UNIT-V

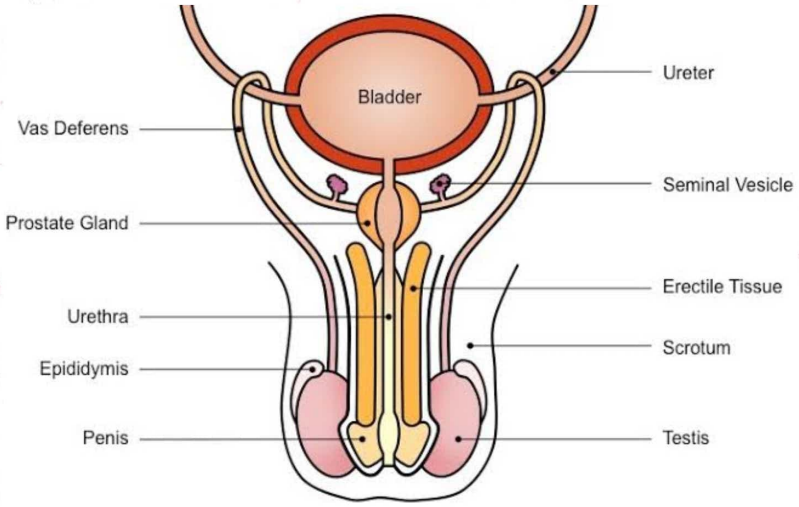
☆ Reproductive System :-

☆ Male reproductive System :-

The organs of male reproductive System can be Classified into.

#External genital organs
- penis Containing the urethra

#Internal genital Organs
- Testes
- vas deferens
- Seminal vesicles
- prostate gland
- Scrotum
- Ejaculatory duct



External genital organs :-

⊛ Penis :-

- It is the Copulatory organ and also Contains the terminal part of urethra.
- The parts of penis are.
  1. Corpora Cavernosa
  2. Corpora spongiosum (Contain the urethra)
  3. Glans penis (enlarged tip of penis)
  4. propuce (fold of skin Cover the glans penis)

Internal genital organs :-

① Testes :-

→ Testes are the Male reproductive organs which produce Spermatozoa.

→ The testes are two oval shaped bodies lying one on each side in the scrotum.

→ Each testis contains a number of tubules called Seminiferous tubules.

② Vas deferens (seminal duct) :-

- They are two in number one for each testis and begins from the epididymis at the upper end of testis.

③ Seminal vesicles :-

- They are two in number, each one lies at the side of the terminal parts of vas deferens and forms the ejaculatory duct.
- The function of Seminal vesicles is to produce a thick secretion which is added to the Spermatozoa during ejaculation.

④ prostate gland :-

- It lies below the bladder and it surrounds the first part of urethra
- It is pyramidal in shape, its base is directed above and the apex is directed downward.

(5) Scrotum :-

- The Scrotum is an outpouching of the lower part of the anterior abdominal wall.
- It Contain the testes, the epididymides, and the lower end of the Spermatic Cords.

(6) Ejaculatory ducts :-

- The two ejaculatory ducts are each less than 1 inch long and are formed by the union of the vas deferens and duct of the Seminal Vesicles.

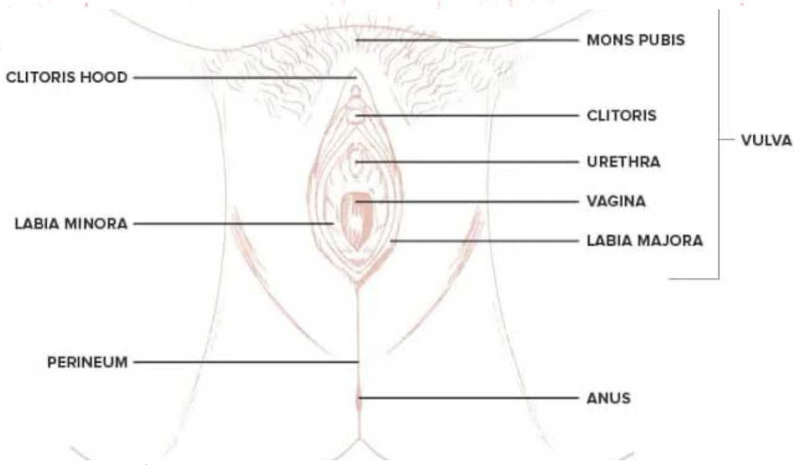
✱ Function of Male reproductive System :-

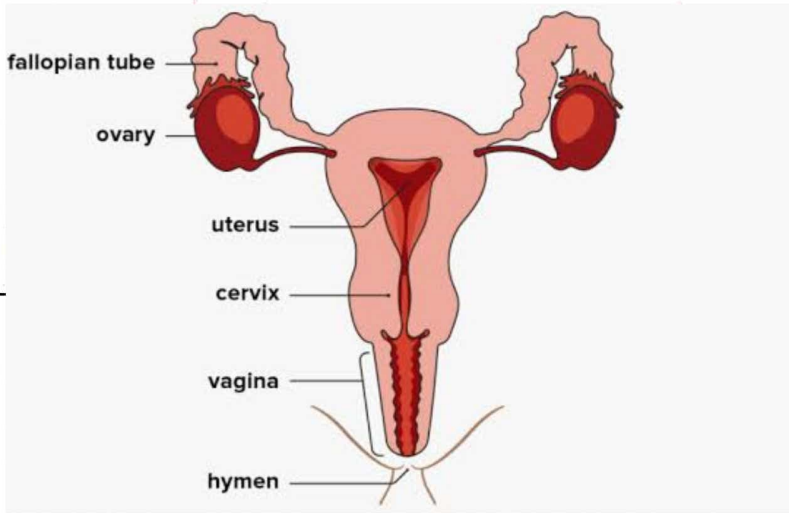
① Testis produce Sperm and testosterone.
② Epididymis matures and stores Sperms.
③ Sperm duct Carries Sperm from the epididymis to the Urethra.
④ Seminal vesicles, Cowper's gland and prostate gland produces Seminal fluid which feeds the Sperm and allow them to swim.
⑤ Urethra allowes the passage of either Urine or Sperm.
⑥ penis places Sperm inside the body of a female.
⑦ Scrotum keeps testes at a lower temperation 35°C this is the optimum temperature for Meosis to occur.

✡ Female Reproduction System :-

Female reproductive System Comprises of.

- External Genital (Vulva)
  - → Labia majora
  - → Labia minora
  - → Clitoris
  - → perineum
  - → Vestibular gland
- Internal Genital :-
  - → Fallopian tubes
  - → Uterus
  - → Cervix
  - → Vagina
  - → Ovaries
- Secondary Sexual Organs :-
  - → Breast
  - → mammary gland





① External Genital (Vulva) :-

The external genital are collectively called the Vulva that Consist of the following structure.

① Labia majora :-

- These are the two Large folds forming the boundary of the vulva.
- The are Composed of Skin, fibrous tissue and two bartholin's glands which helps Lubrication during intercourse.

② Labia Minora :-
- These are two Smaller folds of Skin blw the Labia Majora Containing numerous Sebaceous and eccrine Sweat gland

③ Clitoris :-
- The Clitoris Corresponds to the penis in the male and contains Sensory nerve ending and erectile tissue.

④ perineum :-
It is the area which extends from the fourchette to the anus.

② Internal Genital :-

① Two Uterine tubes (fallopian tube) :-
- The Uterine tube Serve as the Conduit of the oocyte from the ovary to the Uterus.

② Uterus (womb) :-
- It Lies in the pelvic Cavity, in between the rectum and urinary bladder.
- Uterus is a hollow muscular organ with a thik wall.
- It has a Central Cavity, which opens into Vagina through Cervix

③ Caervix :-
- It is the Lower Constricted part of Uterus.
- It is divided into two parts.

(3) (1) Upper Supra vaginal portion
(2) Lower Vaginal portion.

(4) Vagina :-

- It is a short tubular organ.
- It is lined by mucus membrane, which is formed by stratified epithilial cell.

(5) Ovaries :-

- They are Two in number and lie both of the Uterus.
- The ovaries Lie below the fallopian tube of each Side.

(3) Secondary Sexual Organs :-

(1) Breast or mammary glands :-

- The mammary gland is a gland located in the breasts of females that is responsible for Lactation, or the production of milk.

★ Functions of Female Reproductive System :-

→ Geminal epithelial cells of the ovary produce ova (oogenesis)
→ Fertilization takes place in the fallopian tube (oviduct).
→ After puberty the uterus goes through the menstrual cycle.
→ Implantation and prenatal growth take place in the Uterus.
→ The vagina receives the seminal fluid during Copulation.
→ parturition process of birth of child is also important function of the female reproductive System.
→ Mammary glands of the female Secrete milk after parturition.

✱ Sex hormones:-

Male Sex hormones:-

→ Interstitial Cells of the Testes Secrete Male Sex hormones which are Collectively Called the androgens.

→ Androgens Secreted by testes are:

- Testosterone
- Dihydrotestosterone
- Androstenedione

Among these three androgens, testosterone is Secreted in Large quantities. However, dihydrotestosterone is more active

Functions of male Sex hormones:-

1. Stimulation of Spermatogenesis
2. Growth of penis, scrotum and prostate.
3. Development of secondry sex characters.

Female Sex hormones :-

- Female Sex hormone, or Sex steroids, play vital roles in Sexual development, reproduction and general health.
- Sex hormone levels change over time, but Some of the most Significant change happen during puberty, pregnancy and Menopause.

- Ovary Secretes the female Sex hormones Estrogen and Progesterone.
- The majority of estrogen production occurs in the ovaries, the adrenal glands and fat cells produce small amounts of estrogen.
- The ovaries, adrenal glands, and placenta produce the hormone ~~pregnancy~~. Progesterone.

☆ Physiology of Menstruation :-

Introduction :-

- Menstrual Cycle is defined as Cyclic events that take place in a rhythmic fashion during the reproductive period of a woman's lifes.
- It starts at the age of 12 to 15 year which marks the onset of puberty.
- The Commencement of menstrual cycle is called Menarche
- Menstrual Cycle Ceases at the age of 45 to 50 years.
- permanent Cessation of menstrual Cycle in old age is Called Menopause.

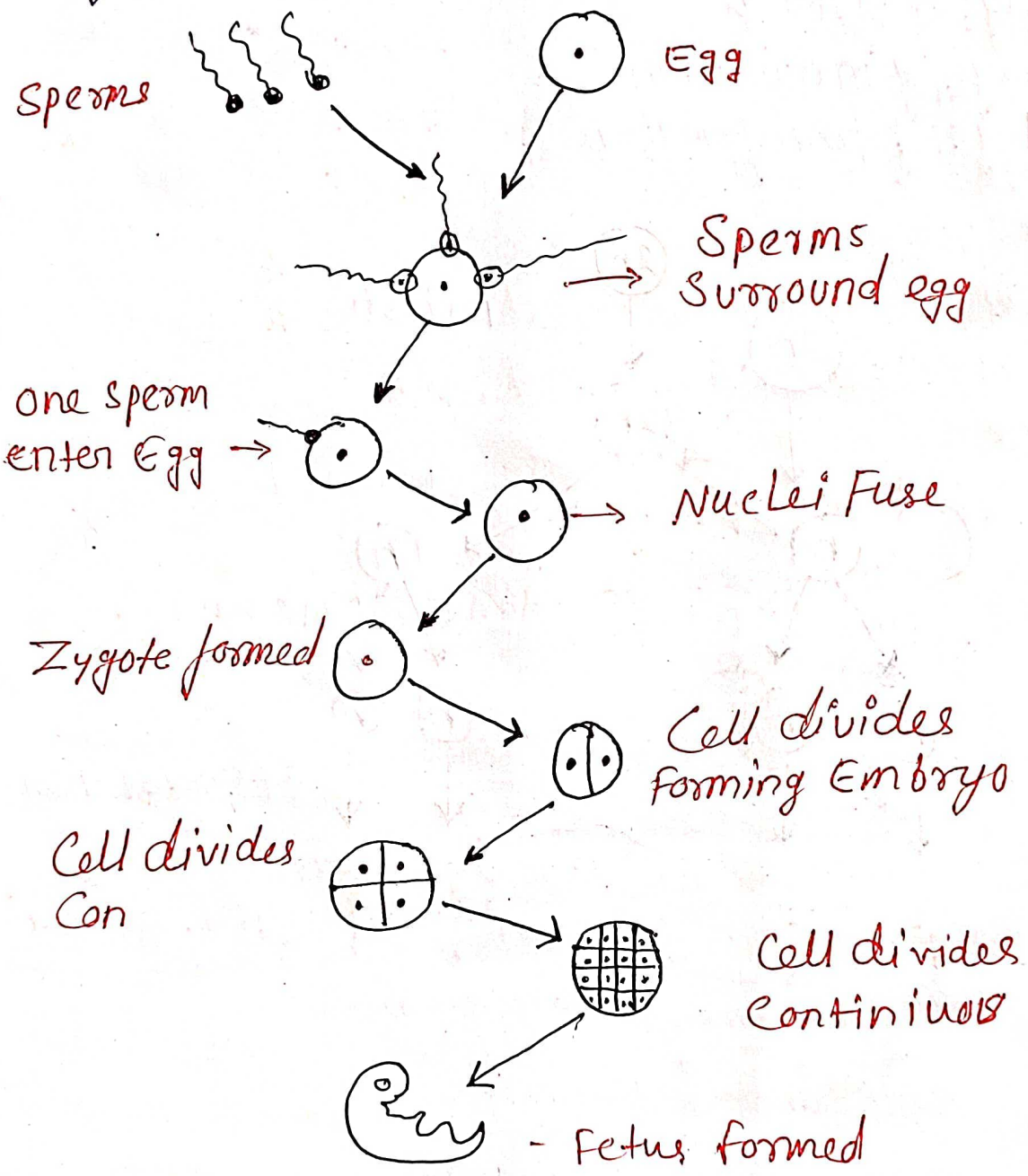
The menstrual Cycle Consist of following four phases.

① Menstrual Phase (Bleeding phase or menses)
② Follicular phase (proliferative phase.
③ Ovulatory phase

④ Luteal phase (Secretary

✱ Fertilization :-

Fertilization refers to fusion (union) of male and female gametes (sperm and ovum) to form a new offspring.

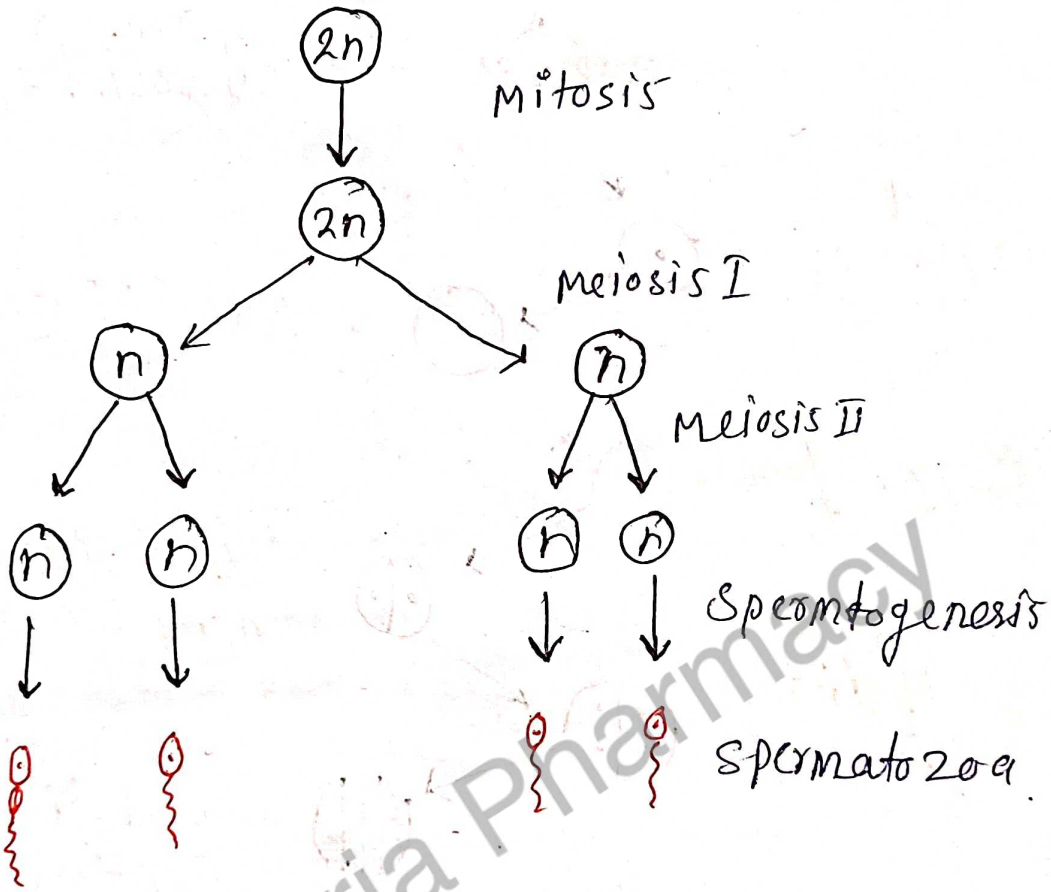


☆ Spermatogenesis :-

- It is the process by which the male gametes Called spermatozoa (sperm) are formed from the primitive spermatogenic Cells in the testis.
- It takes 74 day for the formation of sperm from a primitive germ Cells.

Stages of spermetogenesis four Stages -

1. Stage of proliferation
2. Stage of growth
3. Stage of maturation
4. Stage of transformation.



☆ OOGenesis:-

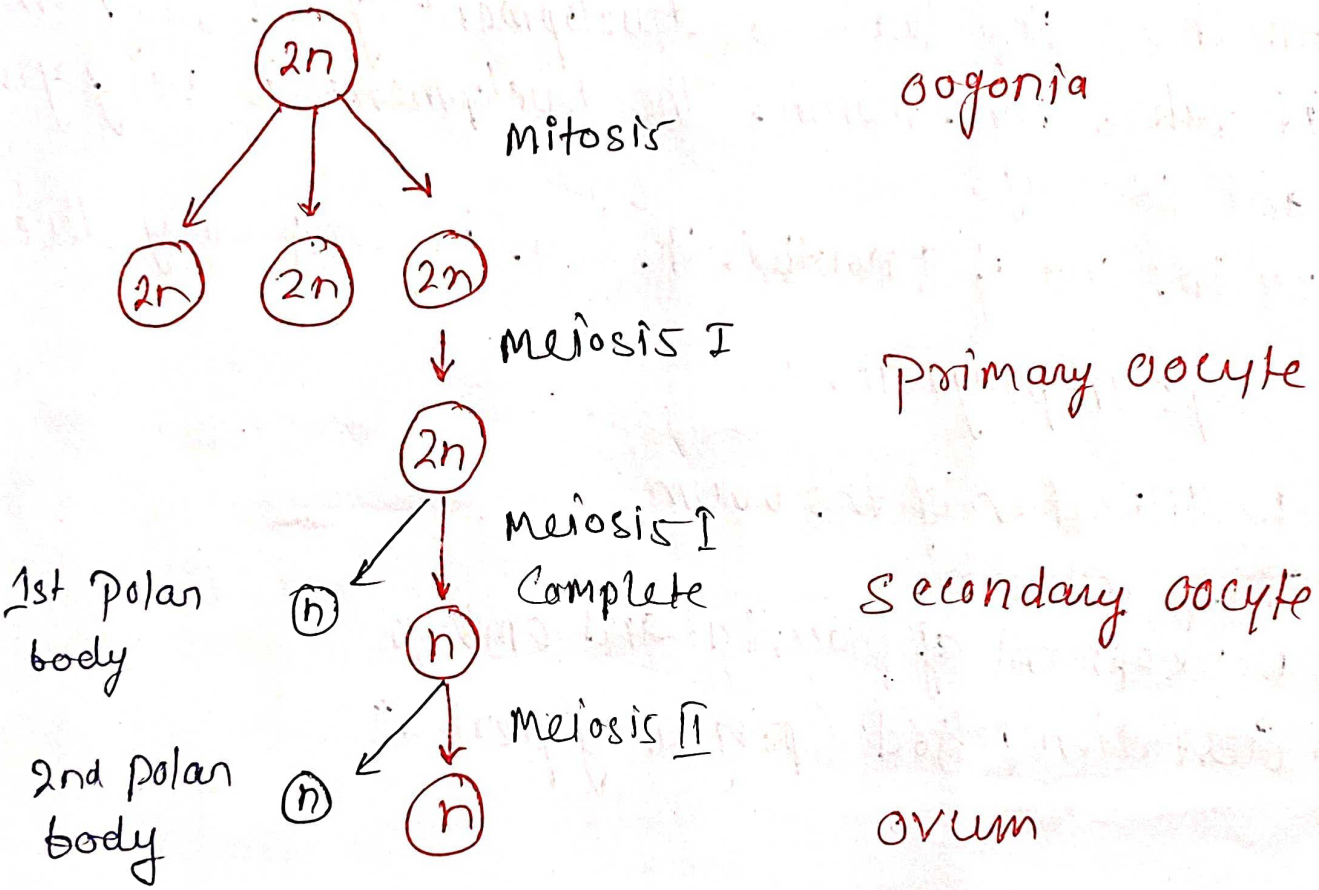
→ Oogenesis in the process of formation of female gametes. This process begins inside the fetus before birth.

→ The step in oogenesis up to the production of primary oocytes occur before birth.

→ primary oocytes do not divide further. They either become Secondry oocyte or degenerate.

→ Oogenesis occur in the outermost Layers of the ovaries.

→ oogenesis Starts with a germ Cell Called oogonium and undergoes mitosis to increase in number.



Pregnancy And parturition :-

Pregnancy :-

→ Pregnancy occurs when the Sperm fertilizes the egg and the Zygote is formed.

→ The Zygote gets implanted in the wall of the Uterus which needs nourishment and Care.

→ The Zygote develops into an embryo which further grows into a baby.

→ After implantation takes places, the embryo Startes Showing the triploblastic nature of human beings and developes the new organs.

- All these Step leads to development of the baby and it takes nine months. The development is very gradual and Steady.

→ By the end of 9 months, the fetus is Completely developed.

Steps in pregnancy :-

1. Fertilization of the ovum
2. Implantation
3. Development of placenta and embryo
4. Gestation period (pregnancy period)

Parturition :-

- Parturition is the expulsion or delivery of the fetus from the Mother's body.
- It occur at the end of pregnancy.
- The process by which the delivery of fetus occurs is called Labor. It Involves various activites Such as Contraction of uterus, dilation of cervix and opening of vaginal Canal.

Stage of parturition :- Three steps

① First Stage :-

- The Strong Uterine Contraction Called Labour Contraction begins.
- Labor Contraction arise from fundus of uterus and move downwards which results in dilation of cervix and opening of vaginal Canal.

② Second Stage :-

- In this Stage, the fetus is delivered out from uterus through Cervix and vaginal Canal.
- This Stage Lasts for about 1 hour.

③ Third Stage :-

- During this Stage the placenta is detached from the decidua and is expelled out from uterus.
- It occur within 10 to 15 minutes after the delivery of the Child.

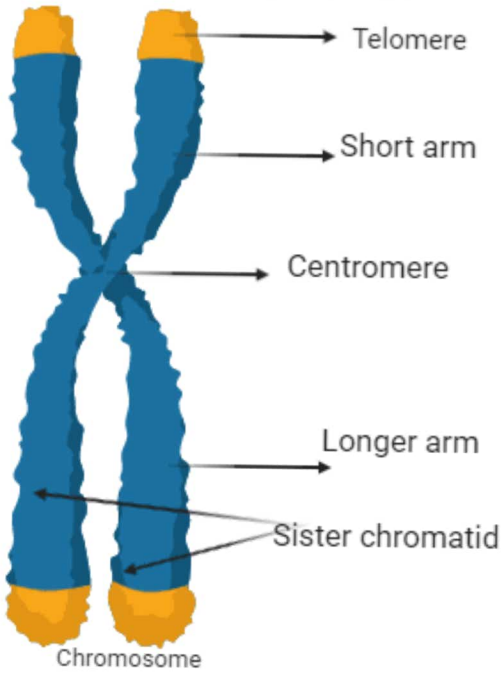
Introduction to Genetics :-

① Chromosomes :-

The term Chromosomes comes from the Greek words for Colour (Chroma) and body (soma) because of the ability to Stained by some Colourful dyes used in research.

- Chromosomes are thread-like structure located inside the nucleus of animal and plant cells.

Structure of Chromosomes :-



- Chromosome is the rod-Shaped nuclear structure that Carries a Complete blueprint of all the hereditary characteristics of that Species.
- A chromosome is formed from a Single DNA molecule Coiled around histone Molecules.
- Each DNA Contains many gens.
- All the dividing Cells of the body except reproductive Cells Contain 23 pair of chromosomes.
- Each pair Consist of one chromosome inherited from Mother and one from father.
- The reproductive cells Called gametes or Sex Cells Contain only 23 Single Chromosomes.

★ Gens & DNA :-

DNA - Deoxyribonucleic acid :-

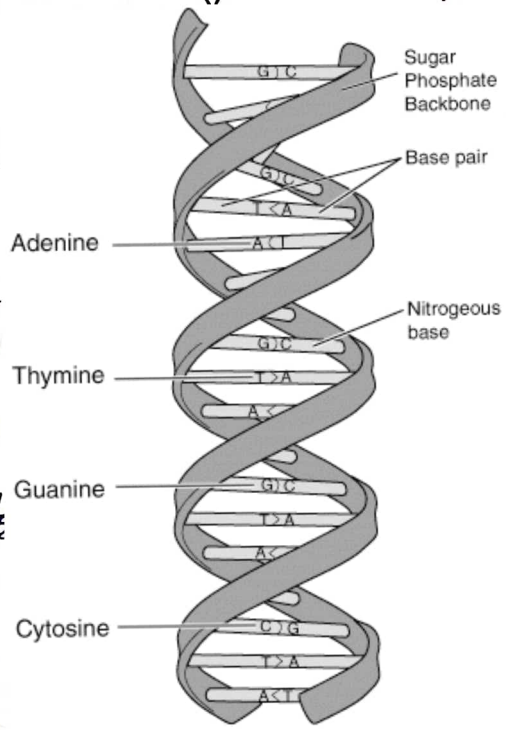
→ DNA is a nucleic acid that carries the genetic informatio to the offspring of an organism.

→ DNA forms the chemical basis of hereditary characters.

→ It contains the instruction for the synthesis of proteins in the ribosomes.

→ Gene is a part of a DNA molecule

→ DNA is present in the nucleus.



→ The DNA present in the nucleus is responsible for the formation of RNA.

→ RNA regulates the synthesis of protein by ribosomes.

→ DNA in mitochondria is called non-chromosomal DNA

Structure of DNA :-

- DNA is a double Standard Complex nucleic acid. formed by deoxy ribose, phosphoric acid and four types of base.

- purins : Adenine (A); Guanin (G)

- pyrimidines : Thymine (T) — Cytosin (C)

Protein Synthesis :-

→ Protein Synthesis is the process of Creating protein Molecules.

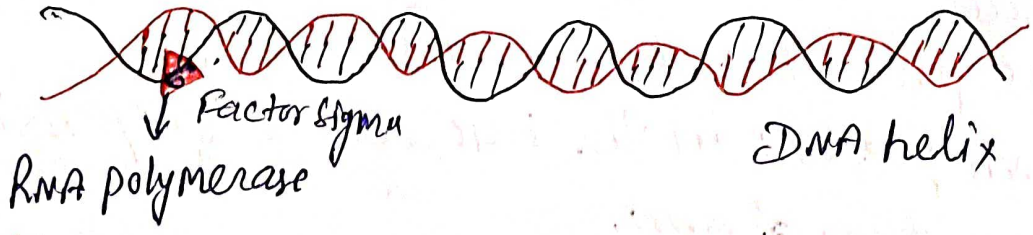
→ In biological system, it involves amino acid Synthesis transcription, translation and post-translational event

Steps of Protein Synthesis :-

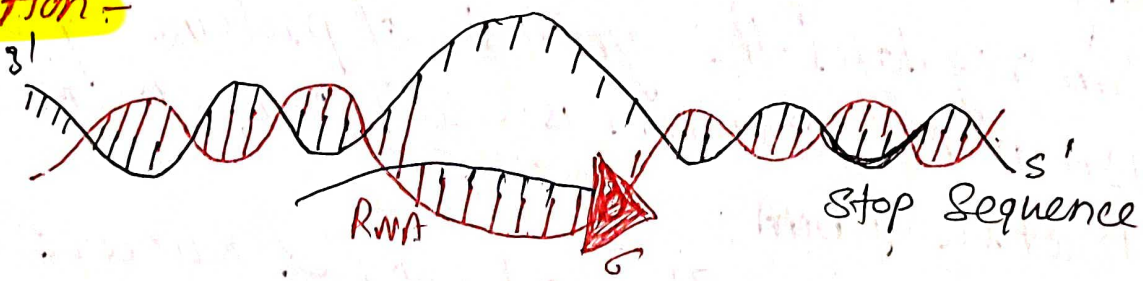
① Transcription :-

- Transcription or RNA Synthesis, is the process of Creating an equivalent RNA Copy of a sequence of DNA.

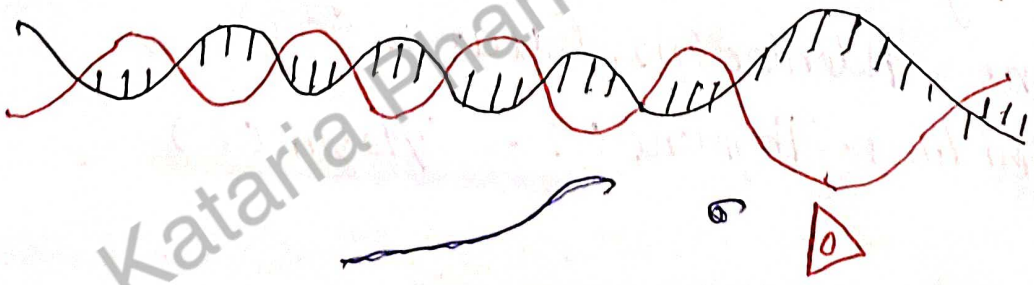
(i) Initiation :-



(ii) Elongation :-



(iii) Termination :-



★ Genetic pattern of inheritance :-

→ Inheritance is the passage of hereditary traits from one generation to the next.

→ It is the process by which we acquired our Characteristics from parents.

→ The branch of biology that deals with inheritance. is Called genetics.

→ The area of health Care the offers advice on genetic problems is Called genetic counseling.

#Some definations :-

① **Mutation :-**

A Mutation is a permanent heritable Change in allele that produce a different variant of the Same trait.

② **Genotype :-**

It refer a particular gene or set of gene which are Carried by an individual.

- Genotype of an individual ists Complete heritable genetic identity. which is unique to an organism or individual.

③ **phenotype :-**

- phenotype refers to how the genetic makeup is expression ~~of a gene~~ in the body.
- It is the physical or outward expression of a gene.