THE VILLAGE
INTERNATIONAL SCHOOL
"We Nurture Dreams"

CHAPTER 8 – How do organisms reproduce?

Long Answer Type Questions – 5 marks

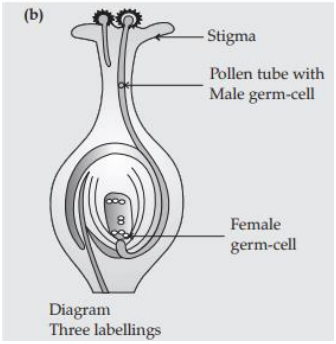
1. Different organisms reproduce by different methods suitable to their body designs. (i) Justify the above statement using examples of three different organisms which reproduce by different methods of asexual reproduction. (ii) Differentiate between sexual and asexual modes of reproduction.
   Ans. (i) Binary Fission in Amoeba—In this method, the nucleus first divides amitotically into two, followed by the division of the cytoplasm. The cell finally splits into two daughter cells. So, from one Amoeba parent, two daughter amoebae are formed. (ii) Budding in Hydra—In Budding, a small part of the body of the parents grows out as a 'bud' which then detaches and becomes a new organism. Hydra reproduces by budding using the regenerative cells. A bud develops as an outgrowth in hydra due to repeated cell division at one specific site. When fully mature, the bud detaches itself from the parent body and develops into new independent individuals. (iii) Regeneration in Planaria—In this method, small cut or broken parts of the organisms body grow or regenerate into separate individuals. Planaria can be cut into any number of pieces and each piece grows into a complete organism.

2. Differentiate between the following : (i) Pollen tube and style. (ii) Fission in Amoeba and Plasmodium (iii) Fragmentation and regeneration (iv) Bud of Hydra and bud of Bryophyllum (v) Vegetative propagation and Spore formation

   Ans. Pollen Tube -Pollen tube is the part of the male gametophyte in plants. It is a long tube like structure that carries the male gamete from the stigma to the ovules. Style - It is a part of the female reproductive organ, carpel. It joins the stigma to the ovary. It is made up of soft tissues which allows the pollen tube to grow downwards towards the ovule. (ii) Binary fission in Amoeba : A single cell divides itself into two daughter cell is known as binary fission, binary fission can also occur in particular axis. e.g., Amoeba. Multiple fission in Plasmodium : It is also a mode of asexual reproduction in which a cell divides itself into many daughter cells simultaneously. It occur in definite orientation. e.g., yeast , malarial parasites. (iii) Regeneration is of two types, in the first type, a part of the body that gets broken off or cut is regenerated. For example, lizards cast off their tails to escape predators and then regenerate them. The other type of regeneration involve the capacity to give rise to an entire organism from a cut part. It is seen in small invertebrates such as Planaria and Hydra. Fragmentation is also a mode of asexual reproduction. It is the unintentional cutting up of the body of an organism which each grows into different organism. It is most commonly seen in some algae. (iv) In Hydra, the cells divide rapidly at a specific site and develop as an outgrowth called a bud. These buds, while attached to the parent plant, develop into small individuals. When this individual becomes large enough, it detaches itself from the parent body to exist as an independent individual. In the Bryophyllum the leaves have small buds (as in potato). These buds later converts into small and very small plants which also have roots present on them. When these buds start growing further then the leaf becomes heavy and falls on the ground. Then the buds which are present on the leaf dumps into ground and forms a plant. (v) Vegetative propagation : It is the ability of plants to reproduce by producing new plants from vegetative parts such as roots, stem, and leaves. Spore formation : Spore formation is the mode of asexual reproduction in some organisms like fungi in which it gives rise to a globular structure known as sporangia, which contains spores. The sporangia burst to release spores and each of these spores germinates to produce a new individual

3. What is pollination ? Give its two types. (b) Draw a longitudinal section of female reproductive part of a flower showing germination of pollen grain. Label on it the following : (i) Stigma; (ii) Pollen tube with a male germ cell; (iii) Female germ cell.

Ans. (a) Pollination : Process of transfer of pollen grains from the anther to the stigma of the flower. Two types : Self-pollination and Cross pollination



4. Give one example each of a unisexual and a bisexual flower. (ii) Mention the changes a flower undergoes after fertilisation. (iii) How does the amount of DNA remain constant though each new generation in a combination of DNA copies of two individuals ?

Ans. (i) Unisexual flowers : Cucumber, pumpkin, water melon, papaya, etc. Bisexual flowers : Hibiscus, rose, lily, etc. (Any one example) (ii) Changes in a flower after fertilisation : The outer layers of the ovule become impervious and hard and function as a seed coat. An ovule with an embryo inside is called a seed. The ovary enlarges and ripens to become a fruit. Other floral parts such as sepals, petals, stamens, styles and stigma may fall off. However, in some cases, they remain persistent in the fruit. (iii) Deoxyribonucleic acid (DNA) copying is an essential part of reproduction, as it passes genetic information from parents to offspring. The reproducing cells produce a copy of their DNA through some chemical reactions and result in two copies of DNA. The copying of DNA always takes place along with the creation of additional cellular structure. This process is then followed by the division of a cell into two cells. In this way, the amount of DNA remains constant through each new generation.

5. What is pollination ? How does it occur in plants ? How does pollination lead to fertilization ? Explain.

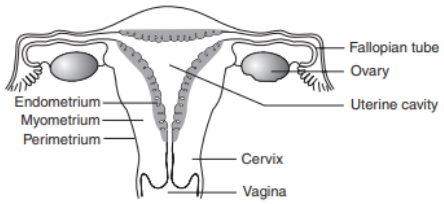
Ans. The transfer of pollens from anther to the stigma of a flower is called pollination. The transfer is accomplished by an external agency such as wind (anemophily), water (hydrophily), insects (entomophily), birds (ornithophily), bats (chiropterophily), etc. Both wind and water are abiotic agencies while insects, birds, bats etc. are biotic agencies of pollination. After falling on stigma, the pollen grain absorbs water and nutrients. It produces a tube called pollen tube. Pollen tube grows through style and reaches the ovary. Its tip contains a tube nucleus and two male gametes or sperm cells. The advancing pollen tube enters an ovule, generally through micropyle and reaches the interior of the embryo sac. Here the tube bursts to release its two male gametes. One male gamete fuses with egg to form zygote and the second male gamete fuses with binucleate central cells which forms endosperm.

6. Write the functions of the following parts in human female reproductive system : (i) Ovary, (ii) Oviduct, (iii) Uterus (b) Describe the structure and function of placenta.

Ans.(a) (i) Ovary— (i) Production of female hormone (ii) Production of female gamete (ii) Oviduct (i) Transfer of female gamete from the ovary (ii) Site of fertilization (iii) Uterus—(i) Implantation of the zygote. (ii) Nourishment of the developing embryo/placenta formation. (b) Structure of Placenta : It is a disc like structure embedded in the uterine wall connected to the embryo. It has villi on the embryo‘s side of the tissue and on the mother side, it has blood spaces, which surround the villi. Function of Placenta : It provides a large surface area for nutrients/glucose and oxygen to pass from the mother‘s side to the embryo and waste substances from the embryo‘s side to mother’s blood.

7. Draw a sectional view of human female reproductive system and label the part where (i) eggs develop. (ii) fertilization take place. (iii) fertilized egg gets implanted. (b) Describe, in brief, the changes the uterus undergoes. (i) to receive the zygote. (ii) if zygote is not formed.

Ans. (a) The human female reproductive system consists of a pair of ovaries, a pair of oviducts, the uterus and the vagina.



The development of egg occurs in the ovary. (ii) Fertilisation takes place in the fallopian tubes. (iii) The fertilised egg gets implanted in the uterus. (b) (i) The uterus prepares itself every month to receive a fertilized egg/zygote. The inner uterus lining (endometrium) becomes thick and is supplied with blood to nourish the embryo. (ii) If the egg is not fertilised, then the uterus lining is not required. Hence, it breaks down and gets released in the form of blood and mucous through the vagina. This process lasts for 2–8 days. This cycle occurs every month and is known as menstruation.

8. Name two sexually transmitted disease. (b) Why prenatal sex determination is prohibited by law. (c) What are the different methods of contraception ?

Ans. (a) AIDS, Syphilis. (b) Surgery can be used to prevent frequent or unwanted pregnancies. However,this method can be used by people for gender-selective abortion as happens in illegal female foeticides. As a result of prenatal gender determination, the child-gender ratio is declining at an alarming rate in many of our societies. Therefore,prenatal gender-determination has been prohibited by law. (c) (i) Creating a mechanical barrier so that the sperms do not reach the egg. This is done with a condom which is worn around the penis or a similar device that is placed in the vagina. (ii) Changing the hormonal balance of the body so that fertilization cannot occur. This is done with the help of oral contraceptive pills. (iii) Contraceptive devices like loop or copper-T are placed in the uterus to prevent pregnancy. (iv) Surgical methods like vasectomy in males and tubectomy in females.