Chap 7: How do Organisms Reproduce?

1. Why is reproduction essential for living organisms?

Reproduction is the process by which organisms produce new individuals of the same species.

• Individuals die, so new ones are needed for the species to continue. Without reproduction, a species would become extinct.

• It keeps the population of a species stable.

• Reproduction involves copying of DNA. Small errors in copying bring variation, which helps a species survive changes in its surroundings.

Reproduction is not needed for the survival of an individual, but for the survival of the species.

2. What are the differences between asexual and sexual reproduction?

Asexual reproduction	Sexual reproduction
Only one parent is involved.	Two parents are involved.
No gametes are formed.	Male and female gametes fuse.
Offspring are identical to the parent.	Offspring are different from the parents.
Very little variation.	More variation.
eg: Amoeba, Hydra	eg: Humans, flowering plants

3. What is binary fission? Give examples.

In binary fission, a single-celled organism splits into two equal halves. Each half becomes a new organism.

Amoeba can split in any plane.

Leishmania splits in a definite plane, with respect to its whip-like flagellum at one end.

Bacteria and Paramecium also reproduce by binary fission.

4. What is multiple fission? Give an example.

In multiple fission, a single-celled organism divides into many daughter cells at the same time.

The nucleus divides many times, and each nucleus gets a small part of the cytoplasm.

eg: Plasmodium, the malaria parasite, reproduces by multiple fission.

5. How does Hydra reproduce by budding?

In budding, a small outgrowth called a bud grows on the body of the parent.

In Hydra, a bud forms at a specific site on the body due to repeated cell division. The bud grows a mouth and tentacles. When fully grown, it separates from the parent and lives as a new Hydra.

Yeast also reproduces by budding.

6. What is regeneration? Give an example.

Regeneration is the ability of an organism to grow a complete new organism from a cut piece of its body.

eg: If Planaria or Hydra is cut into many pieces, each piece grows into a complete organism.

Specialised cells in the body divide to form many cells. These cells change into different types of cells and tissues to rebuild the missing parts.

7. How does Rhizopus reproduce by spore formation?

Rhizopus (bread mould) grows thread-like structures. Some of them have small round structures called sporangia at the top.

Sporangia contain many spores. When a sporangium bursts, the spores are spread by air.

Spores have a thick wall that protects them in bad conditions. When they land on a moist surface, they grow into new Rhizopus plants.

8. What is vegetative propagation? What are its advantages?

In vegetative propagation, new plants grow from the root, stem or leaf of the parent plant, without seeds.

eg: Buds on the leaf margins of Bryophyllum grow into new plants. Sugarcane, rose and grapes are grown by layering or grafting.

Advantages:

• Plants bear flowers and fruits earlier than plants grown from seeds.

• Plants that have lost the ability to produce seeds, like banana, orange, rose and jasmine, can be grown.
• All new plants are genetically similar to the parent, so good qualities are kept.

9. What is tissue culture? Why is it useful?

In tissue culture, a few cells are taken from the growing tip of a plant and kept in a nutrient medium. The cells divide to form a mass of cells called callus. The callus is then moved to a medium with hormones, where it grows into small plantlets. These are planted in soil.

It is used to grow many disease-free plants quickly, at any time of the year. It is commonly used for ornamental plants.

10. Name the male and female reproductive parts of a flower.

Male part - Stamen. It has the anther, which produces pollen grains, and the filament, which holds the anther.

Female part - Pistil (carpel). It has the stigma (sticky top that receives pollen), the style, and the ovary. The ovary contains ovules, and each ovule has an egg cell.

After fertilisation, the ovule becomes the seed and the ovary becomes the fruit.

11. What is pollination? Distinguish between self-pollination and cross-pollination.

Pollination is the transfer of pollen grains from the anther to the stigma.

Self-pollination	Cross-pollination
Pollen reaches the stigma of the same flower or another flower of the same plant.	Pollen reaches the stigma of a flower on another plant.
No agent is needed.	Needs agents like wind, water, insects or birds.
No new variation.	Brings variation.

12. How does fertilisation take place in a flowering plant?

After pollination, the pollen grain on the stigma grows a pollen tube. The tube grows down through the style and reaches the ovule in the ovary.

The male germ cell travels through the tube and fuses with the egg cell in the ovule. This fusion is fertilisation, and it forms a zygote.

The zygote grows into an embryo inside the seed. The ovary grows into a fruit, while the petals, sepals, stamens, style and stigma dry and fall off.

13. What is the role of the placenta?

The placenta is a disc-shaped tissue in the wall of the uterus. It connects the mother and the developing embryo.

• Glucose and oxygen pass from the mother's blood to the embryo.
• Waste made by the embryo passes into the mother's blood to be removed.

The placenta has villi on the embryo's side, which give a large surface area for this exchange.

14. What happens when the egg is not fertilised?

Every month, the ovary releases one egg, and the uterus prepares a thick, spongy lining with a good blood supply to nourish an embryo.

If the egg is not fertilised, this lining is not needed. It slowly breaks down and comes out through the vagina as blood and mucus. This is called menstruation.

It happens roughly once a month and lasts for about 2 to 8 days.

15. What are the different methods of contraception?

Contraception means methods that prevent pregnancy.

• Barrier methods - condoms stop sperm from reaching the egg. They also protect against sexually transmitted diseases like HIV-AIDS.
• Hormonal methods - oral pills change the hormone balance so that eggs are not released.
• Devices - a copper-T placed in the uterus prevents pregnancy.
• Surgical methods - the vas deferens in males or the fallopian tubes in females are blocked.