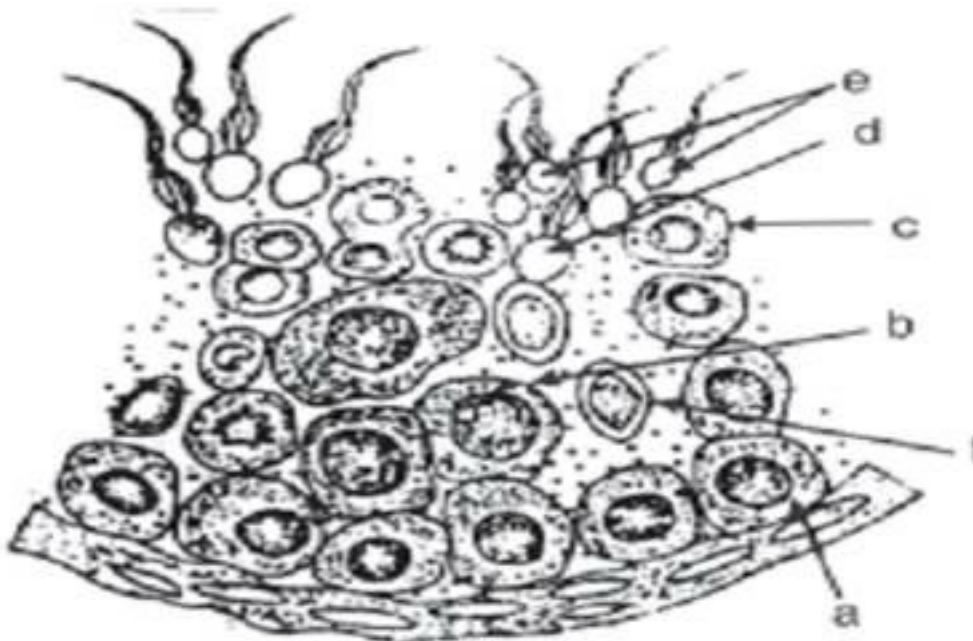
**Ans.** The process of formation & maturation of ovum is called oogenesis. It takes place in ovary & is initiated during embryonic development of female foetus. It consists of 3 phases :-

1. Multiplication phase :- The primordial germ cells divide by meiosis to produce oogonia. These oogonia divide lay repeated mitotic divisions forming clusters. In each cluster only one of them enters into growth phase & is called primary oocyte.
2. Growth phase :- Growth phase occurs only after attainment of puberty. It involves – increase in size of oocyte to many folds & synthesis of you.
3. Maturation phase :- The first division is meiotic as a result two haploid (n) cells are produced. In this division, cytobinesis is unequal, large daughter cell with almost all cytoplasm is called secondary oocyte & smaller me with less cytoplasm is called polar body. The secondary oocyte then undergoes second meiotic division to form an ovum & second polar body.



### 5 Marks Questions

1.



**Ans.** (i) 'D' Spermatids = undergo spermiogenesis

(ii) 'A' = Spermatogonium; B = Primary spermatocyte

(iii) 'B' = Diploid E = Haploid

(iv) 'F' = Sertoli cells - Nutrition to germ cells

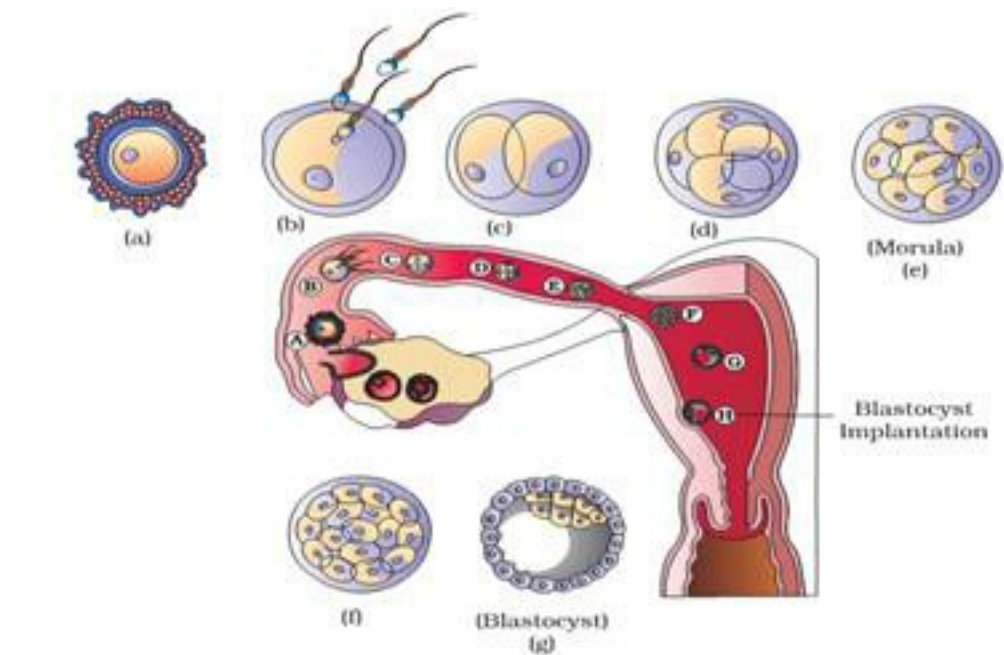
(v) Mitosis in Cell 'A', Meiosis in cell 'B'

## 2. Explain the development of human embryo with diagrams.

**Ans.** The Fusion of the sperm and the egg in humans result into formation of the diploid structure called zygote. The zygote starts dividing mitotically as it moves through the oviduct into the uterus to form 2,4,8,16 daughter cells called blastomeres. The stage is called morula. The Morula divides further and differentiates into blastocysts. The outer layer of blastomeres called trophoblast gets attached to the endometrial layer of the uterus.

The uterine wall divides and encloses the blastocysts and this is referred to as implantation.

The inner layer of blastomeres in the blastocysts gives rise to the embryo.

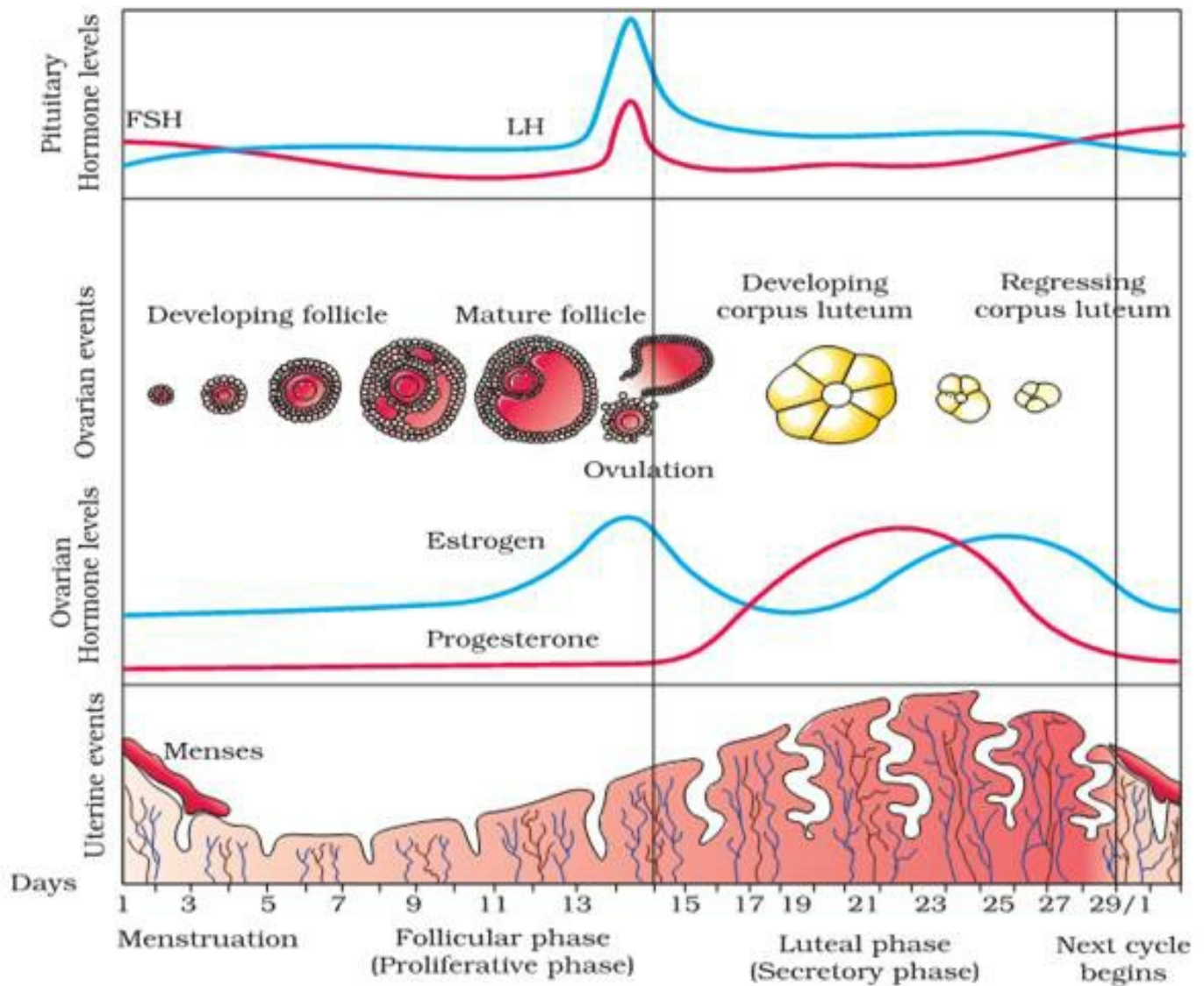


### **3. What is menstruation? What are the specific actions of FSH, LH, estrogen & progesterone in menstrual cycle?**

**Ans.** During menstrual phase of menstrual cycle which starts on 28th day the endometrial lining of female genital tract break down due to lack of progesterone As a result bleeding occurs. This monthly flow of blood is called menstruation.

During menstrual cycles, the various changes occur in the ovary under the influence of various hormones :-

1. Menstrual phase :- The levels of hormones LH, FSH, estrogen & progesterone are very less which results in breakdown of endometrial lining of uterus.
2. Follicular phase :- In this phase, the levels of pituitary hormones FSH & LH increase which causes ovarian hormone estrogen to be released. FSH controls the follicular phase, it stimulates the growth of follicles. Both FSH & LH reach their peak level in middle of cycle (14th day)
3. OVULATORY PHASE :- The level of LH hormone reaches its peak (called LH surge) induces the rupture of mature Graafian follicle & thereby release of ovum
4. Luteal phase :- The LH & FSH hormones begin to decline. After ovulation, the follicle becomes ruptured & is transformed into corpus luteum which secretes large quantities of progesterone



4. A woman has conceived & implantation has occurred within her uterus. Discuss the sequence of changes up to parturition which will take place within her body under the influence of various hormones.

**Ans.** The following changes takes place in the body of women after implantation :-



1. The trophoblast differentiates into two layers outer layer secretes enzymes to dissolve the endometrium of uterus.
2. The inner layer grows out as finger – like projections called chorionic villi into uterine stoma. The chorionic villi & the uterine tissue become inter digitated to form structural & functional unit called placenta.
3. Placenta secretes hormones like HCG, HPL , estrogen & progesterone that are necessary to maintain pregnancy
4. Umbilical cord, the structure that connects the placenta with the foetus is formed.
5. Simultaneously, inner cell mass differentiates into outer layer called ectoderm & inner layer called endoderm. & a middle layer called mesoderm appears between ectoderm & endoderm.
6. The primary germ layers give rise to all the tissues & organs of the adults e.g. after one month heart is formed & after second month digits & limbs are formed.
7. By the end of ninth month of pregnancy, foetus is completely developed & is ready for delivery.
8. During parturition, ovary secretes a hormone called relaxin that facilitates parturition which softens the connective tissue. Mild contraction called foetal ejection reflex is induced. This triggers release of oxytocin from posterior pituitary. Oxytocin induces stronger leads to expulsion of baby from uterus, through birth canal.

