Class 10 Solutions Science Chapter 7 How Do Organisms Reproduce

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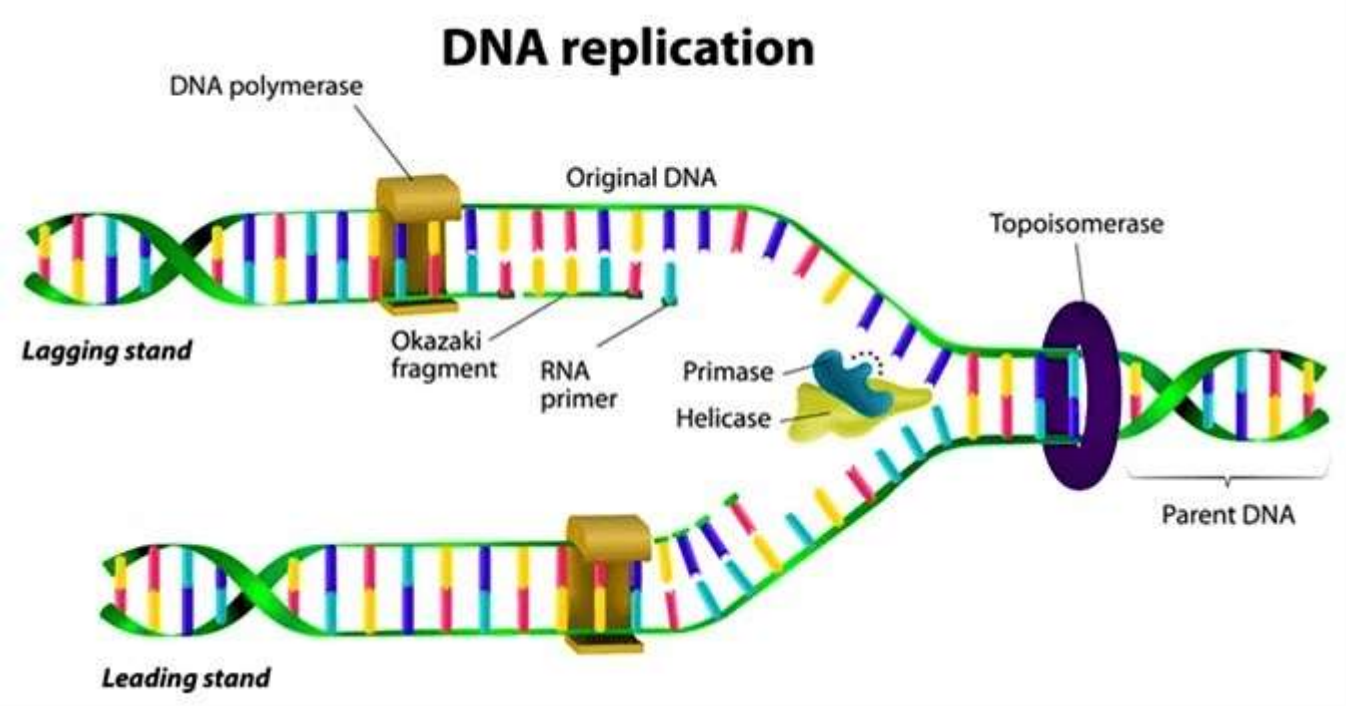
Q1: What is the importance of DNA copying in reproduction?
Ans:

- DNA **(Deoxyribonucleic acid)** is the genetic material found in the chromosomes, which are present in the nucleus of a cell.



- The DNA is the information site for making proteins, and each specific type of protein leads to a specific type of body design.
- Thus, it is the DNA molecule that determines the body design of an individual.
- Therefore, it can be concluded that it is the DNA which gets transferred from parents to offspring and makes them look similar.
- DNA determines the body's structure.

Q2: Why is variation beneficial to the species but not necessarily for the individual?
Ans:

- Variations are more beneficial to the species than the individual because sometimes, for a species, the environmental conditions change so drastically that their survival becomes difficult.
  Example: If the temperature of water increases suddenly, then most of the bacteria living in that water will die. Only a few variants that are resistant to heat would be able to survive.
- However, if these variants had not been present, then the entire species of bacteria would have been destroyed.

- Thus, these variants help in the survival of the species. However, not all variations are necessarily beneficial for individual organisms.

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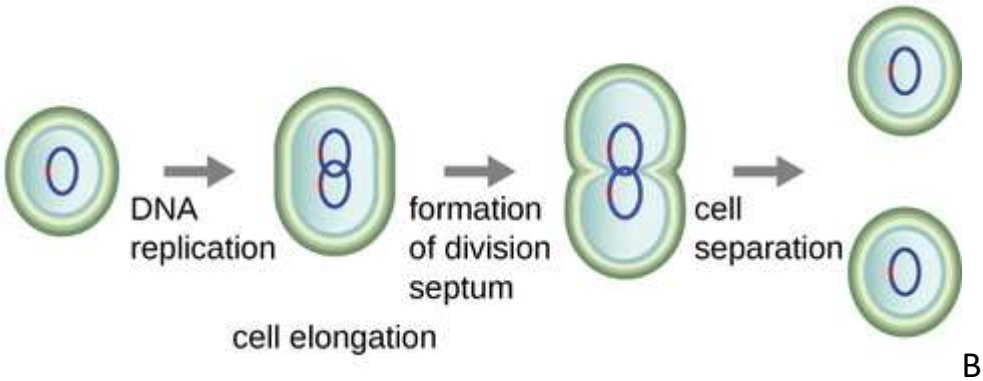
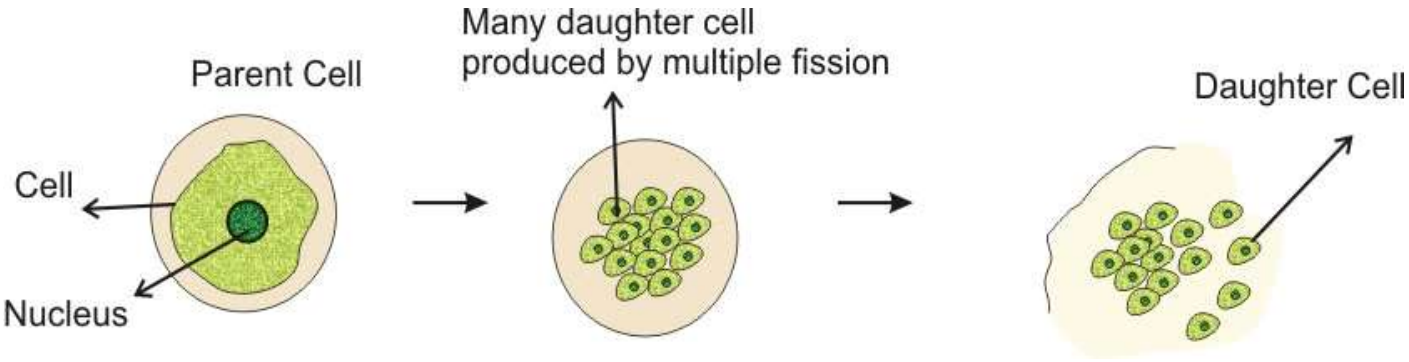
Q1: How does binary fission differ from multiple fission?
Ans:

- In binary fission, **a single cell divides into two equal halves**. Amoeba and Bacteria divide by binary fission.



Binary Fission in Bacteria

- In multiple fission, **a single cell divides into many daughter cells** simultaneously. Amoeba and Plasmodium divide by multiple fission.



Multiple Fission in Plasmodium

Q2: How will an organism be benefited if it reproduces through spores?
Ans: There are many advantages if an organism reproduces through spores.
Advantages of spore formation:

- Large numbers of spores are produced in one sporangium.
- Spores are distributed easily by air to far-off places to avoid competition in one place.

- Spores are covered by thick walls to prevent dehydration under unfavourable conditions.

Q3: Can you think of reasons why more complex organisms cannot give rise to new individuals through regeneration?
Ans:

- Simple organisms such **as Hydra and Planaria** are capable of producing new individuals through the process of regeneration.
- The process of regeneration involves the formation of new organisms from their body parts.
- Simple organisms can utilize this method of reproduction as their entire body is made of similar kind of cells in which any part of their body can be formed by growth and development.
- However, complex organisms have **an organ-system level of organization**.
- All the organ systems of the body work together as an **interconnected unit**.
- They can regenerate their lost body parts such as skin, muscles, blood, etc. However, they cannot give rise to new individuals through regeneration.

Q4: Why is vegetative propagation practised for growing some types of plants?
Ans:

- Plants raised by vegetative propagation can bear flowers and fruits earlier than those produced from seeds.
- It also helps in the propagation of plants such as bananas, oranges, roses and jasmine that have lost the capacity to produce seeds.
- All plants produced by this method are genetically similar to the parent plant in that they have all characteristics.
- Thus, desirable features of the parent plant can be retained and expressed without any change in future generations.

Q5: Why is DNA copying an essential part of the process of reproduction?
Ans:

- DNA (Deoxyribonucleic acid) copying is an essential part of reproduction as it **passes genetic information from parents to offspring**.
- It determines the body design of an individual.
- The reproducing cells produce a copy of their DNA through chemical reactions that result in two copies of DNA.
- The copying of DNA always takes place along with the creation of the additional cellular structure.
- This process is then followed by **the division of a cell to form two cells**.

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Q1: How is the process of pollination different from fertilization?
Ans:

Pollination	**Fertilization**
It only requires the male gamete (pollen grains).	It requires both the male and the female gametes.
It is the transfer of pollen grains from the anther to stigma of one flower or another flower of different plant but of the same species.	It is the fusion of the male gamete and the female gamete which results in the formation of a zygote.
It may or may not require external agents like insects, birds, water, etc.	It does not require any external agents.

Q2: What is the role of the seminal vesicles and the prostate gland?
Ans: The secretions from seminal vesicles and prostate glands lubricate the sperms and provide a fluid medium for easy transport of sperms. Their secretion also provides nutrients in the form of **fructose, calcium, and some enzymes**.

Q3: What are the changes seen in girls at the time of puberty?
Ans: Secondary sexual characteristics in girls:

- Increase in breast size and darkening of the skin of the nipples present at the tips of the breasts.
- The appearance of hair in the genital area.
- The appearance of hair in other areas of skin like underarms, face, hands, and legs.
- Increase in the size of the uterus and ovary.
- Beginning of menstrual cycle.
- More secretion of oil from the skin, which results in the appearance of pimples.

Q4: How does the embryo get nourishment inside the mother's body?
Ans:

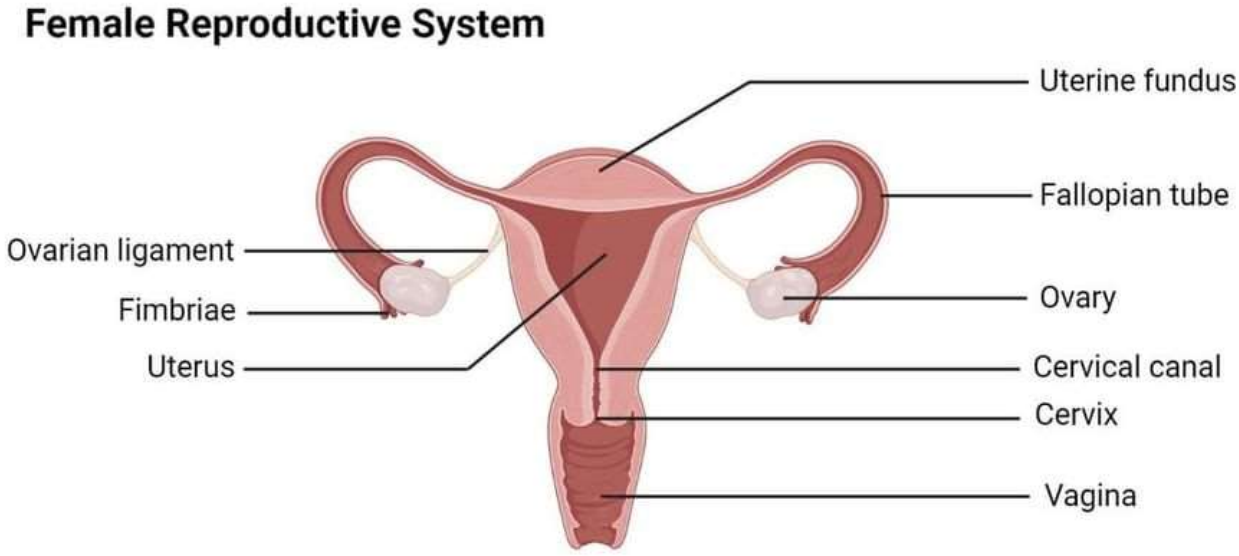
- The embryo develops inside the mother's body for about nine months. Inside the uterus, the outer tissue surrounding the embryo develops finger-like projections called **villi**.
- These villi are surrounded by uterine tissue and maternal blood.
- They provide a large surface area for the exchange of oxygen and nutrients.
- Also, there is a special tissue called the **placenta**, which is embedded in the uterine wall.
- The embryo receives the oxygen and nutrients from the mother's blood via the placenta.
- The waste materials produced by the embryo are also removed through the placenta.

Q5: If a woman is using a copper–T, will it help in protecting her from sexually transmitted diseases?
Ans: No. Using a copper-T will not provide protection from sexually transmitted diseases, as it does not prevent the entry of semen. It only prevents the implantation of the embryo in the uterus.

Exercise: Page No. 141

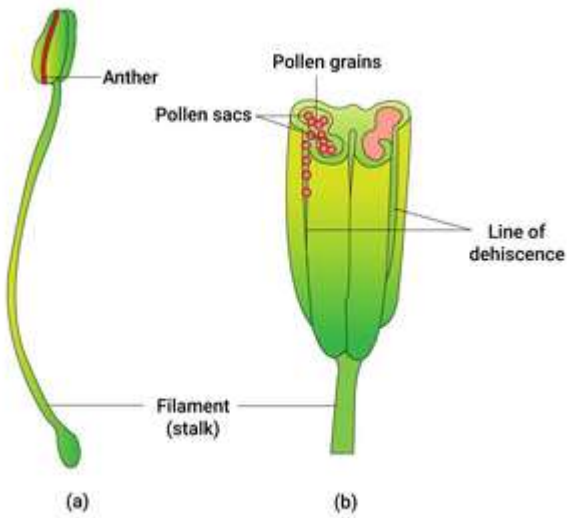
Q1: Asexual reproduction takes place through budding in
(a) amoeba
(b) yeast
(c) plasmodium
(d) leishmania
Ans:(b) Asexual reproduction takes place through budding in yeast.
Yeast is an example of asexual reproduction taking place through budding. A small protuberance is produced on the parent cell that grows in full size, forming a bud. In the parent cell, the daughter nucleus splits and migrates to the daughter cell. By forming a constriction, the bud detaches from the mother's body at the base. This process of budding continues to form a chain of bud cells. The mother cell is smaller than the daughter cell.

Q2: Which of the following is not a part of the female reproductive system in human beings?
(a) Ovary
(b) Uterus
(c) Vas deferens
(d) Fallopian tube
Ans:(c) Vas deferens is not a part of the female reproductive system in human beings.



Vas deferens is a part of the male reproductive system. It is a long, muscular tube travelling from the epididymis into the pelvic cavity. It is behind the bladder. Its function is to transport the mature sperm to the urethra. It also carries urine outside of the body.

Q3: The anther contains
(a) sepals
(b) ovules
(c) pistil
(d) pollen grains
Ans:(d) The anther contains pollen grains.



(a) Stamen

(b) 3-D Cut-section of an Anther

The stamen are male reproductive organs. They contain anther, which is a site of pollen development. Inside the anther, the male sporogenous cell differentiates and undergoes meiosis to produce microspores that develop into pollen grains.

Q4: What are the advantages of sexual reproduction over asexual reproduction?
Ans: Advantages of sexual reproduction:

- In sexual reproduction, more variations are produced. Thus, it ensures the survival of species in a population.
- The newly formed individual has the characteristics of both parents.
- Variations are more viable in the sexual mode than in the asexual one. This is because, in asexual reproduction, DNA has to function inside the **inherited cellular apparatus**.

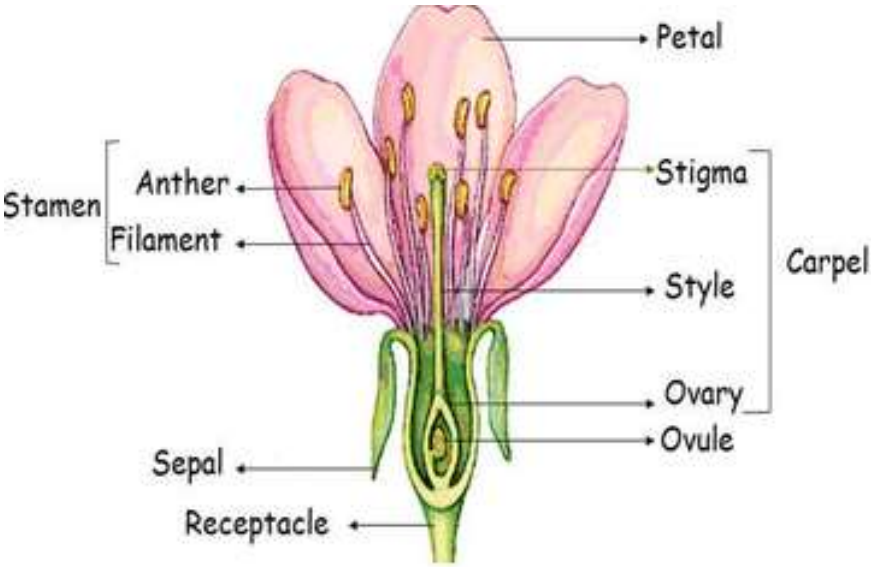
Q5: What are the functions performed by the testes in human beings?
Ans: The testes are the male reproductive organs that are located outside the abdominal cavity within a pouch called the **scrotum**.
Functions of testes:

- Produce **sperms**.
- Produce a hormone called **testosterone**, which brings about secondary sexual characteristics in boys.

Q6: Why does menstruation occur?
Ans:

- Menstruation is a process in which blood and mucous flows out every month through the vagina.
- This process occurs every month because one egg is released from the ovary every month and at the same time, **the uterus (womb) prepares itself to receive the fertilized egg**.
- Thus, the inner lining of the uterus gets thickened and is supplied with blood to nourish the embryo.
- If the egg does not get fertilized, then **the lining of the uterus breaks down slowly and gets released in the form of blood and mucus from the vagina.**

Q7: Draw a labelled diagram of the longitudinal section of a flower.
Ans:



Longitudinal Section of a Flower

Q8: What are the different methods of contraception?

Ans: The contraceptive methods can be broadly divided into the following types:

1. Natural Method

- It involves avoiding the chance of meeting the sperm and ovum.
- In this method, the sexual act is avoided from the 10th to the 17th of the menstrual cycle because, during this period, ovulation is expected, and therefore, the chances of fertilization are very high.

2. Barrier Method

- In this method, the **fertilization of the ovum and sperm** is prevented with the help of barriers.
- Barriers are available for both males and females.
- Condoms are barriers made of thin rubber that are used to cover the penis in males and the vagina in females.

3. Oral Contraceptives

- In this method, tablets or drugs are taken orally.
- These contain small doses of hormones that prevent the release of eggs, and thus, fertilization cannot occur.

4. Implants and Surgical Methods

- **Contraceptive devices** such as the loop or Copper-T are placed in the uterus to prevent pregnancy.
- Some surgical methods can also be used to block the gamete transfer. It includes the blocking of the vas deferens to prevent the transfer of sperm, known as **vasectomy**.
- Similarly, **the fallopian tubes** of the females can be blocked so that the egg will not reach the uterus, known as **tubectomy**.

Q9: How are the modes of reproduction different in unicellular and multicellular organisms?

Ans:

- In unicellular organisms, reproduction occurs by the **division of the entire cell**.
- The modes of reproduction in unicellular organisms can be fission, budding, etc.
- Meanwhile, specialised reproductive organs are present in multicellular organisms. Therefore, they can reproduce by complex reproductive methods such as vegetative propagation, spore formation, etc.
- In more complex multicellular organisms such as human beings and plants, the mode of reproduction is sexual reproduction.

Q10: How does reproduction help in providing stability to populations of species?

Ans:

- Living organisms reproduce for the continuation of a particular species.
- It helps in providing stability to the population of species by producing a new individual that resembles the parents.
- This is the reason why cats give birth to only cats or dogs give birth to only dogs.
- Therefore, reproduction provides stability to populations of dogs or cats or any other species.

Q11: What could be the reasons for adopting contraceptive methods?
Ans: Contraceptive methods are mainly adopted because of the following reasons:

- To prevent **unwanted pregnancies**.
- To control **population rise or birth rate**.
- To prevent the transfer of **sexually transmitted diseases**.