## 3. Life processes in living organisms Part: 2

### 1. Complete the following chart

| Asexual reproduction | Sexual reproduction |
|---|---|
| 1. Reproduction that occurs with the help of somatic cells is called asexual reproduction. | 1. Reproduction that occurs due to fertilization of gametes is called sexual reproduction. |
| 2. For asexual reproduction only one parent is necessary. | 2. Male and female reproduction parent are necessary for sexual |
| 3. This reproduction occurs with the help of mitosis only. | 3. This reproduction occurs with the help of both mitosis and meiosis. |
| 4. New individual formed by this method is genetically identical with parents. Asexual reproduction occurs in different. | 4. New individual formed by this method is genetically different from parents. |
| 5. Individuals by various methods like binary fission, multiple fission, budding, fragmentation, regeneration, vegetative propagation, spore production, etc. | 5. Sexual reproduction occurs in two steps: First formation of haploid gametes by meiosis and then fertilization of these haploid gametes to form diploid zygote. There are no subtypes in the sexual reproduction. |

### 2. Fill in the blanks

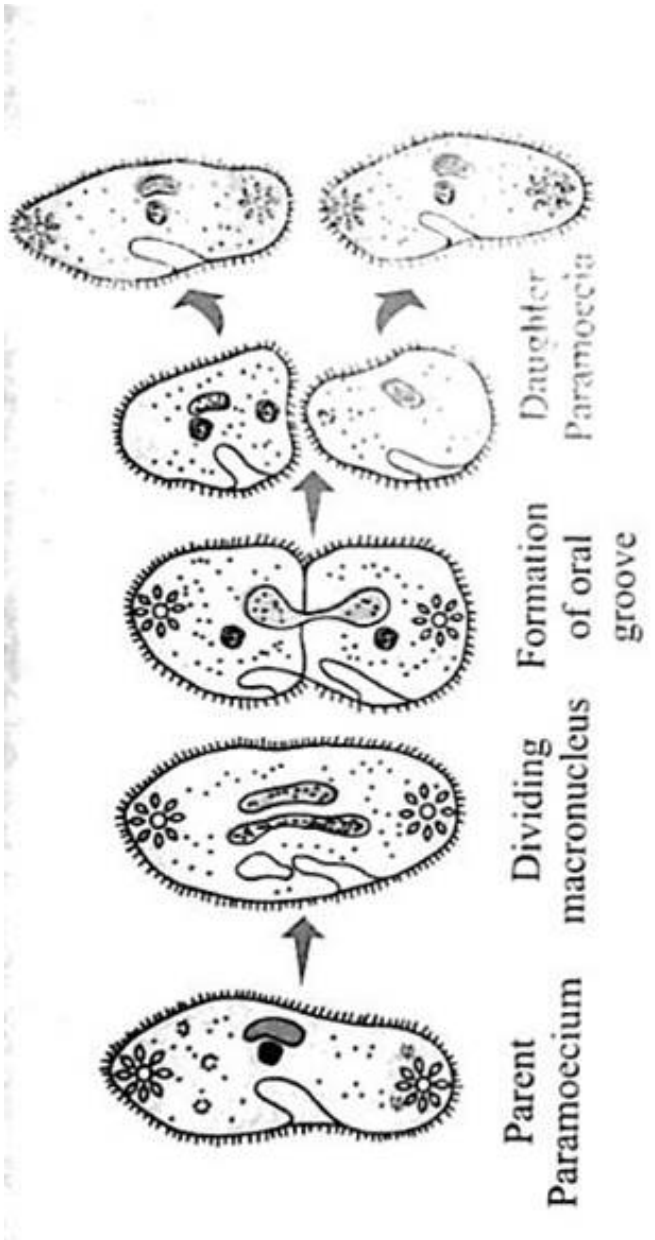
(1) In humans, sperm production occurs in the organ **testis.**
(2) In humans, **Y chromosome** is responsible for maleness.
(3) In male and female reproductive system of human, **no answer** gland is same.
(4) Implantation of embryo occurs in **uterus.**
(5) **Asexual** type of reproduction occurs without fusion of gametes.
(6) Body breaks up into several fragments and each fragment starts to live as a new individual. This is **fragmentation (asexual)** type of reproduction.
(7) Pollen grains are formed by **meiotic** division in locules of anthers.

### 3. Complete the paragraph with the help of words given in the bracket.

Growth of follicles present in the ovary occurs under the effect of **follicle stimulating hormone**. This follicle secretes estrogen. **Ovarian follicle along with oocyte** grows / regenerates under the effect of estrogen. Under the effect of **Luteinizing hormone**, fully grown up follicle burst, ovulation occurs and **corpus luteum** is formed from remaining part of follicle. It secretes **estrogen** and **progesterone**. Under the effect of these hormones, glands of **endometrium of uterus** are activated and it becomes ready for implantation

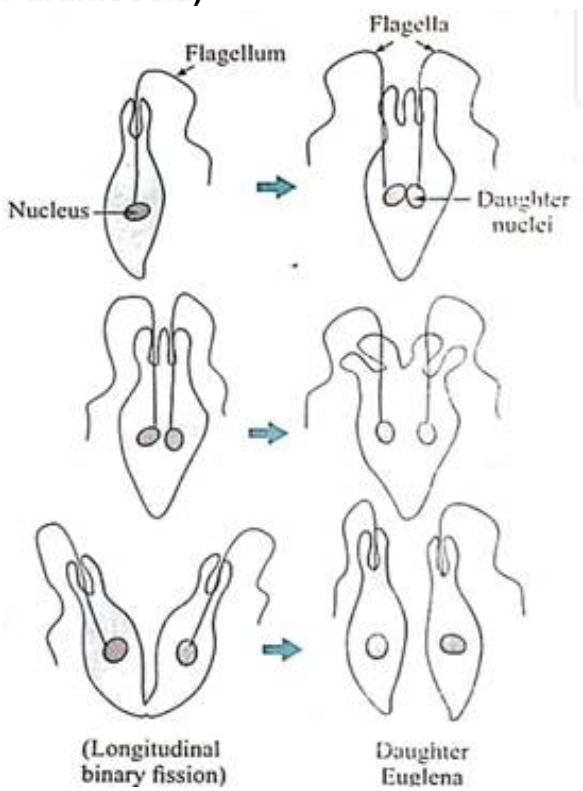
### 4. Answer the following questions in short.

**1. Explain with examples types of asexual reproduction in unicellular organism.**
**Ans. (Rotate your phone)**




(*in case image is not visible enough*)
**(Parent Paramoecium à Dividing maraonucleus à Formation oral grove à Daughter**

**Paramoecia)**




There are different methods of asexual reproduction in different unicellular animals.

**(1) Binary fission:** The process in which the parent cell divides to form two similar daughter cells is binary fission. It takes place either by mitosis or amitosis. When there are favourable conditions and abundant food supply then the organisms undergo binary fission. Prokaryotes, Protists and eukaryotic cell-organelle like mitochondria and chloroplasts perform binary fission.

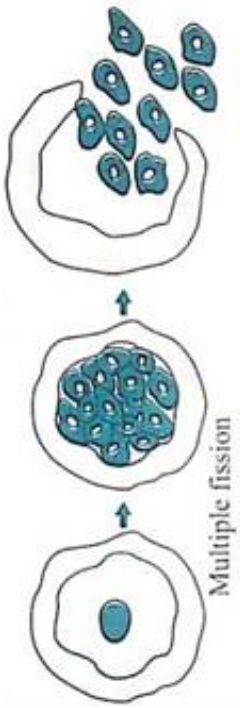
Based on axis of fission there are three subtypes of binary fission.

**(a) Simple binary fission**: The plane of division is not definite, it can be in any direction due to lack of specific shape as in Amoeba.

**(b) Transverse binary fission:** The plane of division is transverse, as in Paramoecium.

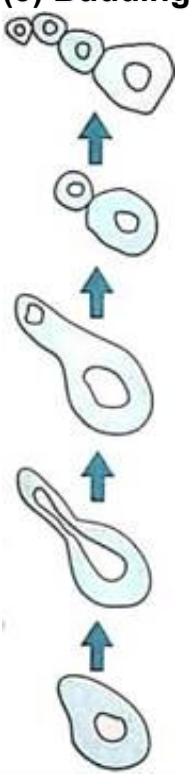
**(c) Longitudinal binary fission:** The plane of division is in lengthwise direction as in Euglena.

**(2) Multiple fission: (Rotate your phone)**




During unfavourable conditions when there is lack of food, multiple fission is shown by amoeba. Amoeba forms protective covering and becomes encysted. Inside the cyst, amoeba undergoes repeated nuclear division. This is followed by cytoplasmic divisions. Many amoebulae are formed which remain dormant inside the cyst. When favourable conditions reappear, they come out by breaking the cyst.

**(3) Budding in yeast: (Rotate your phone)**



Yeast is unicellular fungus that performs budding. The parent cell produces two daughter nuclei by mitotic division. This results in a small bulging bud on the surface of parent cell. One daughter nucleus enters the bud. It then grows and upon becoming big it separates from the parent cell to have independent life as new yeast cell.

**(2) Explain the concept of IVF.**
**Ans.** (1) IVF means In Vitro Fertilization (IVF)
(2) This is the technique in the modern medical field where childless couples can be blessed by their own child
(3) IVF technique is used for childless couples who are faced with problems such as less sperm count, obstacles in oviduct, etc.
(4) The IVF technique is done by removing the oocyte from the mother and artificially fertilizing by the sperms collected from father. This fertilization is done in a test-tube. Thus it is also called test tube baby. The embryo formed is implanted in uterus of real mother or a surrogate mother at appropriate time.

**(3) Which precautions will you follow to maintain the reproductive health?**
**Ans.** The reproductive system is one of the organ system in the body just like the other systems. Therefore, about reproductive health one should have scientific and authentic information. The cleanliness of body is very essential but keeping the mind clean is also important to maintain good reproductive health. One should be careful about sexual relationships. These things should not be experimented in young age. Mistakes committed like this can change the sexual health forever. The cleanliness and hygiene during menstruation, the cleanliness of genitals and other private parts are the aspects of personal hygiene. When living in a society, one should always be away from cross infections of venereal type.

**(4) What is menstrual cycle? Describe it i brief.**
**Ans.** (1) Menstrual cycle is the events of cycle changes that takes place with the interval of 28 to 30 days in mature woman.
(2) Hormones from pituitary, FSH (Follicle Stimulating Hormone) and LH (Luteinizing Hormone) and hormones from ovary, estrogen and progesterone control the menstrual cycle.
(3) Due to influence of FSH, the ovarian follicle grows along with the oocyte that is present in it.
(4) This growing follicle produces estrogen.
(5) Under the influence of estrogen, the uterine inner layer called endometrium grows or regenerates. In the meantime the development of follicle is completed.
(6) LH from pituitary stimulates the bursting of ovarian follicle and releases the mature oocyte out of the follicle and the ovarian wall. This process is called ovulation.
(7) The empty ovarian follicle after the ovulation becomes corpus luteum. Corpus luteum produces hormone progesterone.
(8) Under the influence of progesterone, the glands from uterine endometrium start secreting. The oocyte if fertilized is implanted over this endometrium.
(9) If oocyte is not fertilized, the corpus luteum becomes a degenerate body called corpus albicans. The corpus albicans cannot secrete estrogen and progesterone.
(10) Due to lack of these hormones, the endometrial layer of the uterus collapses. The tissue debris, along with unfertilized egg is given out through the vagina as menstrual flow. This results in bleeding for about 5 days.
(11) If woman is not pregnant, then this menstrual cycle keeps on repeating with regularity.

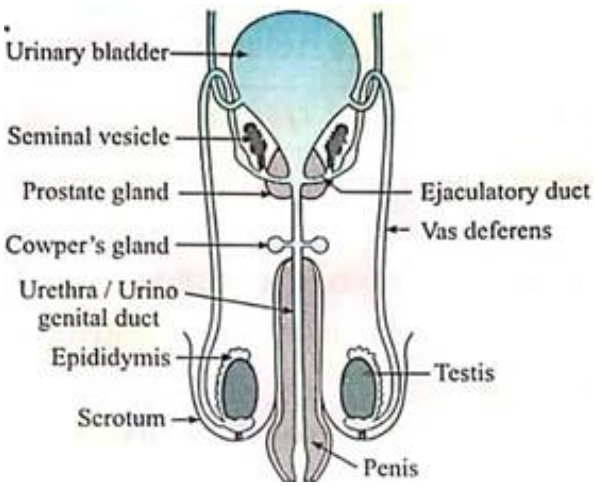
**5. In case of sexual reproduction, newborn show similarities about characters. Explain this statement with suitable examples.**

**Ans.** (1) Sexual reproduction occurs due to two different gametes. One male gamete is from father while the other female gamete is from mother.
(2) Both the gametes are produced by meiosis.
(3) When the gametes unite it is called process of fertilization which produces diploid zygote.
(4) Due to the chromosomes of parents, their DNA pass to the next generation through such fertilization, Therefore, the characters of newborn show similarities with parents.

**6. Sketch the labeled diagram.**

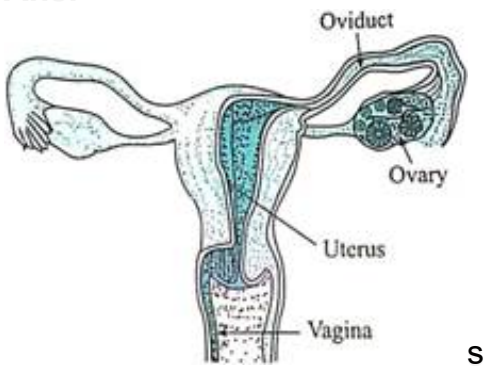
**(1) Human male reproductive system.**

**Ans.**




**(2) Human female reproductive system.**

**Ans.**

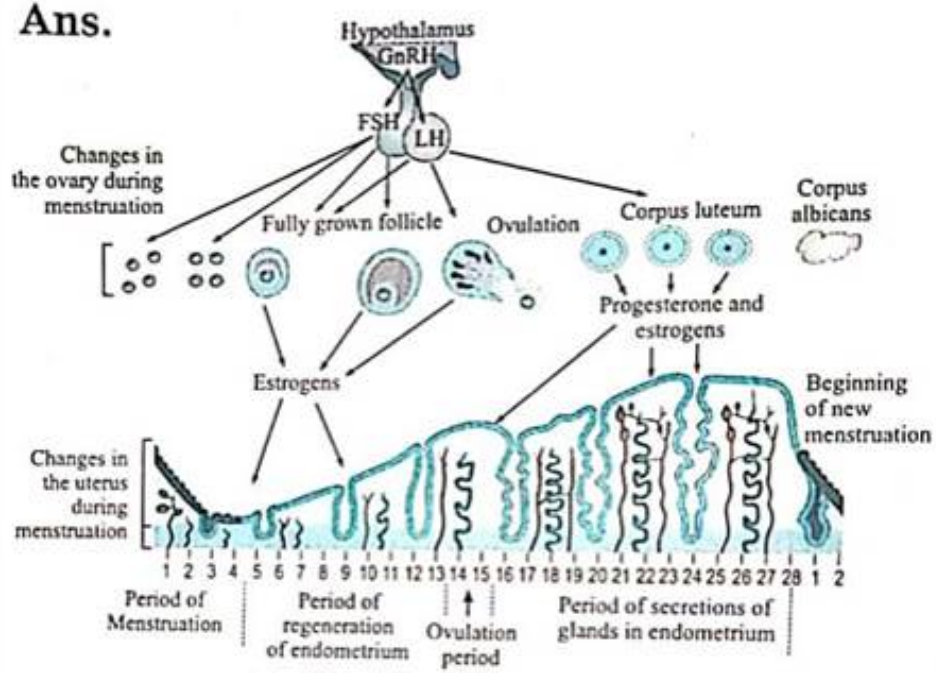


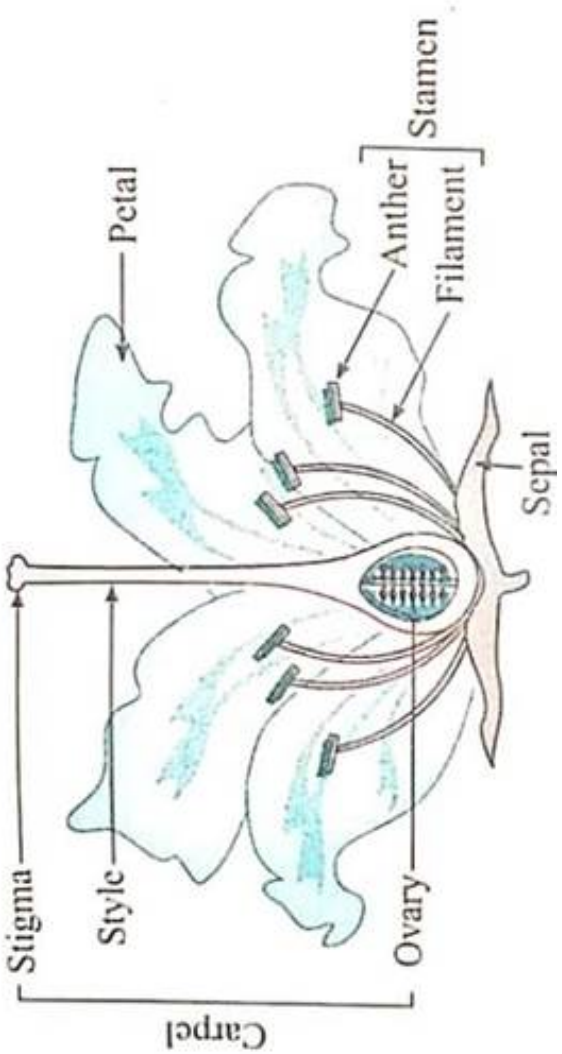

s

**(4) Flower with its sexual reproductive system**

**Ans. (Rotate your phone)**

**Ans.**






**7. Give the names.**
**a. Hormones related with male reproductive system.**
**Ans.** Follicle stimulating hormone and ICSH or Luteinizing hormone secreted by pituitary gland, testosterone secreted by testis.

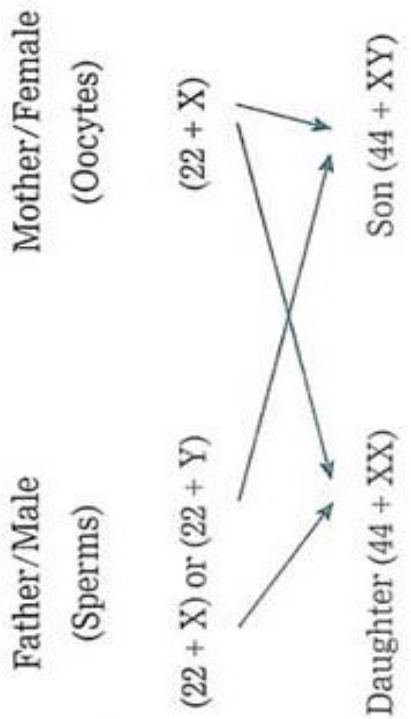
**b. Hormones secreted by ovary of female reproductive system.**
**Ans.** Estrogen and progesterone.

**c. Types of twins.**
Ans. Monozygotic twins, Siamese twins and Dizygotic twins.

**d. Any two sexual diseases.**
**Ans. Gonorrhoea and Syphilis.**

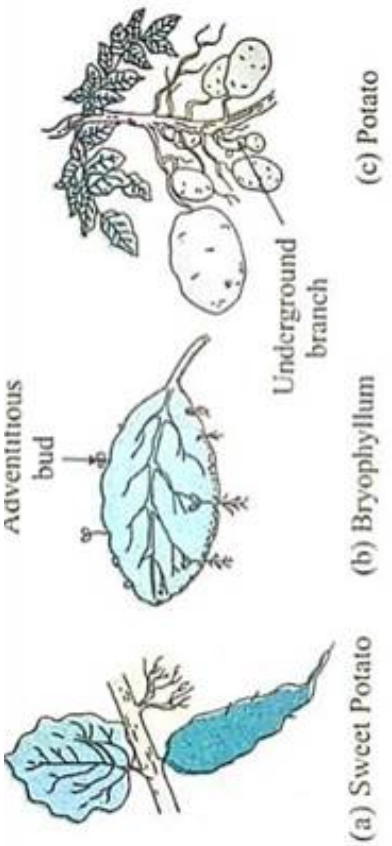
**e. Methods of family planning.**
**Ans.** planning. Ans. Copper

**8. Gender of child is determined by the male partner of couple. Explain with reasons whether this statement is true or false.**
**Ans. (Rotate your phone)**




(1) The statement Gender of child is determined by the male partner of couple is true.
(2) It is clearly seen from the diagram that there are two types of sperms produced by males. One sperm has a X chromosome while the other has a Y chromosome, apart from autosomes. The mother on the other hand has all X bearing oocytes. Thus the sperm that fertilizes the oocyte decides the sex of the child.
(3) If X bearing sperm fertilizes the oocyte, daughter is born and when Y bearing sperm fertilizes the oocyte, son is born.
(4) Thus father or male partner is responsible for the determination of the sex.

**9. Explain asexual reproduction in plant.**
**Ans. (Rotate your phone)**

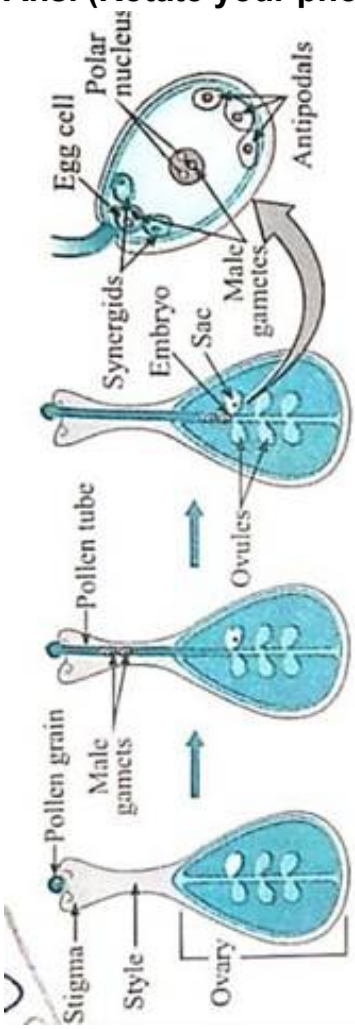



(1) Vegetative propagation is the method of asexual reproduction in plants.
(2) It takes place with the help of vegetative parts like root, stem, leaf and bud.
(3) Carrot, beet root and radish are the modified roots that perform vegetative propagation. (4) Potato, suran (Amorphophallus) and other tubes propagate with the help of 'eyes' which are buds. These eyes are present on the stem tubers.
(5) In case of plants like sugarcane and grasses,buds present on nodes perform vegetative propagation.
(6) Plants like Bryophyllum performs vegetative propagation with the help of buds present on leaf margin.

**10. Modern techniques like surrogate mother, sperm bank and IVF technique will help the human beings. Justify this statement.**
**Ans.** (1) Some couples want a child but they are not able to bear one due to various problems either is in mother or in father. In such cases modern techniques such as IVF, surrogacy and sperm bank are useful in conceiving a child.
(2) In woman if there are problems like irregularity in menstrual cycle, difficulties in oocyte production or implantation in uterus, obstacles in the oviduct, etc. then she can resort to any one technique of the above.
(3) In man if there are no sperms in the semen, slow movement of sperms, or anomalies in the sperms then he becomes sterile.
(4) But now with the help of advanced medical techniques these problems can be overcome and a childless couple can be parents.
(5) These methods are as follows: (i) Surrogacy: In woman if there is problem regarding the implantation of embryo in uterus, the help of another women is taken. This women is called surrogate mother.

Oocyte from real mother is taken out and fertilized with sperms collected from her husband. These gametes are fertilized outside in a test-tube and then the fertilized zygote is implanted in the surrogate mother.
(ii) In Vitro Fertilization (IVF) is done when there are problems like less sperm count or obstacles in oviduct. In IVF, fertilization is done in the test tube. The embryo formed is implanted in uterus of woman for further growth.
(iii) Sperm bank: If man has problems with the sperm production, then the sperms are collected from the sperm bank. Sperm bank is the place where the donor's donate the sperms and such sperms are kept stored. The donor's identity is kept secret and he should also be physically and medically fit person.

**11. Explain sexual reproduction in plants.**
**Ans. (Rotate your phone)**




(1) Plants reproduce sexually with the help of flowers.
(2) Androecium and gynoecium are male and female parts of the flowers respectively.
(3) In the carpel, the ovule undergoes meiosis and forms embryo sac.
(4) A haploid egg cell and two haploid polar nuclei are present in each embryo sac.
(5) The pollen grains from the anther reach the stigma of flower by the process of pollination. They germinate here on the stigma.
(6) As a result of germination, long pollen tube and two male gametes are formed.
(7) The pollen tube travels through the style of flower and the male gametes present in the pollen tube are transferred till the embryo sac in ovary. Upon reaching there, tip of the pollen

tube bursts releasing two male gametes in embryo sac.
(8) One male gamete unites with the egg cell and forms zygote. While other male gamete unites with two polar nuclei forming the endosperm.
(9) Because there are two nuclei participating in this process, therefore it is called double fertilization.
(10) After fertilization ovule develops into seed and ovary forms a fruit. When the seed again gets favourable conditions, it can produce a new plant.