The Reproductive System

Reproduction is the formation of new individuals by sexual or asexual means which can repeat the process on their own.

Patterns of Reproduction

Asexual Reproduction

- Involves reproduction through any part of the body. Male and female gametes are absent.
- It is a simple process of cell division.

Eg: Binary fission in amoeba, budding in Hydra.

Sexual Reproduction

- Involves the fusion of male and female gametes.
- The fusion of male and female gamete form a zygote from which develops a new individual. This process is known as fertilisation.

Eg: Reproduction in multicellular organisms.

Secondary Sexual characters.

(2)

Males and females show outwardly differentiating features called secondary sexual characters.

Males	Females
• Distribution of hairs on the body and face (Beard and moustache). • Muscularity and Strong Built. • Deep voice.	• Breasts in females. • feminity and larger hips. • High pitch voice.

Reproduction in Humans.

• **Male reproductive system**: The male reproductive system consist of the following organs:

1. Testes	Location of Testes	• Pair of oval glands located in a thin-walled sac called scrotum located outside the body cavity. • The scrotal sac is suspended outside the body. Its temperature is 2-3 degree Celsius lower than the body Temperature. • In abnormal conditions, when the testes do not descend into the scrotum, it results in sterility i.e incapability of producing sperms.

Structure of Testis	Each Testis in encased in a capsule. The capsule is internally divided into 15-20 lobules. Each lobule contains seminiferous tubules.
Seminiferous tubules	Sperms are produced in the seminiferous tubules by the process of spermatogenesis.
Interstitial cells (Leydig cells)	They produce the male hormon i.e testosterone.
Epididymis	• The sperm from the seminiferous tubules pass into 12-14 efferent-ducts. • These ducts further join to form the epididymis. • The epididymis stores the sperms when they mature
Vas deferens (sperm duct)	It is about 45 cm long. The two vas deferens loop over the ureters and join the urethra. Hernia: Due to pressure of the abdomen, the intestines bulges into the scrotum through the inguinal canal.

Ejaculatory duct		• The vas deferens and the seminal vesicles unite to form the ejaculatory duct. • It ejects the sperms into the urethra just before the ejaculation
Accessory Gland	Seminal vesicles	• A pair of lobulated glands • Produce an alkaline fluid. It constitute about 60% of the total volume of semen.
	Prostate gland	• It is a biloted structure. • It pours an alkaline secretion into the semen. This secretion constitute about 13-33% of the semen.
	Bulbo-urethral gland (cowper's gland.)	Two small ovoid glands. Its secretion serves as a lubricant.
Penis		It is the passage for both urine and semen. It is highly vascular organ with erectile tissues and vascular spaces. Under the influence of sexual stimulation, blood flows in large amount to the vascular spaces of the penis which makes it erect. Such condition is called erection.

Semen: It is the mixture of sperms and secretions from the prostate and cowper's gland. It is a milky fluid.

female Reproductive system

Ovaries	: Two ovaries are present in the pelvic cavity on each side of the uterus. Ovaries produce ova by the process of oogenesis.
Oviducts	: The two oviducts or fallopian tubes are 12cm long and attached to the lateral ends of the ovaries. • The open distal end of the ducts is funnel shaped and called oviduct funnel, infundibulum or ostium. The infundibulum has finger like projections called fimbriae which help to push the release ovum into the oviduct.
Uterus	: • It is a hollow pear shaped muscular organ. • The internal wall of the uterus is lined by tissue layers. The innermost layer is called endothelium which is lined by ciliated epithelium. • It protects and nourishes the developing embryo.

Vagina	: It is a muscular tube about 10-15cm long. It extends from cervix to the outside. It receives the male penis during copulation. It also serves as the passage during childbirth.
Vulva	: It is the external female genitalia. It contains independent openings of urethra and vagina.

Ovulation : Ovulation is the release of the mature ovum by the rupture of the graafian follicle. The graafian follicle bursts and release the ovum into the infundibulum of the fallopian tubes.

- The corpus luteum is an endocrine tissues. It secretes two hormones
- Oestrogen : This hormone is secreted by the follicle before ovulation.
- Progesterone : It prepares the uterus for the implantation of the embryo.

Menstrual Cycle : The reproductive period of the human female starts from about 13 years and continues till about 45-50 years. This period is marked by a characteristic even repeated almost every month. It is called menstrual cycle.

Menstrual cycle: It lasts for 3-5 days. During this phase, the blood is discharged.

Follicular phase: As the follicle grows, it finally matures into the graafian follicle. Oestrogen stimulates the thickening of the uterine endometrium.

Ovulatory Phase: On about the 13th or 14th day, the follicle ruptures and the released ovum travels down, the fallopian tube.

Luteal Phase: It lasts for 15-28 days. The uterus lining thicken further. Empty follicle turns into corpus luteum. The corpus luteum secretes oestrogen and progesterone. If fertilisation does not occur, then the ovum disintegrates and the endometrial lining starts shedding on 28th day.

- If fertilisation occurs, then the embryo gets implanted in the uterine wall and there is no menstrual flow.

- The placenta does not allow the entry of germs from the mother to the foetus, but viruses (eg HIV) can pass through the placenta if the mother is already infected.
- The placenta secretes the hormones oestrogen and progesterone.

Functions of Placenta

1. From mother to foetus: Oxygen, Amino acids, Vitamins, minerals, fats and lipids.
2. From foetus to mother: Carbon-dioxide, urea and waste products.

Amnion: It is a sac which develops around the embryo even before the formation of allantois.
- The amniotic fluid fills the space between the amnion and embryo.
- The amniotic fluid protects the embryo from physical damage by jerks and mechanical shocks.

Parturition

- The full term of the development of an embryo in the uterus is called gestation.
- In humans, it lasts for about 280 days.
- At the time of birth, the baby is pushed out by contractions of the muscles of the uterus.
- After sometime, the umbilical cord shrinks and can be tied and cut.
- After about 15 minutes, the placenta breaks from the uterus