HUMAN REPRODUCTIVE SYSTEM

- Anatomy of male and female reproductive system
- function of male and female reproductive system
- Sex harmones
- Physiology of menstruation
- fertilization
- Spermatogenesis
- Oogenesis
- Pregnancy and parturition.

It is also known as sexual reproductive system. It involves internal fertilization by sexual intercourse. The male inserts their penis into female's vagina and ejaculate semen inside the vagina. The semen contain sperm. few strong sperm are passes trough the vemin inside the uterus and then into the fallopian tubes for ovum fertilization.

Parts of female Reproduction System

The female reproduction system involves the following organs like ovary (ovaries), fallopian tubes, uterus and vagina.

1) Ovary ⇒ The ovaries are small oval shaped pair of organs. They are situated in lower part of abdominal cavity which produce ova. The ova start maturing during puberty stage of female, every 28 days, an ovum is released from the ovary and taken up by a thin fallopian tube through its funnel shapped opening. The ovum is passed down the

duct to the uterus and finally passes through the vagina.

2) Fallopian tube ⇒ The fallopian tubes are also known as oviducts. They are a pair of thin tubes that comes from the ovaries to the uterus. Each fallopin tubes has a funnel shaped opening near the ovary. It is lined by civia that helps the ovum to fall down into the fallopian tube and into the uterus through its movement.

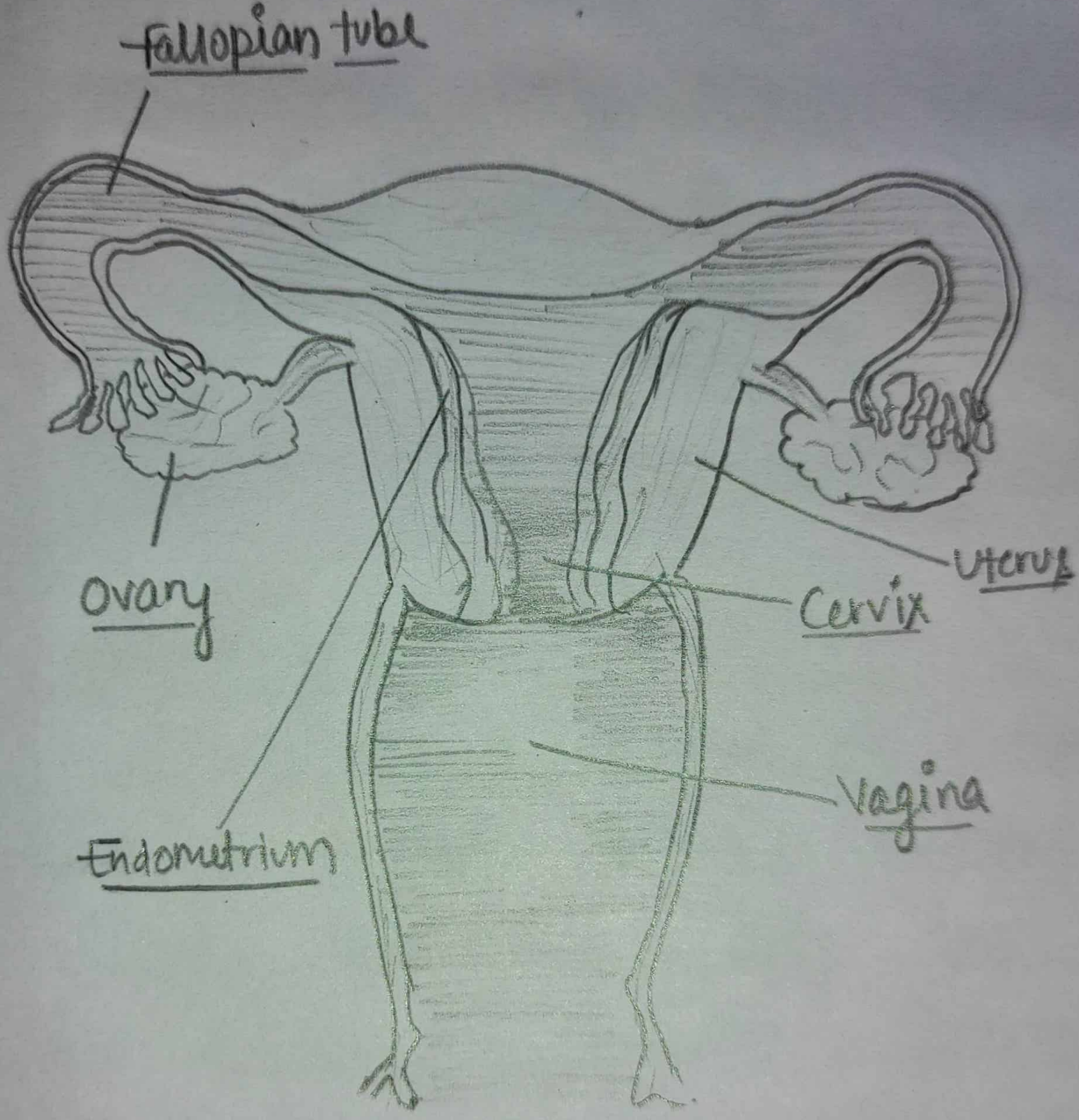
3) Uterus ⇒ The uterus locally known as womb, is a hollow, pear-shaped, elastic muscular funel organ. Its upper portion is wider where fallopian tubes enter whereas the lower portion of the tube is known as urvin which is consists of muscles, the uterus open into vagina through the corvin.

4) Vagina ⇒ The vagina is a tube that opens to the outside of the body through an opening called valva. In this organ the penis is inserted during intercourse. for the discharge of sperms through the passage, the fully developed body is also born.
It is located b/w urinary bladder and the rectum.

A) Fertilization ⇒
This is a method or process through which sperm enter into the ovum when semen is discharged in vagina during sexual intercourse. Only one sey sperm enter the ovum because most of the sperm die which caring to the fallopian tubes. A sperm can remain alive in the fallopian tube for about 12 hours and during this time sperm enter's into the ovum.

B) Implantation:

After fertilization, the fertilized egg moves down the fallopian tube and continvosly undergoes cell division. fertilized eggs are called zygote. During cell division zygote forms a holbw ball of cells which is known as embryo. The embryo gets embeded slowly in the wall of the uterus by mean of thick muscles gland and a large number of blood capillaries. The total period a from the time of fertilization to embryonic development is known as gestation period. It is around 280 days (9 month) for humans.



- FEMALE REPRODUCTIVE SYSTEM

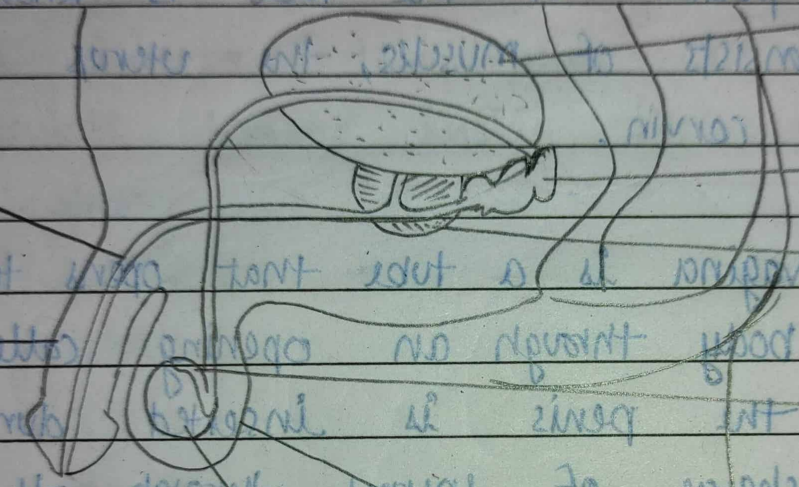
- Parts of Male Reproduction System

The male reproductive system includes the following organs like testes, suminal vesicles, penis and prostage gland. fig. 1.

1) Testis → It is the most imp. part of male reproductive system organ which produces sperms, they are two in number and an oval shaped. They are situated in a protative bag called secrotum which is sac like structure lying outside the abdominal cavity. The secrotum can elongate and contract based upon, the body temp and external temperature. Sperm formation occurs at a temp lower than normal body temperature. the seminal vesicle is an elongated sac at the base of the urinary bladder which store sperms.

2) Prostate gland → The sperms duct from both sides join near the base of the urinary bladder, opening into a single tube called urethra. This junction occur inside the prostate gland which secrete the seminal fluid. The urethra cover to the outside of the body through an organ called penis. It caries both urine and seminal fluid.

3) Penis → The penis is a muscular and tubular organ made up of loose tissue with spaces in between which is called irrectile tissue. During stimulation, the erectile tissue is filled up with blood, making the penis erect and firm which helps penis to enter inside the vagina of the female and discharge the semen.



- MALE REPRODUCTIVE SYSTEM

Fig: Nord

4) Sperm → The semen contain sperm which is the male gamete. It has a head and a long tail. The tail helps sperms to swim towards the ovum for fertilization.

- Spermatogenesis and Oogenesis

Spermatogenesis and Oogenesis are together know as Gametogenesis in which a diploid gamete cell produce haploid sperm and egg cells, irrespectively.

- **Spermatogenesis →**

It is the process in which spermatozoa a sperm cells are produced from spermatogonial stem cells by mitosis and meiosis process. Spermatozoa are the mature male gametes and hence spermatogenesis is the male of gamatogenesis. In mammals occurs in the seminiferous tubules of the male testis in a stepwise process which is essential for sexual reproduction.

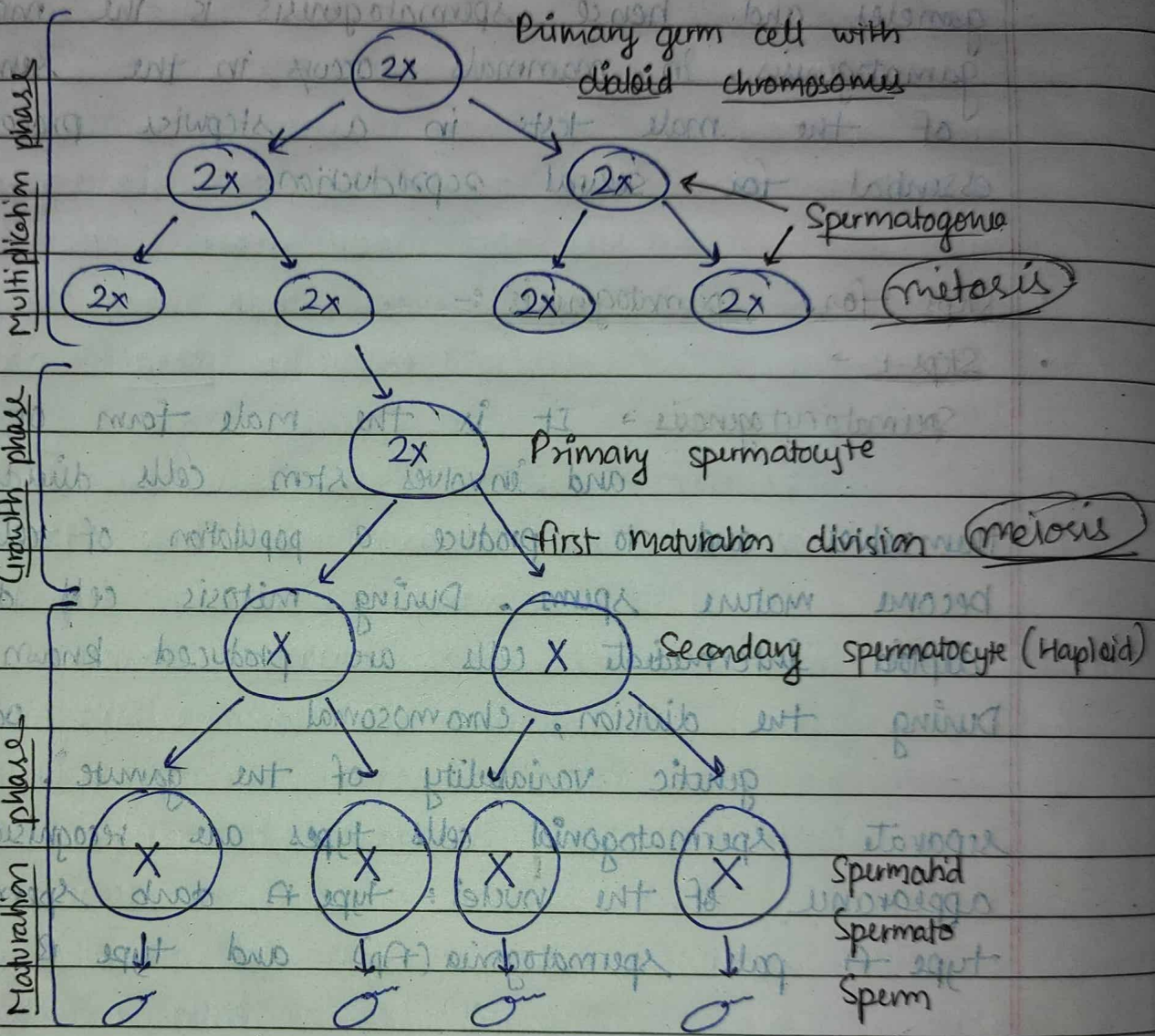
- **Steps for spermatogenesis :-**
- **Steps-1 →**

Spermatocytogenesis → It is the male form of gametocytogenis and involves stem cells divides to replace themselves and to produce a population of cells destined to become mature sperm. During mitosis cell division, two diploid intermediate cells are produced known as spermocytes. During the division, chromosomal occur and the genetic variability of the gamete. functionally separate spermatogonial cells types are recognised based on the appearance of the nuclei :- type A dark spermatogenis (Ad), type A pale spermatogonia (Ap) and type B spermatogonia B.

- **Step-2 Spermatidogenesis :-** The production from secondary spermatocytes produced earlier rapidly enter meiosis II and divides to produce haploid spermatide.

- **Step-3 Spermogenesis →** At this stage each spermatid become mature. Sperm cells grown with proper head with a tail and develop a thickened mid piece where the mitochondria gather.

and form an one of the centrioles of the cells elongates to become the tail of the sperm.



- Oogenis ⇒ It is the process by which the female gametes or ova are formed into the ovaries the females gametes is called an ovum. Stages of oogenisis are discussed following:

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Stage 1 → Multiplication phase → The primordial germinal cells divide repeatedly to form the oogonia a egg which are further multiply by the mitosis division and form the primary oocytes. There oocytes pass thrargh the growth phase.

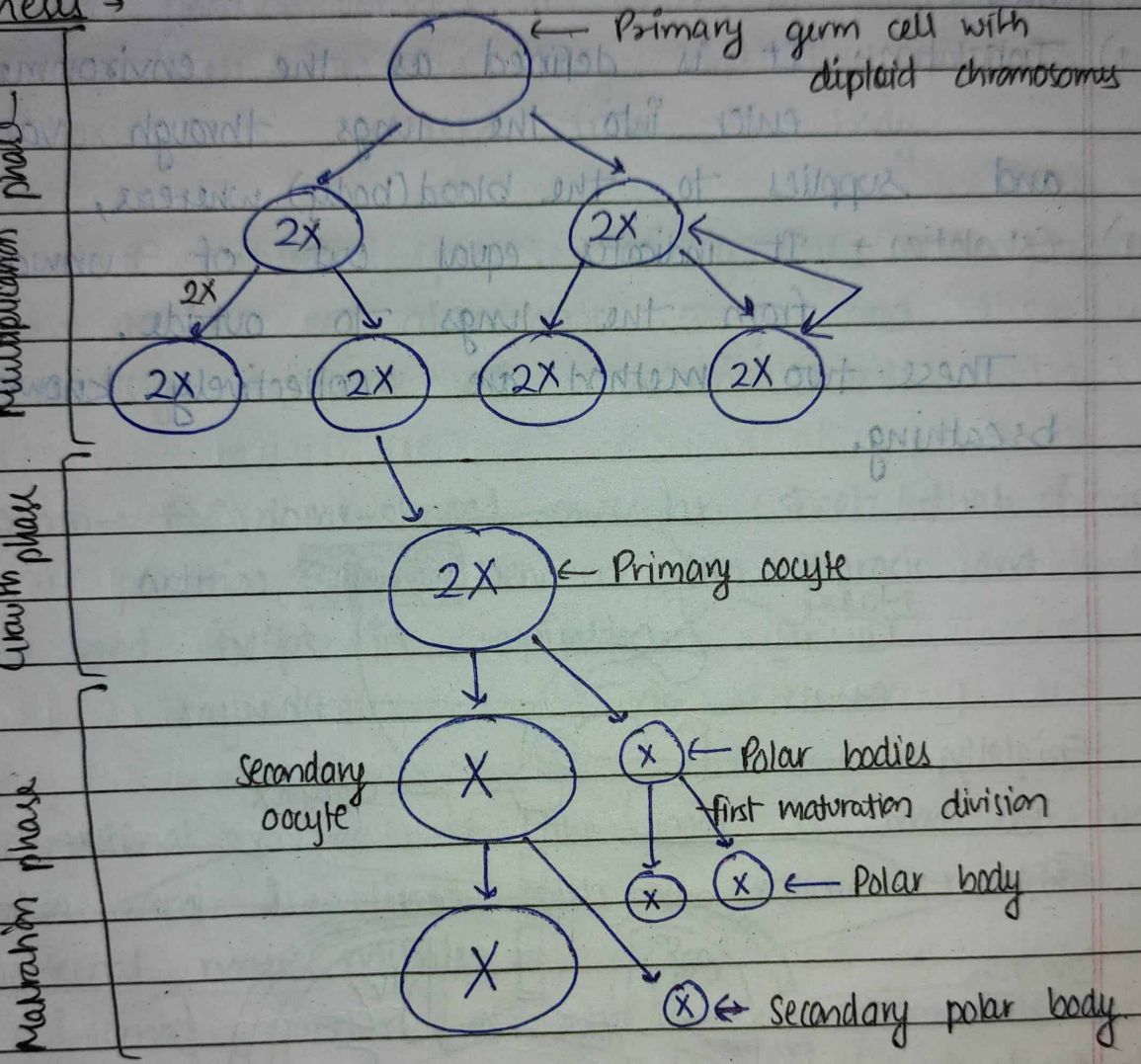
Stage 2 → Growth phase → The growth phase of the oogenesis is much longer than spermatogenesis. During this stage the size of the primary oocyte increase enormously. During the growth phase, lot of change occurs in the of the primary oocyte.

Stage 3 → Maturation phase →

i) first maturation phase → During the first maturation division or Meiosis-I, the homologus chromosome of the synaker, duplion chiasma formation and crossing over. Then the nuclear membrane breakes and the bivalent chromosome move towards the appoite pole due to contraction of chromosomes fibres.

ii) Second maturation phase → Secondary oocyte then enters into the second maturation stage or meiosis II, where haploid secondary oocyte forms. Mature egg and a second polar body.

⇒ **Oogenesis →**


Multiplication phase
Growth phase
Maturation phase
← Primary germ cell with diploid chromosomes
2X
2X
2X
2X
2X
2X
2X
2X
2X ← Primary oocyte
Secondary oocyte
X
X ← Polar bodies
first maturation division
X
X ← Polar body
X
X ← Secondary polar body

- Menstrual cycle

The menstrual cycle is the regular natural change that occurs in the female reproduction system and makes pregnancy possible the cycle is required for the production of ovacytes and for the preperation of the uterus for pregnancy. It is a cyclic phase of the blood flow from the uterus of female at monthly interval. It occurs an average of 28 day and stay 4-5 days. It starts at the age of puberty and stop at the age of stage (around 45-50 years of age).

Phase of menstrual cycle.

It has four phases like menstrual phase, proliferrac phase, ovulation and secretive phase.

i) During menstrual phase, the endometrium sheds blood and mucus passes out through vagina for duration of 3-5 days.

ii) During prolifuration phase, the proliferation of endometrium takes place. In this phase the estrogen level are increased with which helps in prolification. Hence this phase is also known as estrous phase. The duration of this phase is about 10-14 days.

iii) Before 14 days of start of menstruation, there is a sudden increase in fsh and LH harmone levels which helps in riptune of graffian folicle. This liberates an ovum which is known as ovulation phase.

iv) After ovulation, the endometrium become more secretive under the influence of progesterane. Hence this phase is also known as progestone phase or secretive phase. In this stage both

the estrogen and progesterone level are high and corpus is formed from the rupture of graffin follicle. The duration of this phase is 14 days.

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