

Important Questions for Class 12 Chapter 1: Reproduction in Organism

Reproduction is the process in which new individuals of the same species are produced by the parents which carry an equal number of chromosomes from both the parents. It is a fundamental feature due to which organisms exist. The organisms reproduce in two ways: Sexually and Asexually. Reproduction is an important phenomenon for all known life on earth.

Very Short Answer Type Questions

Q.1. What are the two inherent characteristics of amoeba and yeast that favour asexual reproduction in them?

A.1. The two inherent properties of amoeba that help them to reproduce asexually are:

- They have relatively simple structures and can divide very quickly.
- They are uniparental.

Q.2. “The offsprings produced by asexual reproduction are referred to as clones”. Why?

A.2. During asexual reproduction, there is no fusion of gametes and a single parent divides and redivides to produce the offsprings. Hence, the offsprings are morphologically and genetically similar to the parents and therefore referred to as clones.

Q.3. Why is potato tuber considered as a stem though it is an underground part? Give two reasons in support of your answer?

A.3. The potato is referred to as a stem because:

- It has nodes and internodes.
- It can form plantlets from the buds present over the nodes.

Q.4. Among the annual and the perennial plants, which one has a shorter juvenile period. Explain.

A.4. The entire life cycle of an annual plant has to be completed in one year which is shorter than that of the perennial plants. Hence, it has a shorter juvenile period.

Q.5. Rearrange the following events in the sequence in which they occur in the sexual reproduction of flowering plants: embryogenesis, fertilization, gametogenesis, pollination.

A.5. Pollination, Gametogenesis, Fertilization, Embryogenesis.

Q.6. How is it that the chances of fruit set in a self-pollinated bisexual flower of a plant are far greater than a dioecious plant?

A.6. In a bisexual flower, the anther and stigma lie close to each other. Thus, the transfer of pollen to stigma is easier than dioecious plants. However, in a dioecious plant, a pollinator is necessary to carry out pollination. Therefore, the chances of fruit set in a self-pollinated bisexual flower are far greater than a dioecious plant.

Q.7. Is sexual reproduction hindered by the presence of a large number of chromosomes in an organism?

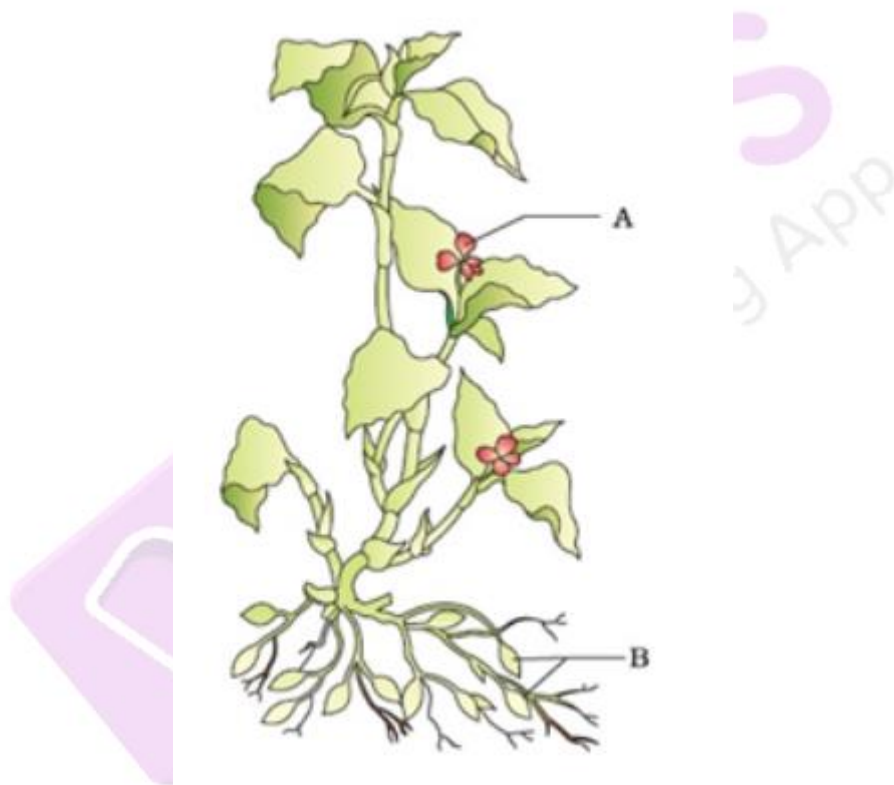
A.7. No, Sexual reproduction is not hindered by a large number of chromosomes in an organism. A fern *Ophioglossum* has 1260 chromosome and still reproduces sexually. The chromosomes are present within the nucleus of a cell. The chromosomes divide and segregate in this compartment irrespective of its number. It generates haploid gametes during sexual reproduction.

Q.8. Explain giving two examples if there is a relationship between the size and the lifespan of an organism.

A.8. There is no relationship between the size and lifespan of an organism. For eg.,

- The size of a crow and a parrot is the same but a crow can live for 15 years while a parrot, 140 years.
- The mango tree and the banyan tree have the same size but the lifespan of a mango tree is shorter than that of the banyan tree.

Q.9. There are two different types of flowers marked A and B in the image given below. Identify the flower types and the kind of pollination that will occur in each of them.



A.9. A- Chasmogamous Flower (these remain open exposing the anther and stigma) B- Cleistogamous Flower (these remain closed) The type of pollination that will occur in this plant is Cleistogamy, a type of autogamy in which plants possess both chasmogamous and cleistogamous flowers. In this, the chasmogamous flowers may undergo self-pollination or cross-pollination, and the cleistogamous flowers may undergo only self-pollination.

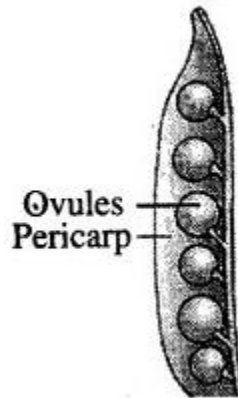
Q.10. Why can't multicellular organisms reproduce by cell division?

A.10. cell division takes place in the body of a multicellular organism but it does not aid in reproduction. Every day millions of cells die and are replaced by others. Multicellular organisms have well-developed reproductive organs that carry out the reproduction process.

Q.11. Mark the ovule and the pericarp in the figure given below.



A.11.



Q.12. Why is it so that the gametes produced in the organisms in large numbers exhibit external fertilization?

A.12. Producing a large number of gametes increases the chances of at least one sperm fertilizing the egg. Also, the gametes released can be affected by predators and desiccation. That is why the gametes produced in large numbers exhibit external fertilization.

Q.13. Identify the monoecious and dioecious organisms.

- Earthworm
- Chara
- Marchantia
- Cockroach

A.13. Earthworm- Monoecious Chara- Monoecious Marchantia- Dioecious Cockroach- Dioecious

Q.14. Match the following:

Column A

Column B

Bryophyllum	Offset
Agave	Eyes
Potato	Leaf Buds
Water hyacinth	Bulbils

A.14. Bryophyllum-Leaf Buds; Agave- Bulbils; Potato- Eyes; Water hyacinth- Offset

Q.15. Post-fertilization, what do the following parts of the flower grow into?

- Ovary
- Ovules

A.15. Ovary grows into a fruit. Ovule grows into a seed

Short Answer Type Questions

Q.1. Name the stage in the life-cycle during meiosis in the haploid organisms that undergo sexual reproduction. Give reasons as well.

A.1. Meiosis takes place in the diploid stage. This is because the zygote is the only diploid cell in the life cycle of haploid organisms.

Q.2. In higher plants and higher animals, the number of taxa exhibiting asexual reproduction is drastically reduced as compared to the lower groups of plants and animals. Explain.

A.2. The higher plants and animals have a complex structure as compared to the lower plants and animals. They have well developed sexual reproductive organs. They are structured to reproduce sexually because of the following reasons:

- To ensure genetic recombination which results in variation and gives rise to evolution.
- Healthy progeny are produced.
- Genetically different offsprings are produced.

Q.3. Name the haploid and diploid individuals in the family of honey bees and analyze the reasons behind their formation.

A.3. The sterile worker females are diploid. The fertile female queen bee is diploid. The male drones are haploid. The haploid and diploid individuals are formed both by unfertilized and fertilized eggs, respectively. The fertilized eggs from the female queen bee and the worker bee. The male drones are formed as a result of parthenogenesis, i.e., by unfertilized eggs.

Q.4. Which type of reproduction is a reduction division associated with? Give reasons in support of your answer.

A.4. Reduction division is referred to as meiosis and is associated with sexual reproduction. Reasons:

- The gametes that fuse should be haploid.
- The germ cells are diploid. Meiosis can only reduce the number to half.

Q.5. Is vegetative propagation considered a type of asexual reproduction? Give reasons.

A.5. Yes, vegetative propagation is a type of asexual reproduction. This is because:

- The new individuals are produced by a single parent.
- There is no fusion of gametes.
- They are the exact clones of their parents without any genetic or morphological variations.

Q.6. Why is fertilization not a compulsory event for the production of fruits in certain plants?

A.6. There are a few fruits such as grapes, pomegranate, etc. developed from the unfertilized ovaries. These are known as parthenocarpic fruits. The flowers of such plants are sprayed with a growth hormone that facilitates fruit production even without fertilization. But the ovules do not change into seeds.

Q.7. What will be the consequences if cell division is not followed by cell differentiation in a developing embryo?

A.7. Cell division increases the number of cells whereas cell differentiation helps the cell mass to form specialized tissues and organs. If cell division is not followed by cell differentiation, there will be no embryo development and it will remain only as a mass of the cell.

Q.8. What are the changes that take place in an angiosperm after pollination and fertilization have occurred?

A.8. Following are the changes that occur in an angiosperm after pollination and fertilization:

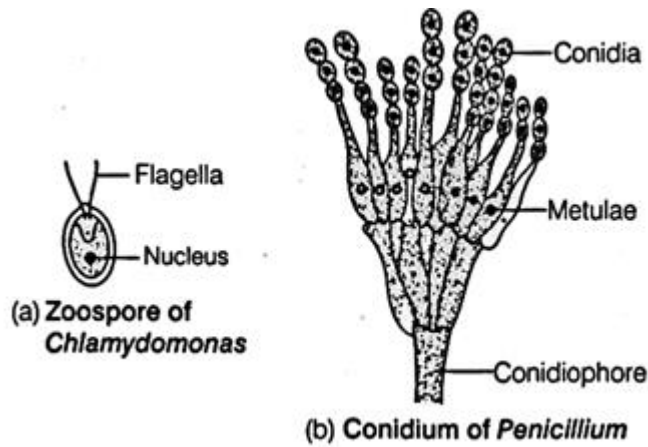
- The sepals, petals and stamens fall off.
- The zygote is converted into an embryo.
- The embryo is present in the ovule. Ovule forms the seed.
- Ovary wall develops into pericarp.
- Ovary forms the fruit.

Q.9. Why are the seeds scattered in the juicy pulp of tomato and arranged in a row in a pea pod?

A.9. Pea plant is leguminous developed from a single carpel. When the seeds mature, the fruit splits into the dorsal and ventral sides and discharges the seeds. The plants which are developed from a single carpel have their ovules attached to the ventral suture. Therefore the fruit is developed with marginal placentation and the seeds are arranged in a row. On the contrary, the tomato is a fleshy fruit developed from the superior or inferior ovary. The central chamber is divided into compartments because the margins of the carpels grow inward to the centre of the ovary. The ovules are attached by the placenta and are arranged radially on the axis. That is why the seeds are scattered.

Q.10. Mention two differences and one similarity between zoospore and conidium. Draw diagrams of each.

A.10.



Differences:

Zoospore	Conidium
Flagellated	Non-flagellated
Endogenous, formed inside a sporangium.	Exogenous, formed at the tip of the conidiophores.

Similarity- Both the structures help in [asexual reproduction](#) in the organisms.

Q.11.What is Embryogenesis?

A.11.Embryogenesis is the biological process by which the embryo is formed and developed into a fetus. Embryogenesis begins with the fertilization of the ovum by sperm.

Q.12.What is Fragmentation?

A.12.Fragmentation is an asexual mode of reproduction. In this, the parent organism splits into several parts and each part grows into a new individual. For eg., Planaria are a group of free-living flatworms reproduce their young ones through Fragmentation

Q.13.What is vegetative propagation?

A.13.Vegetative propagation is an asexual mode of reproduction occurring in plants. This includes both natural and Artificial method of vegetative propagation

Q.14.What is Sexual Reproduction?

A.14.Sexual reproduction is a natural way of reproducing young ones which are identical to their parents. In this type of reproduction, there is an involvement of both the parents. Sexual reproduction is observed only in multicellular organisms like animals, plants, mammals, humans, birds, etc.

Q.15.What is Gametogenesis?

A.15.Gametogenesis is the biological process by which diploid or haploid cells undergo cell division and differentiation to form produce mature haploid gametes In humans, during the process of gametogenesis the two different types of gametes are present.

1. Male gametes – are called sperm.

2. Female gametes- are called the ovum.

Q.16.What is a bisexual flower?

A.16.A flower is a reproductive part of a plant. Based on the reproductive organs present in a flower, it is classified into two – Bisexual and Unisexual flower.

The flower which includes both male (androecium) and female (gynoecium) reproductive organs is called the bisexual flower. A bisexual flower is also referred to as a perfect flower. Lily, rose, and Hibiscus are a few examples of the bisexual flower.

Q.17.What is Asexual Reproduction?

A.17.Asexual reproduction is another mode of reproducing their offsprings. In this type of reproduction, there is an involvement of the only one parent. Asexual reproduction is observed in both multicellular and unicellular organisms.

Q.18.What are the different types of asexual reproduction

A.18.The different types of asexual reproduction are as follows

1. Binary Fission
2. Budding
3. Fragmentation
4. Vegetative Propagation
5. Sporogenesis

Q.19.What is the complete process of sexual reproduction?

A.19.Sexual reproduction includes the following set of events:

1. Pre-fertilization.
2. Fertilization.
3. Post-fertilization.

Q.20.Define Pollination?

A.20.Pollination is a natural process of transferring pollen grains from an anther – the male part of a flower to the stigma – the female part of a flower. There are 2 types of pollination –

1. Self Pollination
2. Cross-Pollination

Long Answer Type Questions

Q.1. State the differences between sexual and asexual reproduction. Explain different types of asexual reproduction in unicellular organisms.

A.1.

Asexual Reproduction	Sexual Reproduction
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When the offspring are born without the contribution of another organism of the same species it is known as asexual reproduction.	When the offspring are born with the help of another organism of the same species but opposite sex, it is known as sexual reproduction.
Organisms reproduce by binary fission, fragmentation, budding, spore formation.	Organisms reproduce by syngamy and conjugation.
Uniparental	Bi-parental
Divide by mitosis.	Divide by mitosis and meiosis
Somatic cells are involved.	Germ cells are involved.
It occurs in unicellular organisms and lower invertebrates with simple structures.	It occurs in higher plants and animals.
No fusion of gametes takes place.	The fusion of gametes takes place.
The cells multiply rapidly in very less time.	This reproduction takes a longer time.
No fertilization takes place.	Fertilization takes place in the process.

Different types of asexual reproduction in organisms:

Binary fission

- It is common in prokaryotes.
- A living cell divides into two daughter cells each containing a nucleus of its own.
- The daughter cells are the exact copies of each other and the parent cell.
- It is seen in amoeba.

Budding

- A new organism grows from an outgrowth or a bud emerging from the body of the organism by the process of cell division.
- The outgrowth derives nutrition from the mother and grows into a complete organism.
- It then detaches from the mother and lives individually. For eg., hydra

Fragmentation

If a part of an organism is cut and detached from the organism it grows into an individual organism. For eg., planaria

Q.2. Explain the process of gametogenesis in animals with suitable examples.

A.2. The biological process for the formation of gametes, i.e., the production of sperms and oocytes is known as gametogenesis. The process for the formation of sperms is known as spermatogenesis and that for oocytes is known as oogenesis.

Spermatogenesis

- Testosterone and Follicle Stimulating Hormones are involved in the process.
- Mitosis and meiosis take place in the seminiferous tubules of the testis which helps in the formation of spermatozoa.
- Spermatogonia undergo mitosis and produce diploid primary spermatocytes.
- The primary spermatocytes divide into two secondary spermatocytes during the first mitosis.
- The secondary spermatocytes further divide by meiosis and form four spermatids.
- Spermatids differentiate into functional sperms by a process called the spermiogenesis.

Oogenesis

- Estrogen, follicle-stimulating hormone, luteinizing hormone and progesterone are involved in the process.
- Primordial follicles of ovaries transform into oogonia and produce diploid primary oocytes.
- Primary oocytes undergo meiosis to form ootids. These get arrested at prophase I
- On reaching puberty, the primary oocytes undergo meiosis and form haploid secondary oocytes and a polar body which disintegrates later.
- The secondary oocytes get arrested at metaphase II.
- If the egg gets fertilized the meiosis gets completed forming a polar body and an ootid.
- The ovum matures and the polar bodies disintegrate.

Q.3. State the differences between:

1. **Oestrous and menstrual cycle**
2. **Ovipary and vivipary**

A.3. 1.

Oestrous Cycle	Menstrual Cycle
Occurs in non-primates such as cows, dogs.	Occurs in primates such as humans, monkeys, apes.
The oestrous period is short in for eg., it is 12-24 hours in cows.	The cycle comprises of menstrual phase, proliferative phase and the secretory phase.
The cycle does not involve blood flow.	Blood flows in the last few days of the cycle.
Broken endometrium is reabsorbed.	Broken endometrium sheds during menstruation.
Copulation urge increases only during the oestrous period.	Copulation is not permitted by females during the menstrual phase.

Ovipary	Vivipary
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Animals lay eggs.	Animals give birth.
The zygote develops outside the body of the female.	The zygote develops inside the female reproductive tract.
The eggs are laid in water or moist land and the chances of survival are less.	The chances of survival of the newborn are more because it is developed inside the female.

Q.4. Rose plants have large flowers but rarely do they produce fruits. On the contrary, the tomato plant produces fruit but has very small flowers. Comment with suitable reasons.

A.4. Rose plants do not produce fruits due to the following reasons:

- No fertilization takes place in a rose flower due to the absence of viable pollen.
- The eggs produced are non-functional.
- They are self-incompatible.
- The ovule is defective and non-functional.
- Since rose plants reproduce vegetatively, they might be sterile.

Q.5. List the important differences between zoospore and zygote.

A.5. Following are the important differences between zoospore and zygote:

Zoospore	Zygote
This structure is associated with asexual reproduction.	This structure is associated with sexual reproduction.
It is thin-walled.	It is thick-walled and helps to resist any damage and desiccation.
It has flagella for locomotion.	It is non-motile
It is formed during favourable conditions and germinates immediately.	It undergoes a period of dormancy in algae and fungi.

Q.6. What are the post-fertilization changes that occur in plants?

A.6. The post-fertilization changes that occur in plants include:

1. **Development of Endosperm:** The endosperm cell divides to form a triploid endosperm tissue. The cells have reserve food material that provides nutrition to the developing embryo.
2. **Embryo Development:** The zygote divides only after a certain amount of endosperm is formed. The endosperm provides nutrition for development.
3. **Development of Seed:** The ovule gets transformed into a seed after double fertilization.
4. **Fruit Formation:** Fruits are formed by cell division and differentiation in the ovary. The wall of the ovary develops into the wall of the fruit.

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