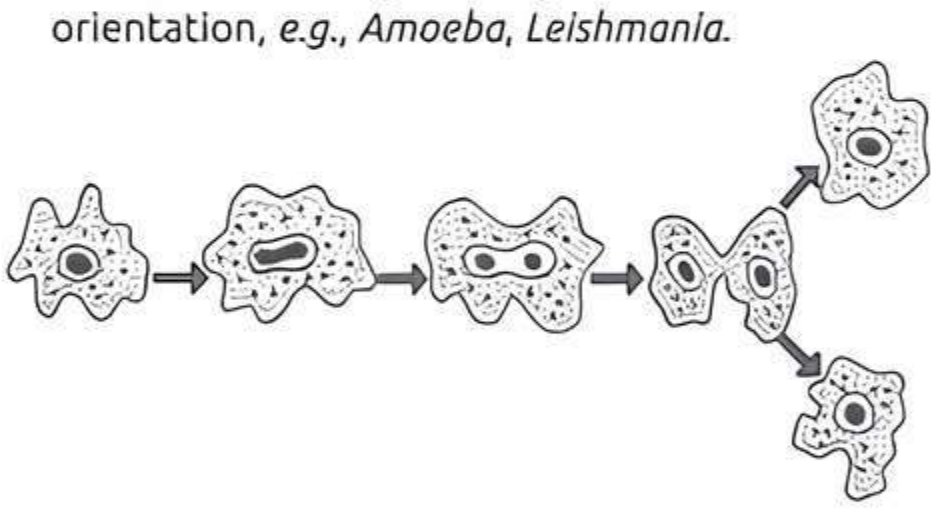
7 How Do Organisms Reproduce?

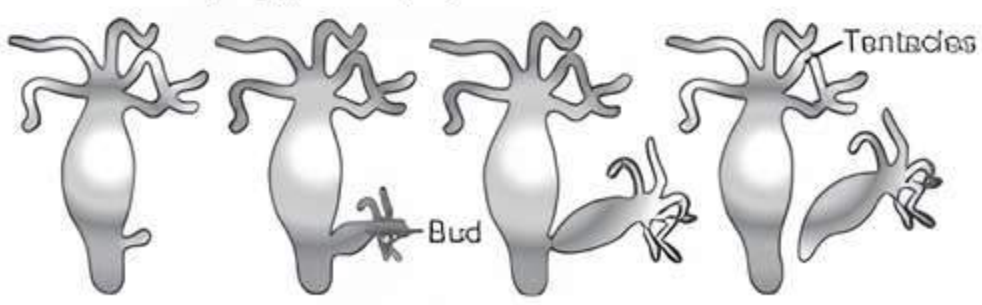
Fastrack Revision

- **Reproduction:** It is the process of producing new organisms from the existing organisms of the same species. It is vital for the existence and continuity of the species. Reproduction involves the creation of DNA copy that leads to variations and it serves as the basis for evolution. There are two modes of reproduction in living organisms—asexual and sexual reproduction.
  - **Asexual Reproduction:** It is the production of offspring by a single parent without the formation and fusion of gamete. It is extremely useful as a means of rapid multiplication and is common in lower plants and animals. *e.g.*, Binary fission in *Amoeba*, Budding in *Hydra*, etc.
    - **Fission:** It is the splitting of a unicellular organism into two or more than two separate daughter cells. Fission can be binary and multiple.
      - **(a) Binary Fission:** In it, parent organism divides into two identical daughter organisms with definite orientation, *e.g.*, *Amoeba*, *Leishmania*.



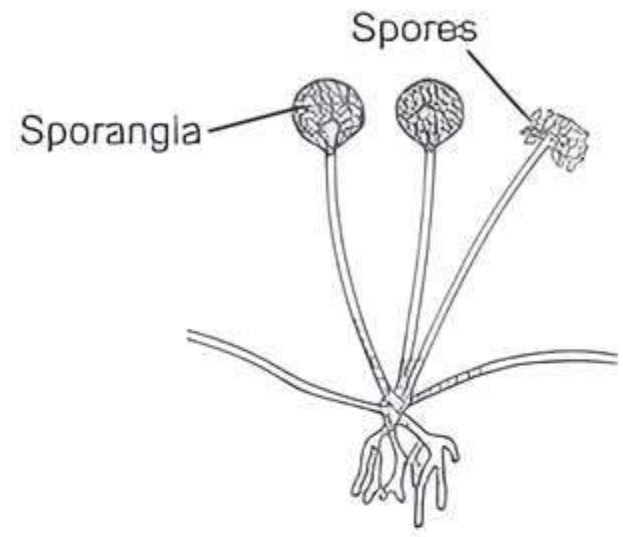
Binary Fission in *Amoeba*

      - **(b) Multiple Fission:** In it, parent organism divides into many identical daughter organisms, *e.g.*, *Plasmodium*.
    - **Budding:** In this process, a daughter organism is formed at one specific site known as bud, which develops as an outgrowth due to repeated cell division on the parent body. When fully mature, it detaches from the parent body and becomes a new individual, *e.g.*, *Yeast*, *Hydra*.



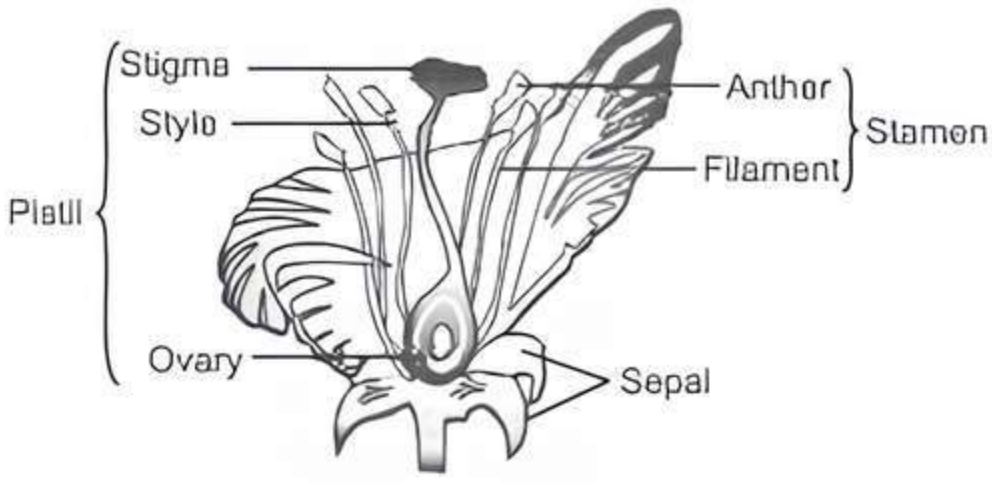
Budding in *Hydra*

    - **Regeneration:** It is the ability of a fully differentiated organism to give rise to new individual organism from its body part. *e.g.*, *Hydra*, *Planaria*.
    - **Spore Formation:** In it, a parent plant produces hundreds of microscopic reproductive units called 'spores', which germinate and produce new plants *e.g.*, *Rhizopus* , *Mucor*, etc.



Spore Formation in *Rhizopus*

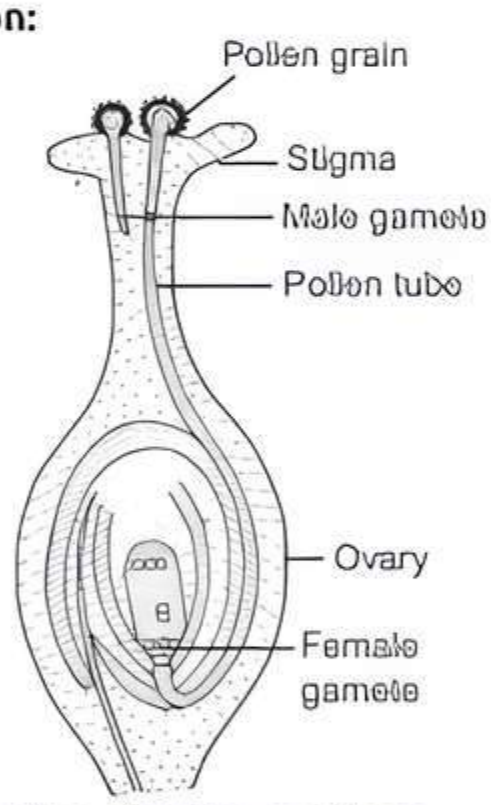
    - **Fragmentation:** In it, the body of a simple multicellular organism breaks into two or more pieces upon maturation. The pieces or fragments grow into new individuals, *e.g.*, *Spirogyra* and Sea anemones.
    - **Vegetative Propagation:** In it, new plants are obtained from the vegetative parts like stems, roots and leaves under appropriate conditions. There are two methods of vegetative propagation– natural (by roots, stems and leaves) and artificial (grafting, cutting, layering and tissue culture).
    - **Advantages of Vegetative Propagation:**
      (i) Plants bear flowers and fruits earlier by those propagated sexually.
      (ii) Plants which have lost the capacity to produce seeds can reproduce by vegetative propagation.
      (iii) All plants produced are genetically similar to the parent plant.
  - **Sexual Reproduction:** It is a type of reproduction in which the two sexes, *i.e.*, male and female are involved. Both sexes produce gametes, namely, male gamete or sperm and female gamete or ova. Thus, it involves two major processes, *i.e.*, formation of gametes and fusion of gametes (fertilisation).
    - **Significance of Sexual Reproduction:**
      (i) Error in DNA copying mechanism leads to variations in populations which ensures the survival of the species.
      (ii) It involves re-establishment of the number of chromosomes and the DNA content in the new generation. This is achieved by a process of cell division called meiosis.
  - **Sexual Reproduction in Flowering Plants:** A typical flower consists of sepals, petals, stamens and pistil. Stamen is the male reproductive part and produce pollen grains that contain male gamete. Pistil (carpel) is the female reproductive part which consists of swollen bottom part ovary, middle elongated part style and sticky terminal stigma. Ovary contains ovules and each ovule has an egg cell (female gamete).



Longitudinal Section of Flower

A flower is said to be unisexual if it contains either stamens or pistil whereas if it contains both stamens and pistil, it is called bisexual. Papaya and watermelon are unisexual whereas mustard and hibiscus are bisexual flowers.

- **Pollination:** The transfer of pollen grains from the anther of the stamen to the stigma of a flower is termed as Pollination. It is of two types, *i.e.*, self-pollination and cross-pollination. If the pollen grains fall on the stigma of the same flower, it is called as self-pollination. If the pollen grains are transferred to the stigma of a different flower, it is called as cross-pollination. It is achieved by agents like wind, water or animals.
- **Fertilisation:**



Germination of pollen on stigma

A tube grows out of pollen grain containing two male gametes and travels through the style to reach the female gamete present in ovule in the ovary. Out of the two, one male gamete fuses with the female gamete to form a zygote. This fusion is called fertilisation. Afterwards, zygote divides several times to form embryo inside ovule, the ovule turns into a seed and the ovary grows and ripens to form a fruit. Fruits consist of seeds which is the reproductive unit of a plant.

- **Sexual Reproduction in Humans:** In human beings, sexual reproduction can occur only after the onset of puberty. It is the time period when our body begins to develop and the reproductive organs in males and females attain maturity.
  - **Male Reproductive System:** It consists of testes, vas deferens, penis, urethra and associated glands.
  - **Female Reproductive System:** It consists of ovary, oviduct or fallopian tube, uterus and vagina.

MNEMONICS

Concept : *Parts of Female Reproductive System*
Mnemonics : ***O****ur* ***F****ather is* ***V****ery* ***U****nderstanding.*
Interpretation : *Ovary, Fallopian Tube, Vagina, Uterus*

- **Fertilisation in Humans:** After copulation, the sperms reach the fallopian tube where the ovum is present and fertilisation takes place to form a zygote which starts dividing for a period of nine months called the gestation period. Then a strong rhythmic muscular contraction in the uterus leads to childbirth. The embryo or zygote gets nutrition from the mother's blood with the help of a special tissue called placenta.
- **Menstruation:** If fertilisation does not take place, then the process of menstruation occurs in females. It is the breakdown and removal of the thick, spongy lining of uterus in the form of vaginal bleeding. This cycle takes place every month or at a regular interval of 28 days and usually lasts for about 2-8 days.
- **Menopause:** It is the stage that marks the end of menstruation in women at the age of 45 to 50 years. After this stage, the ovaries do not release eggs.
- **Birth Control:** A number of methods or techniques have been developed to prevent and control pregnancy. These methods are:
  (i) **Barrier:** Condom, Diaphragm, Intra-uterine Contraceptive Device (IUCD).
  (ii) **Chemical:** Oral contraceptive pills, vaginal pills.
  (iii) **Surgical:** Vasectomy, tubectomy.
- **Sexually Transmitted Diseases (STDs):** These are diseases which spread by sexual contact from an infected person to a healthy person or through sexual routes. The most common ones are bacterial infections such as gonorrhoea, syphilis and viral infections such as genital warts and HIV-AIDS. An important benefit in the use of condom is that it protects a person from STDs.

Practice Exercise

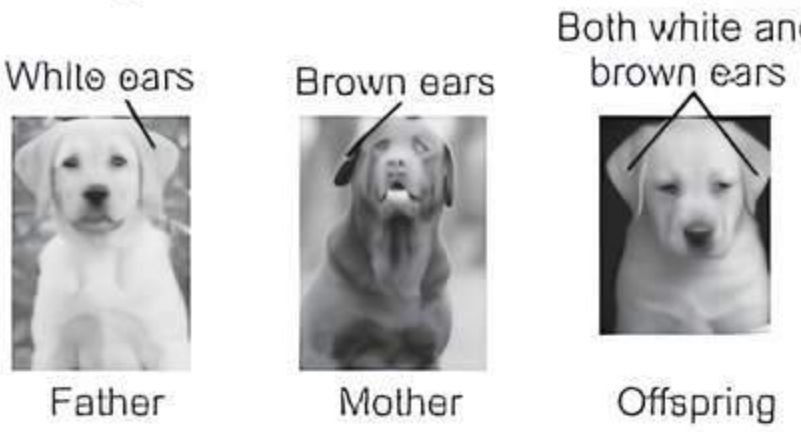
Multiple Choice Questions

Q 1. Which one of the given statements is incorrect:

(CBSE 2023)

a. DNA has the complete information for a particular characteristic.
b. DNA is the molecule responsible for the inheritance of characters from parents to offsprings.
c. Change in information will produce a different protein.
d. Characteristics will remain the same even if protein changes.

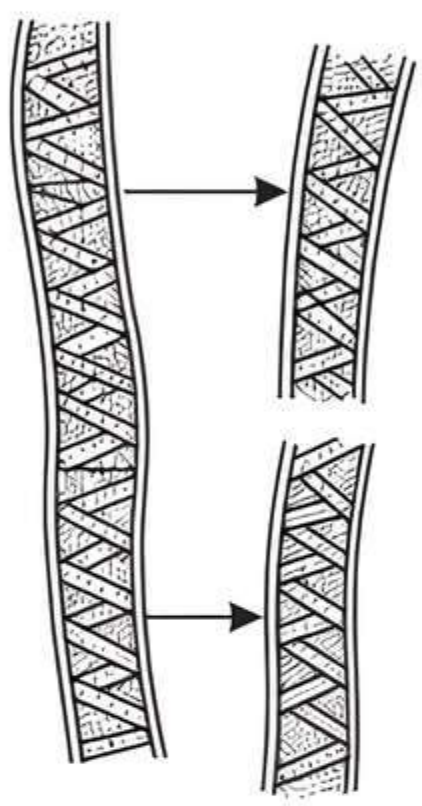
Q 2. The image shows the model of a family of dogs.



It can be observed that the offspring is similar to the parent but not identical. What is the likely reason for this?

a. Variation in the genetic material
b. Fast multiplication of body cells
c. Asexual mode of reproduction
d. Effect of environment on the offspring

Q 3. The image shows the division in *Spirogyra*.



What can be concluded about the *Spirogyra* from this division?

a. It is a multicellular organism gives rise to two new equal sized individuals.
b. It is a unicellular organism that gives rise to two new equal sized individuals.
c. It is a unicellular organism that breaks into pieces that grows into new individuals.
d. It is a multicellular organism that breaks into pieces that grows into new individuals.

Q 4. A farmer wants to grow banana plants genetically similar enough to the plants already available in his field. Which one of the following methods would you suggest for this purpose?

(CBSE SQP 2023-24)

a. Regeneration
b. Budding
c. Vegetative propagation
d. Sexual reproduction

Q 5. Choose the correct statement(s) on budding in *Hydra* from the following:

I. A parent cell divides into two or more daughter cells and here the parent identity is lost.
II. In this, the elongated nucleus divides to form two or more daughter nuclei.
III. A bud arises from a particular region on a parent body.
IV. After detaching from the parent body, the bud grows into a new independent individual.

(CBSE 2017)

a. Only I b. Only III c. II and III d. III and IV

Q 6. The number of chromosomes in parents and offsprings of a particular species undergoing sexual reproduction remain constant due to:

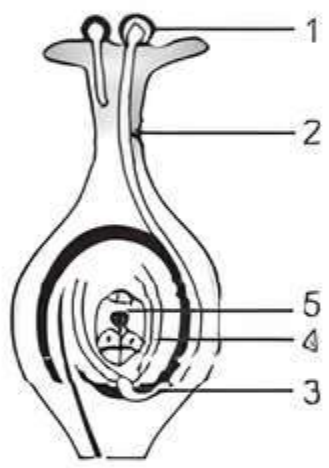
(CBSE 2023)

a. doubling of chromosomes after zygote formation
b. halving of chromosomes after zygote formation
c. doubling of chromosomes before gamete formation
d. halving of chromosomes at the time of gamete formation

Q 7. Plants which bear unisexual flowers are: *(CBSE 2023)*

a. Mustard and Papaya
b. Hibiscus and Watermelon
c. Mustard and Hibiscus
d. Watermelon and Papaya

Q 8. The diagram shows the cross-section through the carpel of a flower just before fertilisation:



Where will the male and female gametes be just before fertilisation?

	Male gamete	Female gamete
a.	1	5
b.	1	4
c.	2	4
d.	3	5

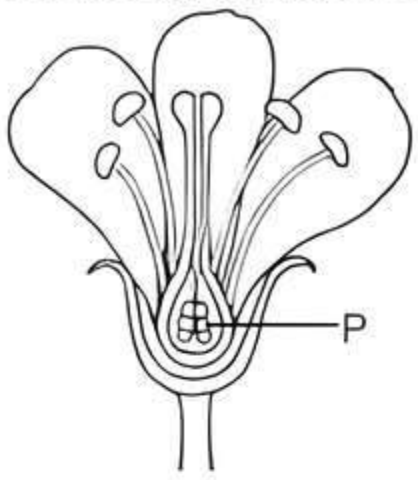
Q 9. Seeds are called products of sexual reproduction because they: *(CBSE 2020)*

a. give rise to new plants
b. are formed by fusion of gametes
c. are formed by the fusion of pollen tubes
d. can survive for a longer period

Q 10. Fertilisation is the process of: *(CBSE 2020)*

a. transfer of male gamete to female gamete
b. fusion of nuclei of male and female gametes
c. adhesion of male and female reproductive organs
d. the formation of gametes by a reproductive organ

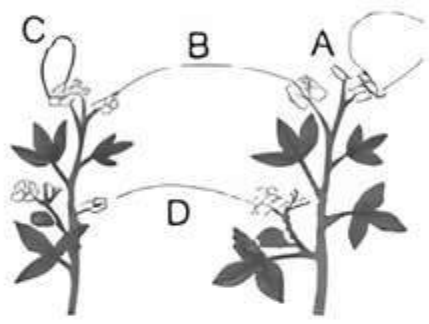
Q 11. The image shows the structure of a flower.



Which process will likely be disturbed or not occur, if labelled part is removed from the flower?

a. Formation of fruit
b. Transport of pollen
c. Formation of pollen
d. Development of pollen tube

Q 12. **The diagram shown below depicts pollination. Choose the options that will show a maximum variation in the offspring.** *(CBSE SQP 2022-23)*



a. *A*, *B* and *C*
b. *B* and *D*
c. *B*, *C* and *D*
d. *A* and *C*

Q 13. **Which option correctly lists the changes that occur in males during puberty?**

a. ● thick hairs grow on face
   ● cracking of voice
   ● enlargement of reproductive organ
b. ● reproductive organs enlarge
   ● size of the breasts increases
   ● thick hairs grow on the body
c. ● thin hairs growth occurs on the body
   ● size of the breasts increases
   ● pitch of the voice increases
d. ● size of the breasts increases
   ● beginning of menstruation
   ● thick hairs grow on the body

Q 14. **During adolescence, reproductive phase starts and:** *(CBSE 2023)*

a. general growth rate begins to slow down
b. height becomes less
c. the body weight is reduced
d. hair growth decreases

Q 15. **The correct sequence of organs in the male reproductive system for transport of sperms is:** *(NCERT EXEMPLAR)*

a. testis → vas deferens → urethra
b. testis → ureter → urethra
c. testis → urethra → ureter
d. testis → vas deferens → ureter

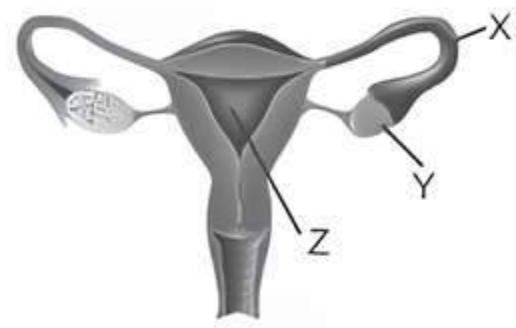
Q 16. **The table lists some changes that occur inside the female body after fertilisation of egg with sperm:**

(i) Rhythmic contractions of uterus muscle for child birth
(ii) Formation of placenta
(iii) Implantation of embryo
(iv) Development of organs in foetus
(v) Cell division of zygote

Which option correctly sequences these events?

a. (iii)-(ii)-(v)-(i)-(iv)
b. (v)-(iii)-(iv)-(ii)-(i)
c. (v)-(iii)-(ii)-(iv)-(i)
d. (iii)-(v)-(i)-(ii)-(iv)

Q 17. **The diagram shows a section through the female reproductive system:**

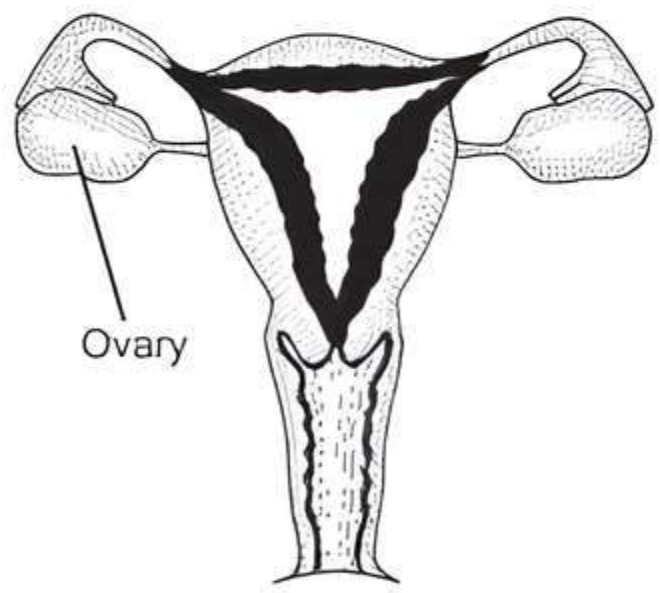


During pregnancy, where does mitosis occur in the cells of the embryo?

	X	Y	Z
a.	✓	✓	✓
b.	✓	✓	✗
c.	✓	✗	✓
d.	✗	✗	✓

Key ✓ = takes place, ✗ = does not take place.

Q 18. **The image shows the reproductive organ in females.**



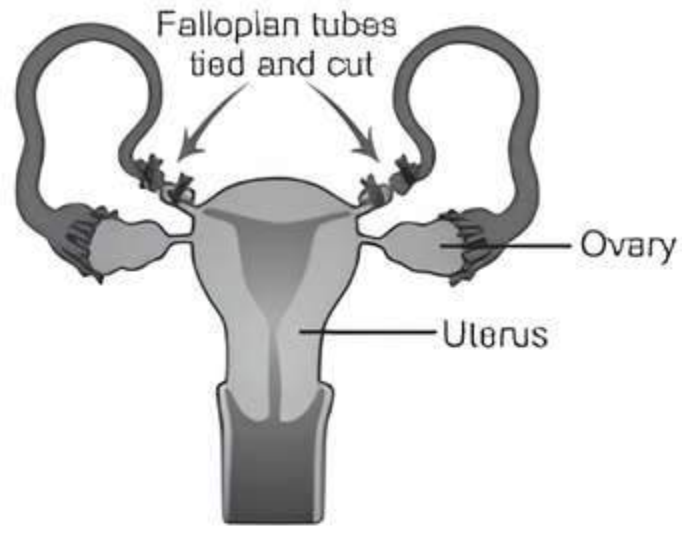
Which event will likely occur in the ovaries of females after attaining puberty?

a. Fertilisation
b. Synthesis of eggs
c. Production of eggs
d. Growth and development of embryo

Q 19. **Which among the following diseases is not sexually transmitted?** *(NCERT EXEMPLAR)*

a. Hepatitis
b. Syphilis
c. HIV-AIDS
d. Gonorrhoea

Q 20. The image shows a surgical method in females to prevent pregnancy.



Which event will be likely prevented from this method?

a. Maturation of eggs
b. Production of eggs
c. Entry of eggs into the uterus
d. Entry of sperm into the uterus

Assertion & Reason Type Questions

Directions (Q. Nos. 21-30): *Each of the following questions consists of two statements, one is Assertion (A) and the other is Reason (R). Give answer:*

a. Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).
b. Both Assertion (A) and Reason (R) are true but Reason (R) is not a correct explanation of Assertion (A).
c. Assertion (A) is true but Reason (R) is false.
d. Assertion (A) is false but Reason (R) is true.

Q 21. Assertion (A): *Amoeba* always produces two daughter amoebae while *Plasmodium* divides into many daughter cells.

Reason (R): *Amoeba* undergoes binary fission while *Plasmodium* undergoes multiple fission. *(CBSE 2020)*

Q 22. Assertion (A): When a bacterium divides into two, and the resultant two bacteria divide again, the four bacteria produced would be almost similar.

Reason (R): DNA copying involves small inaccuracies in the reproduction process.

(CBSE 2023)

Q 23. Assertion (A): Regeneration is getting a full organism back from its body parts.

Reason (R): *Hydra* and *Planaria* show regeneration.

Q 24. Assertion (A): The transfer of pollen grains from the anther of a stamen to the stigma of a carpel is called pollination.

Reason (R): Pollination is done by insects, birds, wind and water.

Q 25. Assertion (A): Probability of survival of an organism produced through sexual reproduction is more than that of organism produced through asexual mode.

Reason (R): Variations provide advantages to individual for survival. *(CBSE SQP 2023-24)*

Q 26. Assertion (A): Testes are located outside the abdominal cavity in the scrotum.

Reason (R): Because sperm formation requires lower temperature than the normal body temperature. *(CBSE 2020)*

Q 27. Assertion (A): The uterine line in human females becomes thick and spongy every month.

Reason (R): The lining breaks and comes out through the vagina as blood and mucus if fertilisation does not occur.

Q 28. Assertion (A): The embryo gets nutrition from the mother's blood with the help of a special tissue called placenta.

Q 29. Assertion (A): Condom protects a person from STDs.

Reason (R): Condom prevents the sperms from meeting the ovum by acting as a barrier.

Q 30. Assertion (A): Vasectomy is a surgical method of contraception.

Reason (R): In vasectomy, woman's oviduct are tied, blocked or cut.

Answers

1. (d) Characteristics will remain the same even if protein changes.
2. (a) Variation in the genetic material
3. (d) In fragmentation, multicellular organisms like *Spirogyra*, breaks up into smaller pieces upon maturation. These pieces or fragments grow into new individuals.
4. (c) Plants such as banana, orange, rose and jasmine that have lost the capacity to produce seeds are reproduced through vegetative propagation.
5. (d) III and IV
6. (d) halving of chromosomes at the time of gamete formation
7. (d) Watermelon and Papaya
8. (d) Male gamete 3 Female gamete 5
9. (b) are formed by fusion of gametes
10. (b) fusion of nuclei of male and female gametes
11. (a) The labelled part is ovule. Removal of ovule results in failure of fertilisation. We know that without fertilisation, formation of fruit will not take place.
12. (b) B and D
13. (a) Change in size of breasts and beginning of menstruation are changes that occur in females during puberty.
14. (a) general growth rate begins to slow down
15. (a) testis → vas deferens → urethra
16. (c) (v)-(iii)-(ii)-(iv)-(i)

17. (c) ✓ ✗ ✓
18. (c) Production of eggs
19. (a) Hepatitis
20. (c) In tubectomy, a small portion of oviduct or fallopian tube is cut and tied properly. The fallopian tube in the female gets blocked and the egg will not be able to reach the uterus and thus fertilisation will not take place.
21. (a) Both Assertion (A) and Reason are true and Reason (R) is correct explanation of Assertion (A).
22. (b) Both Assertion (A) and Reason are true, but Reason (R) is not the correct explanation of Assertion (A).
23. (b) Both Assertion (A) and Reason are true, but Reason (R) is not the correct explanation of Assertion (A).
24. (a) Both Assertion (A) and Reason are true but Reason (R) is not the correct explanation of Assertion (A).
25. (a) Both Assertion (A) and Reason (R) are true and Reason (R) is correct explanation of the Assertion (A).
26. (a) Both Assertion (A) and Reason are true and Reason (R) is correct explanation of Assertion (A).
27. (b) Both Assertion (A) and Reason are true, but Reason (R) is not the correct explanation of Assertion (A).
28. (b) Both Assertion (A) and Reason are true but Reason (R) is not the correct explanation of Assertion (A).
29. (b) Both Assertion (A) and Reason are true but Reason (R) is not the correct explanation of Assertion (A).
30. (c) Reason (R) is false because in vasectomy, small portion of the sperm duct is cut or tied properly.

Case Study Based Questions ↘

Case Study 1

All the reproductive methods of living organisms are broadly categorized into two types: 1. Asexual reproduction, and 2. Sexual reproduction.
Asexual reproduction involves the participation of a single parent without the formation of gametes, fertilisation and transfer of genetic material. This method is a common means of rapidly increasing offsprings under favourable conditions.

Read the above passage carefully and give the answer of the following questions:

Q 1. Name the type of fission that occurs in Leishmania and Plasmodium.

Q 2. Write one advantage of sexual mode of reproduction over asexual reproduction.

Q 3. Give reasons why:

(i) Colonies of yeast fail to multiply in water but multiply in sugar solution.

(ii) Rhizopus individuals do not grow on a dry slice of bread.

Or

Name the filamentous structures a student could identify when he collected water from a pond that appeared dark green. How do these organisms multiply? Explain. *(CBSE 2023)*

Answers

1. Leishmania — Binary fission
   Plasmodium — Multiple fission
2. Organisms produced by sexual reproduction have a greater survival rate as compared to asexual reproduction as more variations are produced which are important for the survival of species over time.
3. (i) Yeast cells fail to multiply in water because water does not provide any nutrition to yeast cells. Whereas in sugar solution, they multiply rapidly because sugar provides nutrition to carry out reproduction.
   (ii) Rhizopus individuals do not grow on a dry slice of bread because microorganisms need optimum temperature and moisture to grow and if there is no moisture they will not grow.

Or

The filamentous structures are of Spirogyra.
Reproduction in Spirogyra: Spirogyra reproduces through fragmentation in which spirogyra filaments simply breaks into two or more fragments on maturation and each fragment then grows into a new spirogyra individual.

Case Study 2

The modes by which various organisms reproduce depend on the body design of the organisms. In asexual reproduction, a single individual parent produces offsprings without the involvement of gametes. This method is a common means of increasing the offsprings rapidly under favourable conditions. Asexual reproduction occurs mostly in unicellular organisms, some plants and certain simple multicellular animals. *(CBSE 2022 Term-2)*

Read the above passage carefully and give the answer of the following questions:

Q 1. State the name of the organism in which binary fission takes place in a definite orientation. Also name the disease caused by this organism.

Q 2. Leaves of 'Bryophyllum' when they fall on the soil develop into new plants whereas a banana leaf will not be able to do so. Why?

Q 3. (i) Explain the process of budding in *Hydra*.

Or

(ii) What happens when
(a) a *spirogyra* filament matures and attains a considerable length and
(b) a sporangia in Rhizopus bursts on maturation?

Answers

1. In *Leishmania* binary fission takes place in a definite orientation. It causes kala-azar.
2. The leaves of Bryophyllum have buds in their margins (or edges). When these leaves fall on the ground, the buds develop into a new plant by process of vegetative reproduction. The leaves of banana don't produce any buds and hence cannot produce new plants.

3. (I) Hydra use regenerative cells for reproduction in the process of budding. In *Hydra*, bud develops as an outgrowth due to repeated cell division at one specific site. These buds develop into tiny individuals and when fully mature, detach from parent body and become new independent individuals.

Or

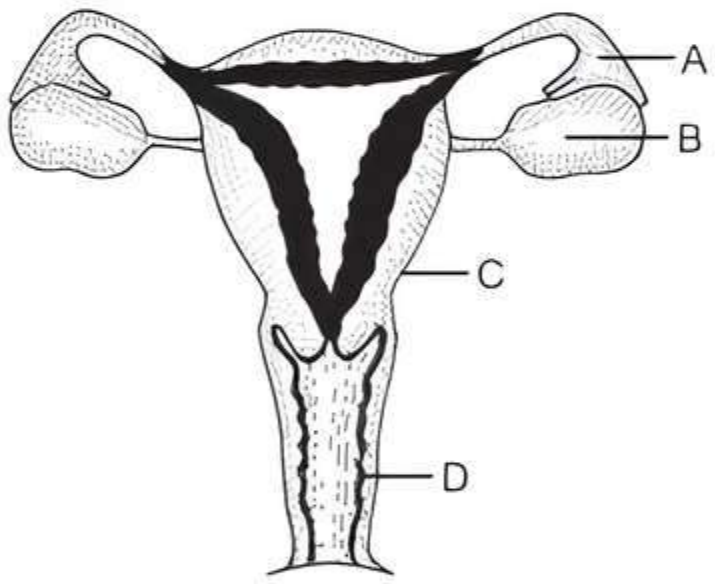
(ii) (a) A mature *Spirogyra* breaks into smaller pieces or fragments and each fragment then develops into new individuals.

(b) When the sporangia of *Rhizopus* bursts upon maturation, the spores spread out. Under favourable conditions, these spores germinate to form new individuals.

Case Study 3

The female reproductive system includes the ovaries, fallopian tubes, uterus, vagina and mammary glands. These organs are involved in the production and transportation of gametes and the production of sex hormones. The female reproductive system also facilitates the fertilisation of ova by sperm and supports the development of offspring during pregnancy and infancy.

Read the above passage carefully and give the answer of the following questions:



Q 1. In which part do the sperms enter?

Q 2. In which part does fertilisation take place?

Q 3. In which part does the foetus develop?

Q 4. Which structures in human female are equivalent to the following structures in the male?

(i) Testes

(ii) Vas deferens

In each case say in what respect the structures are equivalent?

Q 5. Mention one function of part B.

Answers

1. Part D (vagina)
2. Part A (oviduct)
3. Part C (uterus)
4. (i) Ovaries in female: both make gametes.

   (ii) Oviducts in female: both transport gametes.
5. The function of ovary (part B) is to generate and release female gametes, *i.e.*, the eggs.

Case Study 4

The growing size of the human population is a cause of concern for all people. The rate of birth and death in a given population will determine its size. Reproduction is the process by which organisms increase their population. The process of sexual maturation for reproduction is gradual and takes place while general body growth is still going on. Some degree of sexual maturation does not necessarily mean that the mind or body is ready for sexual acts or for having and bringing up children. Various contraceptive devices are being used by human beings to control the size of population. *(CBSE 2020)*

Read the above passage carefully and give the answer of the following questions:

Q 1. List two common signs of sexual maturation in boys and girls.

Q 2. What is the result of reckless female foeticide?

Q 3. What is contraception?

Q 4. Which contraceptive method changes the hormonal balance of the body?

Q 5. Write two factors that determine the size of a population.

Answers

1. Two common signs of sexual maturation in boys and girls are as follows:

   (I) Appearance of hairs on various body parts such as armpits and the genital area between the thighs.

   (ii) The skin frequently becomes oily and might begin to develop pimples.
2. Because of reckless female foeticides, child sex ratio is declining at an alarming rate in our society.
3. Any method which prevents conception or pregnancy is called contraception.
4. Chemical method of contraception (oral pills) changes the hormonal balance of the body.
5. The rates of birth and death in a given population determine its size.

Very Short Answer Type Questions

Q 1. Name the life process of an organism that helps in the growth of its population. *(CBSE 2015)*

Ans. Reproduction is the life process that helps in the growth of population of an organism.

Q 2. When a cell reproduces, what happens to its DNA? *(CBSE 2017)*

Ans. When a cell reproduces, its DNA replicates *i.e.* two copies of DNA are produced.

Q 3. Newly formed DNA copies may not be identical at times. Give one reason. *(CBSE 2017)*

Ans. Newly formed DNA copies may not be identical if there is error in DNA copying.

Q 4. Why is variation important for a species? *(CBSE 2017)*

Ans. Variation is important because it increases the chance of survival of species in the newly changed environment.

Q 5. Name the causative agent of the disease 'Kala-azar' and its mode of asexual reproduction. *(CBSE 2015)*

Ans. The causative agent of the disease 'Kala-azar' is *Leishmania*. It reproduces by binary fission.

Q 6. How does *Plasmodium* reproduce? Is this method sexual or asexual? *(CBSE 2017)*

Ans. *Plasmodium* reproduces by multiple fission. It is an asexual method of reproduction.

Q 7. What happens when a mature *Spirogyra* filament attains considerable length? *(CBSE 2016)*

Ans. When a mature *Spirogyra* filament attains considerable length, it breaks into smaller pieces or fragments and each fragment then grows into a new plant.

Q 8. Name two simple organisms having the ability of regeneration. *(CBSE 2015)*

Ans. *Hydra* and *Planaria* have the ability of regeneration.

Q 9. Regeneration is not possible in all types of animals. Why?

Ans. Regeneration is carried out by specialised cells. The organisms which have those cells only can show regeneration.

Q 10. What is vegetative propagation? List its two methods. *(CBSE 2019)*

Ans. In vegetative propagation, new plants are obtained from the vegetative parts (stem, leaves, roots etc.) of the plant under appropriate conditions. Layering and grafting are its two methods.

Q 11. What happens when *Bryophyllum* leaf falls on the wet soil? *(CBSE 2017)*

Ans. When *Bryophyllum* leaf falls on the wet soil, the buds that are produced in the notches along the leaf develop into new plants by vegetative propagation.

Q 12. Give an example of a flower which contains both stamens and carpels.

Ans. Hibiscus/Mustard contains both stamens and carpels.

Q 13. Name the parts of a bisexual flower that are not directly involved in reproduction. *(CBSE 2015)*

Ans. Sepals and petals of bisexual flowers are not directly involved in reproduction.

Q 14. Differentiate between pollen grain and ovule.

Ans.

Basis of Difference	Pollen Grain	Ovule
(I) Gametes	Pollen grains contain male gametes.	Ovules contain female gametes.
(II) Location	It is found in the anther of stamen.	It is found inside the ovary of pistil of a flower.

Q 15. Differentiate between fertilisation and germination.

Ans.

Basis of Difference	Fertilisation	Germination
Definition	It refers to the fusion of male and female gametes.	It refers to the development of embryo into a seedling under appropriate conditions.

Q 16. Where is the zygote located in the flower after fertilisation? *(NCERT EXEMPLAR)*

Ans. Zygote is located inside the ovule which is present in the ovary.

Q 17. State the basic requirement for sexual reproduction. *(CBSE 2017)*

Ans. The basic requirement for sexual reproduction is the involvement of two parents and the fusion of their gametes.

Q 18. List two secondary sexual characters of males that are different from that of females.

Ans. Secondary sexual characters of males are:
(i) Growth of beard and moustaches.
(ii) Voice begins to crack.

Q 19. Name the organs in humans which produces (i) male germ cell and (ii) female germ cell. *(CBSE 2017)*

Ans. (i) Testis (ii) Ovary

Q 20. Why is the temperature of scrotal sac less than body temperature?

Ans. Because formation of sperm requires a temperature lower than that of the normal body temperature.

Q 21. What is fertilisation? Where does it occur in a human female?

Ans. The fusion of male and female gametes is called fertilisation.
Oviduct or fallopian tubes are the site of fertilisation in a human female.

Q 22. Why does the lining of uterus become thick and spongy every month?

Ans. The lining of uterus becomes thick and spongy to receive and nurture the growing embryo.

Q 23. What changes are observed in the uterus if fertilisation does not occur? *(NCERT EXEMPLAR)*

Ans. When egg is not fertilised, then menstruation occurs, *i.e.*, the thick and spongy lining of uterus breaks and comes out through the vagina as blood and mucus.

Q 24. Name two infections which can be sexually transmitted in human beings. *(CBSE 2020)*

Ans. Gonorrhoea and HIV-AIDS.

Q 25. What are the benefits of using mechanical barriers during sexual act? *(NCERT EXEMPLAR)*

Ans. Mechanical barrier like condom prevents the sperms from reaching the egg. Thus, it is an effective method to avoid pregnancy. It also prevents transmission of infections during sexual act.

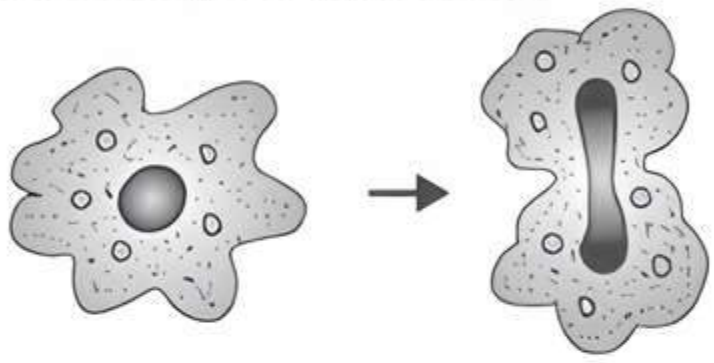
Short Answer Type-I Questions

Q 1. Name the type of asexual reproduction in which two individuals are formed from a single parent and the parental identity is lost. Write the first step from where such a type of reproduction begins. Draw first two stages of this reproduction. *(CBSE 2017)*

Ans. Binary fission is the type of asexual reproduction in which two individuals are formed from a single parent and the parental identity is lost.

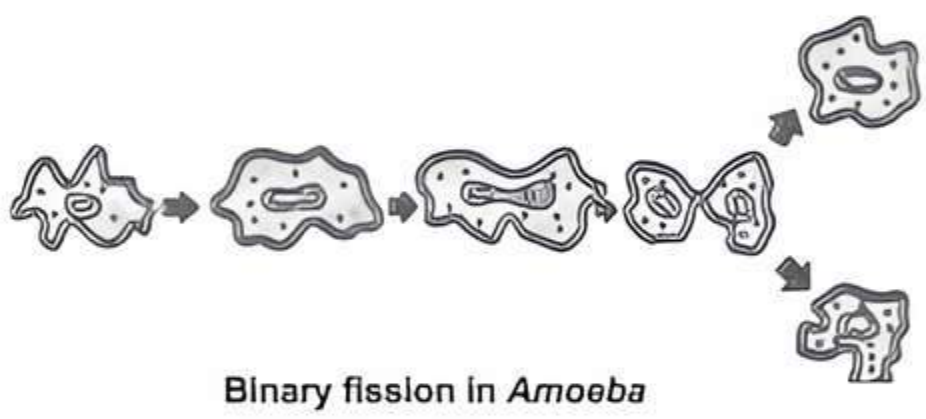
This type of reproduction starts with elongation of cell and its nucleus.

First Two Stages of Reproduction:



Q 2. Name the process by which an *Amoeba* reproduces. Draw the various stages of its reproduction in a proper sequence. *(CBSE 2018)*

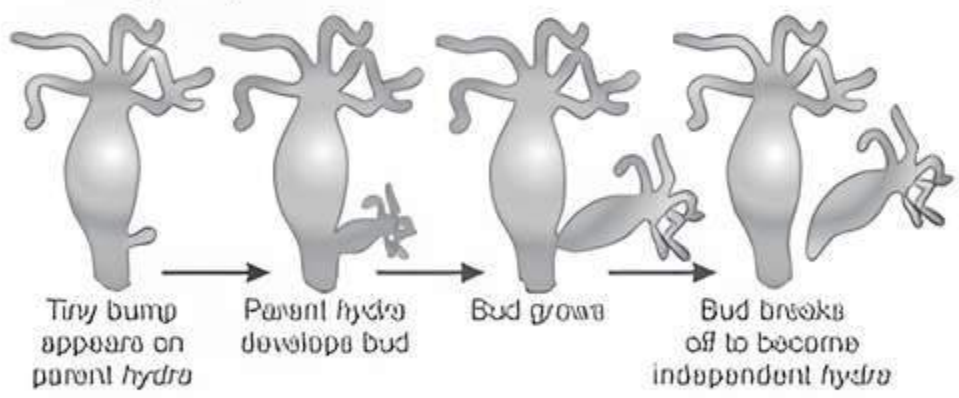
Ans. An *Amoeba* reproduces by binary fission.



Binary fission in *Amoeba*

Q 3. Draw a labelled diagram in proper sequence to show budding in *Hydra*. *(CBSE 2019)*

Ans. Budding in *Hydra*.



Q 4. Give reasons as to why the following processes are different from each other:
(i) Fission in *Amoeba* and *Plasmodium*.
(ii) Binary fission and Fragmentation. *(CBSE 2016)*

Ans. (i) In *Amoeba*, during binary fission, the cell divides into two daughter cells while in *Plasmodium*, multiple fission occurs, where the cell divides into many daughter cells simultaneously.

(ii) In binary fission, a unicellular organism splits into two or more daughter cells while in fragmentation, the body of a multicellular organism breaks up into smaller pieces upon maturation.

Q 5. (i) Name the reproductive and non-reproductive parts of bread mould (*Rhizopus*).
(ii) List any two advantages of vegetative propagation. *(CBSE 2022 Term-2)*

Ans. (i) Reproductive part — Sporangia (blob on a stick structures).
Non-reproductive part — Hyphae (thread-like structures).

(ii) **Advantages of Vegetative Propagation:**
(a) All plants produced are genetically similar to the parent plant.
(b) Plants which have lost the capacity to produce seeds can reproduce by vegetative propagation.

Q 6. List two disadvantages of vegetative propagation. *(CBSE 2017)*

Ans. Disadvantages of vegetative propagation:
(i) There is no genetic variation, so new varieties are not produced.
(ii) The disease of parent plants is transferred to offsprings.

Q 7. Distinguish between unisexual and bisexual flowers giving one example of each.

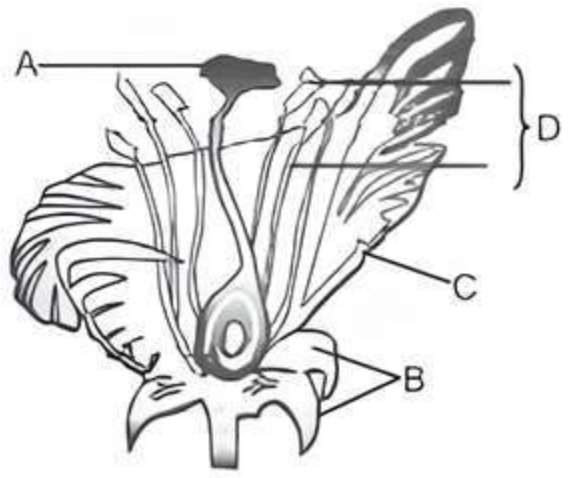
Ans.

Basis of Distinction	Unisexual flower	Bisexual flower
(i) Sex Organs	They have only one type of sex organ, either stamen or pistil.	They have both stamens and pistil.
(ii) Examples	Papaya and watermelon are the examples of this type.	Hibiscus and mustard are the examples of this type.

Q 8. Name the reproductive parts of an angiosperm. Where are these parts located? Explain the structure of its male reproductive part. *(CBSE 2022 Term-2)*

Ans. Stamens and pistils are the reproductive parts of an angiosperm. The reproductive parts of angiosperms are located in the flower. Stamen (male reproductive part) is made up of two parts:
(i) A knob-like terminal called the anther containing pollen grains which are yellowish in colour.
(ii) A stalk-like part that supports anther, called the filament.

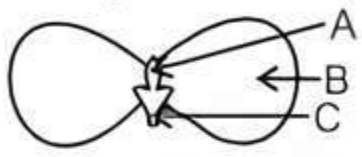
Q 9. (i) In the given diagram, name the parts where (a) pollen grains are produced and (b) pollen grains are transferred.



(ii) What happens to ovule and ovary after fertilisation? *(CBSE 2022 Term-2)*

Ans. (i) (a) D (Anther of stamen)
(b) A (Stigma)
(ii) After fertilisation.
(a) ovule develops a tough coat and is gradually converted into a seed.
(b) ovary grows rapidly and ripens to form a fruit.

Q 10. In the following figure showing a germinating gram seed, name the parts labelled as A, B and C:



Why is part 'B' considered to be important during germination? *(CBSE 2022 Term-2)*

Ans. A is plumule, B is cotyledon and C is radicle.
Part B is considered important because it stores food for the baby plant inside the seed during germination.

Q 11. State the post-fertilisation changes that lead to fruit formation in plants. *(CBSE SQP 2023-24)*

Ans.

TiP

Understand the concept of sexual reproduction in flowering plants carefully and learn the events occurring in them after fertilisation.

Events that take place after fertilisation are as follows:
(i) The zygote divides several times to form an embryo within the ovule.
(ii) The ovule develops a tough coat and is gradually converted into a seed.
(iii) The ovary grows rapidly and ripens to form a fruit.
(iv) The petals, sepals, stamens, style and stigma may shrivel and fall off.

Q 12. Why cannot fertilisation take place in flowers if pollination does not occur? *(NCERT EXEMPLAR)*

Ans. In a flower, fertilisation requires both male and female gametes.
If pollination does not occur, male gamete is not available, hence fertilisation cannot take place.

Q 13. What is puberty? Mention any two changes that are common to both boys and girls in early teenage years. *(CBSE 2022 Term-2)*

Ans. Puberty is the period during which adolescents reach sexual maturity and become capable of reproduction.
Changes common to both boys and girls are:
(i) Thick hair growing in armpits and genital area between the thighs.
(ii) Skin becomes oily and begin to develop pimples.

Q 14. Name the part/organ of the human male reproductive system:
(i) Which is a common passage for both sperms as well as urine?
(ii) Where formation of germ cells or sperms takes place?
(iii) Which is blocked to prevent the transfer of sperm?
(iv) Which provides nutrition to the sperms? *(CBSE 2022 Term-2)*

Ans. (i) Urethra (ii) Testes (iii) Vas deferens (iv) Prostate gland and seminal vesicles.

Q 15. Give reasons:
(i) Placenta is extremely essential for foetal development.
(ii) Uterine lining becomes thick and spongy after fertilisation. *(CBSE 2022 Term-2)*

Ans. (i) Placenta is essential for foetal development because it helps to transport the nutrients from mother's blood to foetus body. It also helps in transferring waste substance generated by foetus into the mother's blood.
(ii) This is required for nourishing the embryo, if fertilisation had taken place.

Q 16. Write the number of immature eggs present in the ovaries of a newly born baby girl. Mention what happen to these immature eggs when the girl attains puberty?

Ans. The ovaries of a newly born baby girl contain thousands of immature eggs.
When the girl attains puberty, some of these eggs start to mature. One egg is produced every month by one of the ovaries.

Q 17. What is the main difference between sperms and eggs of human?

Ans. Sperms are motile in nature and are produced in large numbers by a male.
Eggs are non-motile in nature and only one egg is produced at a time by a female.

Q 18. Suggest any two contraceptive methods to control the size of human population and explain them. *(CBSE 2022 Term-2)*

Ans. Two contraceptive methods are as follows:
(i) **Barrier method or Mechanical method:** This method prevents the meeting of sperms and egg such as condoms on the penis.
(ii) **Oral contraceptive method:** In this method, drugs are taken orally as pills so that eggs are not released and fertilisation cannot occur.

Q 19. (i) State one drawback of each of the following:
(a) Oral contraceptive pills
(b) Copper-T
(ii) Under which category of contraceptive methods, is the use of condom kept? In what way, use is better as compared to other methods of contraception? *(CBSE 2022 Term-2)*

Ans. (i) (a) Oral contraceptive pills change hormonal balances and they can cause side-effects too.
(b) Copper-T can cause side-effects due to irritation of the uterus.
(ii) Condoms are kept under mechanical barriers. Its use is better because it help to prevent the spread of sexually transmitted diseases like HIV etc.

Q 20. List any two reasons why the Government has banned prenatal sex determination by law.

Ans. The two reasons are:
(i) Illegal sex-selective abortion of female foetuses.

(II) Reckless female foeticide has disturbed male-female ratio in the society.

COMMON ERROR

Students write irrelevant stories, so read the question carefully and write only what is asked.

Short Answer Type-II Questions

Q 1. Reproduction is one of the most important characteristics of living beings. Give three reasons in support of the statement. *(CBSE 2017)*

Ans. Reproduction is one of the most important characteristics of living beings because of the following reasons:

(i) It ensures continuation of species.

(ii) It brings about variations in species, thus leading to their evolution.

(iii) The consistency of DNA copying during reproduction is important for the maintenance of body design features. Thus, it ensures stability of population of a species.

Q 2. How do variations arise in organisms? 'Variation is useful for the survival of species'. Justify this statement with the help of an example. *(CBSE 2017)*

Ans. Variations arise in organism because of the following reasons:

(i) Inaccuracies or error in DNA copying during reproduction.

(ii) In sexual reproduction, two genes from two different organisms combine to form a new organism.

Variation is useful for the survival of species because it enables some individuals to adapt to the changing environment and thus give better chances of survival to the species.

For example, a population of bacteria lives in temperate waters. If the temperature of water increases by global warming, then most of the bacteria would die. Only a few variants resistant to heat would survive and grow further.

Q 3. List the two types of reproduction. Which one of the two is responsible for bringing in more variations in its progeny and how? *(CBSE 2017)*

Ans. The two types of reproduction are:

(I) Asexual reproduction.

(ii) Sexual reproduction.

Sexual reproduction is responsible for bringing in more variations in its progeny because of the following reasons:

(a) It involves fusion of male and female gametes from two different organisms or parents.

(b) It involves the process of DNA copying, which is not absolutely accurate and errors result in new variations.

Q 4. Write one main difference between asexual and sexual mode of reproduction. Which species is likely to have comparatively better chances of survival—the one reproducing asexually or the one reproducing sexually? Give reason to justify your answer. *(CBSE 2018)*

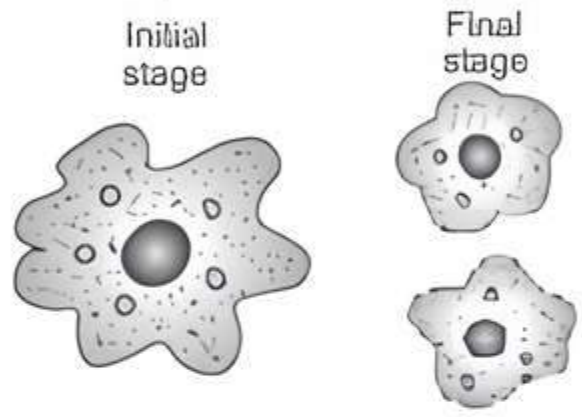
Ans. In asexual mode of reproduction, a single parent is involved but two parents of opposite sex take part in sexual reproduction.

The organism reproducing sexually is likely to have comparatively better chances of survival.

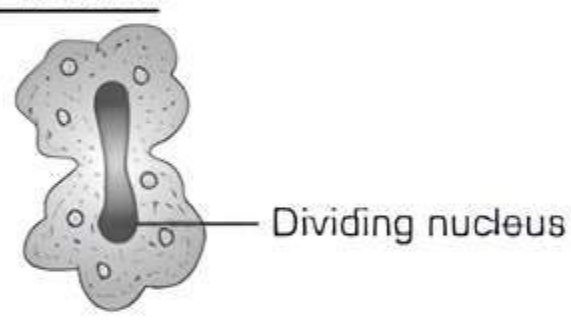
It is so because sexual reproduction generates more variations and thus the offsprings are better adapted to the environment and therefore have better chances of survival.

Q 5. Name the type of asexual reproduction in which two individuals are formed from a single parent and the parental identity is lost. Draw the initial and final stages of this type of reproduction. Write the event with which this process starts and draw its labelled diagram. *(CBSE 2020)*

Ans. Binary fission is the type of asexual reproduction in which two individuals are formed from a single parent and the parental identity is lost.



This type of reproduction starts with elongation of cell and its nucleus.



TiP

Understand the concept of binary fission in Amoeba. Drawing different stages of reproduction and practicing them is mandatory.

Q 6. (i) List in tabular form two differences between binary fission and multiple fission.

(ii) What happens when a mature *Spirogyra* filament attains considerable length? *(CBSE 2020)*

Ans. (I)

Basis of Difference	Binary Fission	Multiple Fission
(a) Concept	The parent organism divides into two identical daughter cells.	The parent organism divides into many daughter cells.
(b) Condition required	It takes place in favourable conditions.	It takes place in favourable as well as unfavourable conditions.
(c) Division pattern	Many different patterns of division are observed.	No definite pattern of division is observed.

(Any two)

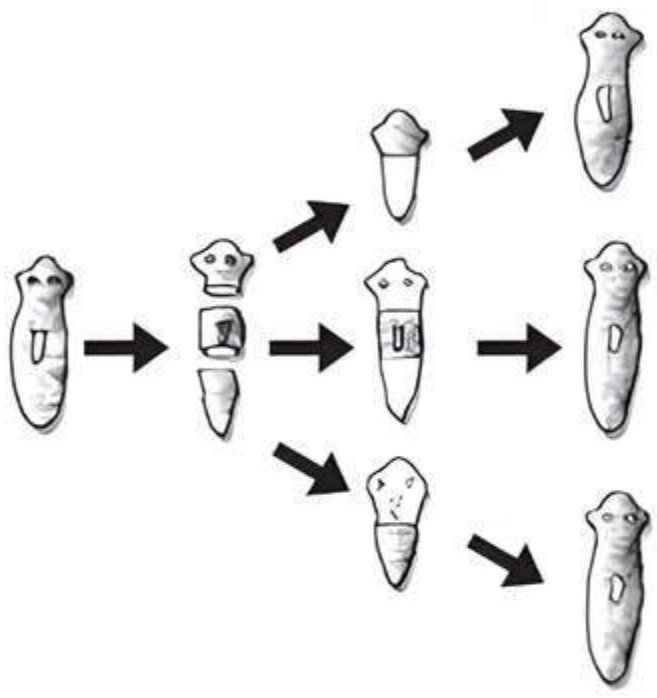
(II) A mature *Spirogyra* breaks into smaller pieces or fragments and each fragment develops into a new organism.

Q 7. (i) Budding, fragmentation and regeneration, all are considered as asexual mode of reproduction. Why?

(ii) With the help of neat diagram, explain the process of regeneration in *Planaria*. *(CBSE 2019)*

Ans. (i) Budding, fragmentation and regeneration are considered as asexual modes of reproduction because all of them only involve only one parent and gametes are not involved in reproduction.

(ii) **Process of regeneration in *Planaria*:**



Q 8. What is regeneration? Give one example of an organism that shows this process and one organism that does not. Why does regeneration not occur in the latter? *(CBSE 2017)*

Ans. Regeneration is a type of asexual reproduction and is the ability of an organism to give rise to new individual organism from its body parts when the individual is cut or broken up into many pieces.

Planaria shows regeneration whereas *Amoeba* does not.

Regeneration does not occur in the latter because specialised cells responsible for regeneration are not present in non-regenerating organisms (*Amoeba*).

Q 9. Name the most suitable method of raising a banana plant. Is this mode of reproduction sexual or asexual? List three advantages of growing plants by such a method. *(CBSE 2020)*

Ans. The most suitable method of raising a banana plant is vegetative propagation.

Vegetative propagation is an asexual mode of reproduction.

Advantages of Vegetative Propagation:

(I) Plants bear flowers and fruits earlier by those propagated sexually.

(II) Plants which have lost the capacity to produce seeds can reproduce by vegetative propagation.

(III) All plants produced are genetically similar to the parent plant.

Q 10. Describe reproduction by spores in *Rhizopus*. *(CBSE 2017)*

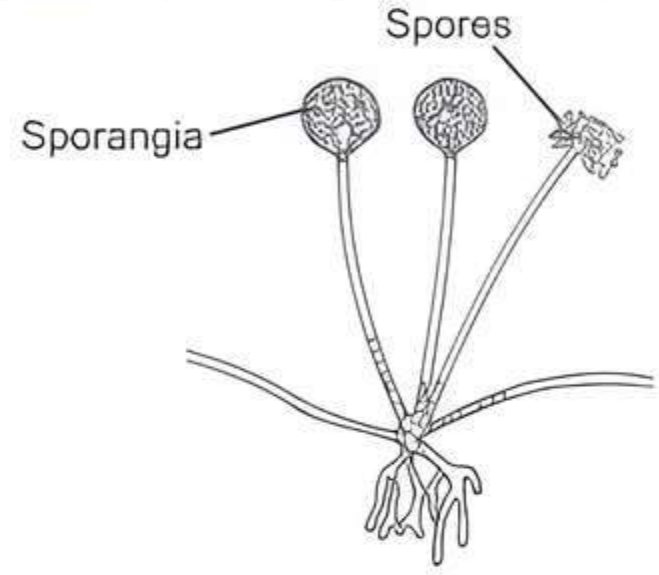
Ans. Reproduction in *Rhizopus:*

(i) *Rhizopus* have sporangia which contains spores as reproductive structures.

(ii) Once sporangia are fully mature, they burst to release spores in the environment.

(iii) During unfavourable conditions, these spores are protected by thick walls.

(iv) On return of the favourable conditions, spores germinate to develop into new *Rhizopus* individuals.



Spore formation in *Rhizopus*

Q 11. Draw a longitudinal section of a flower and label the following parts:

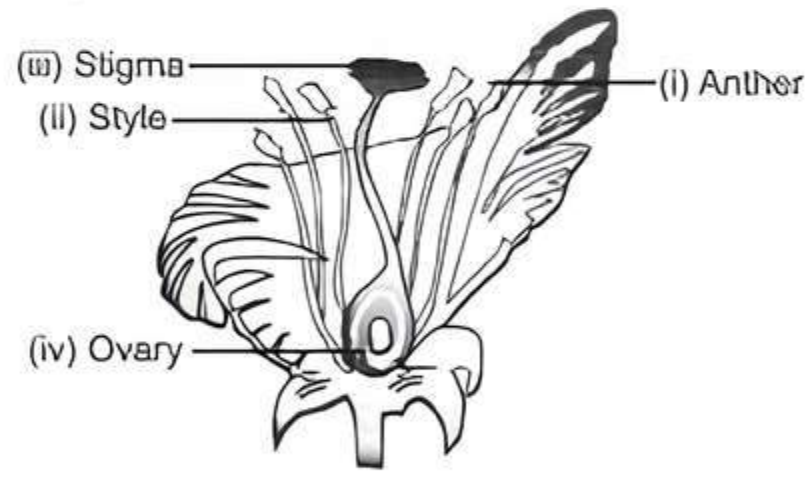
(i) Part that produces pollen grain.

(ii) Part that transfers male gametes to the female gametes.

(iii) Part that is sticky to trap the pollen grain.

(iv) Part that develops into a fruit. *(CBSE 2015)*

Ans. Longitudinal Section of a Flower:



TiP

Practice drawing neat and well-labelled diagram of the longitudinal section of a flower.

COMMON ERROR

Students often commit errors in labelling the diagram.

Q 12. What is carpel? Write the function of its various parts. *(CBSE 2019)*

Ans. Carpel is the female reproductive part of the plant. It is made of three parts:

(i) **Stigma:** It is the sticky surface which collects pollen grains.

(ii) **Style:** It provides pathway to the pollen grains as it connects stigma to the ovary.

(iii) **Ovary:** It is the site of fertilisation in a flowering plant.

Q 13. Define the term pollination. Differentiate between self-pollination and cross-pollination. What is the significance of pollination? *(CBSE 2020)*

Ans. The transfer of pollen grains from the anther of the stamen to the stigma of a flower is termed as pollination.

Basis of Difference	Self-pollination	Cross-pollination
Definition	Self-pollination is the transfer of pollen grains from anther to stigma of the same flower.	Cross-pollination is the transfer of pollen grains from anther to stigma of another flower.

Pollination is a significant process as it leads to fertilisation and zygote formation.

Q 14. Distinguish between pollination and fertilisation. Mention the site and the product of fertilisation in a flower. *(CBSE 2019)*

Ans.

Basis of Distinction	Pollination	Fertilisation
Definition	It is the transfer of pollen from anther to stigma of flowers.	It is the fusion of male and female gametes in sexual reproduction.

The site of fertilisation in a flowering plant is ovary and the product of fertilisation is zygote.

Q 15. List any four steps involved in sexual reproduction and write its two advantages. *(CBSE 2017)*

Ans. Steps involved in sexual reproduction are as follows:

(i) Formation of male and female gametes.
(ii) Transfer of male gamete into female body.
(iii) Fertilisation, *i.e.*, fusion of male and female gametes, resulting in zygote formation.
(iv) Development of zygote into a new individual.

Advantages of sexual reproduction:

(i) It is a source of genetic variation among individuals of a population.
(ii) It is necessary for the continuity of species.

TiP

While learning the sexual mode of reproduction, lay stress on the advantages of sexual reproduction over asexual reproduction.

Q 16. (i) What provides nutrition to human sperms? State the genetic constitution of a sperm.

(ii) Mention the chromosome pair present in zygote which determines the sex of (a) a female child, and (b) a male child. *(CBSE 2020)*

Ans. (i) Nutrition to the sperm is provided by the secretion of seminal vesicles and prostate gland.
Genetic constitution of a sperm: 22 + X and 22 + Y.
(ii) (a) XX (b) XY

Q 17. What is placenta? Describe its two major functions. *(CBSE 2017)*

Ans. Placenta is a disc-like special tissue embedded in the uterine wall that helps the human embryo in obtaining nutrition from mother's blood.

Functions:

(i) It provides large surface area for glucose and O_2 to pass from mother's blood to the embryo.
(ii) It also removes metabolic wastes from the embryo to mother's blood.

Q 18. What are sexually transmitted diseases? Name one sexually transmitted disease each, caused by a virus and a bacterium. List two benefits of using mechanical barriers during the sexual act. *(CBSE 2020)*

Ans. STDs are the diseases which spread by having sexual contact with an infected person.
AIDS and genital warts are the STDs caused by viral infection.
Gonorrhoea and Syphilis are the STDs caused by bacterial infection.

Benefits of using mechanical barriers:

(i) It avoids unwanted pregnancy.
(ii) It also prevents transmission of infections during sexual act.

Long Answer Type Questions

Q 1. (i) What is reproduction? List its two types.
(ii) How are the modes of reproduction different in unicellular and multicellular organisms? *(CBSE 2019)*

Ans. (i) Reproduction is the process of producing new organisms from the existing organisms of the same species.
There are two types of reproduction:
(a) Asexual reproduction.
(b) Sexual reproduction.

COMMON ERROR

Students start explaining the types of reproduction instead of just naming the types of reproduction.

(ii)

Basis of Difference	Unicellular Organisms	Multicellular Organisms
(a) Mode of reproduction	Unicellular organisms reproduce asexually, *i.e.*, only one Parent is required.	Multicellular organisms reproduce by both asexual and sexual (two parents are required) methods.
(b) Requirement	No specialised cells are required for reproduction.	Specialised cells are required for reproduction.

COMMON ERROR

Most students explain this difference incorrectly or do not present it in tabular form.

Q 2. (i) Name and explain the two modes of asexual reproduction observed in hydra.

(ii) What is vegetative propagation? List two advantages of using this technique. *(CBSE 2023)*

Ans.

TiP

Learn and understand the basic concepts of each mode of asexual reproduction and make a list of how each one differs from the other ones with examples.

(i) Two modes of asexual reproduction observed in Hydra are Budding and Regeneration.

Budding in Hydra: In Hydra, a bud develops as an outgrowth due to repeated cell division at one specific site. These buds develop into tiny Hydra individuals and when fully mature, detach from the body of parent Hydra and become new independent Hydra individuals.

Regeneration in Hydra: If the body of Hydra somehow gets cut into a number of pieces, then each body piece of Hydra can grow into a complete Hydra.

(ii) Vegetative propagation in an asexual method of reproduction. In this method, new plants are obtained from the parts of old plants (like stems, roots and leaves) under appropriate conditions.

Advantages of vegetative propagation:

(a) Plants bear flowers and fruits earlier by those propagated sexually.

(b) Plants which have lost the capacity to produce seeds can reproduce by vegetative propagation.

(c) All plants produced are genetically similar to the parent plant. (Any two)

Q 3. Define pollination. Explain the different types of pollination. List two agents of pollination. How does suitable pollination lead to fertilisation? *(CBSE 2019)*

Ans. The transfer of pollen grains from an anther to the stigma of the same or a different flower is known as pollination.

It is of two types, *i.e.*, self-pollination and cross-pollination. When the pollen grains fall on the stigma of the same flower, it is called as self-pollination.

When the pollen grains are transferred to the stigma of a different flower, it is called as cross-pollination.

The pollen grains may be carried by wind, water or animals such as insects, snails, birds, etc.

By the process of pollination, pollen grain reaches to the stigma of flower which leads to the growth of pollen tube from pollen grain. The pollen tube carries the male gametes to ovule present inside the ovary leading to fertilisation. Thus, suitable pollination leads to fertilisation.

Q 4. (i) Draw a diagram showing germination of pollen on stigma of a flower and mark on it the following organs/parts:

(a) Pollen grain (b) Pollen tube

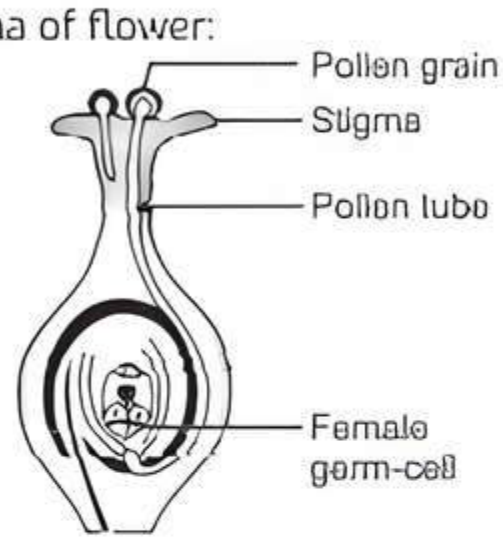
(c) Stigma (d) Female germ-cell

(ii) State the significance of pollen tube.

(iii) Name the parts of flower that develop after fertilisation into:

(a) Seed (b) Fruit *(CBSE 2020)*

Ans. (I) Diagram showing germination of pollen on stigma of flower:



TiP

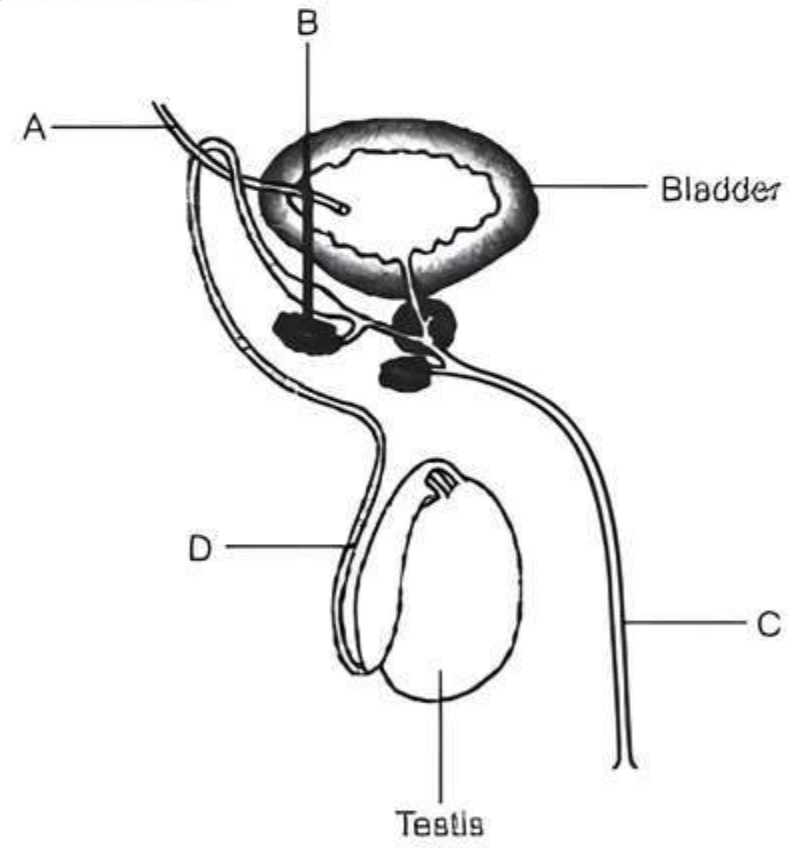
Don't waste time in labelling all the parts of the diagram. Only label the parts asked in the question.

(ii) Pollen tube helps in transportation of the male gamete cells from the pollen grain to the ovules present inside the ovary, leading to fertilisation.

(iii) (a) Ovule develops into seed.

(b) Ovary develops into fruit.

Q 5. Based on the given diagram, answer the questions given below:



(i) Label the parts *A*, *B*, *C* and *D*.

(ii) Name the hormones secreted by testis and mention its role.

(iii) State the functions of *B* and *C* in the process of reproduction. *(CBSE 2020)*

Ans. (i) *A*-Ureter *B*- Seminal vesicle

C-Urethra *D*- Vas deferens

(ii) The hormones secreted by testes is testosterone.

Role of Testosterone:

(a) It regulates the formation of sperms.

(b) It brings change in appearance of boys at the time of puberty.

(iii) Function of B: It provides nutrition and transportation to sperms.

Function of C: It forms a common passage for both the sperms and urine.

Q 6. Given below are certain situations. Analyse and describe its possible impact on a person:

(i) Testes of a male boy are not able to descend into scrotum during his embryonic development.

(ii) Vas deferens of a man is plugged.

(iii) Prostate and seminal vesicles are not functional.

(iv) Egg is not fertilised in a human female.

(v) Placenta does not attach to the uterus optimally.

(CBSE SQP 2023-24)

Ans. (i) Sperm formation will be adversely affected because it requires a lower temperature than the body temperature.

(ii) Vas deferens is a passage for transfer of sperms, so sperms will not be transferred further.

(iii) When prostate and seminal vesicles are not functional, they will not add secretions for nourishment and medium for the transport of sperms.

(iv) When an egg is not fertilised in a human female, it lives for about one day. Then, the thickened lining of the uterus breaks leading to discharge of blood and mucus along with the unfertilised egg. This is called menstruation.

(v) Nutrition and oxygen will not be provided to the growing embryo affecting its growth, which could have serious implications as well.

Q 7. (i) How are variations useful for species if there is drastic alteration in the niches?

(ii) Explain how the uterus and placenta provide necessary conditions for proper growth and development of the embryo after implantation?

(CBSE SQP 2022-23)

Ans. (i) If the niche were drastically altered, the population could be wiped out. However, if some variations were to be present in a few individuals in these populations, there would be some chance for them to survive. Variation is thus useful for the survival of species over time.

(ii) (a) The lining of the uterus thickens and is richly supplied with blood to nourish the growing embryo.

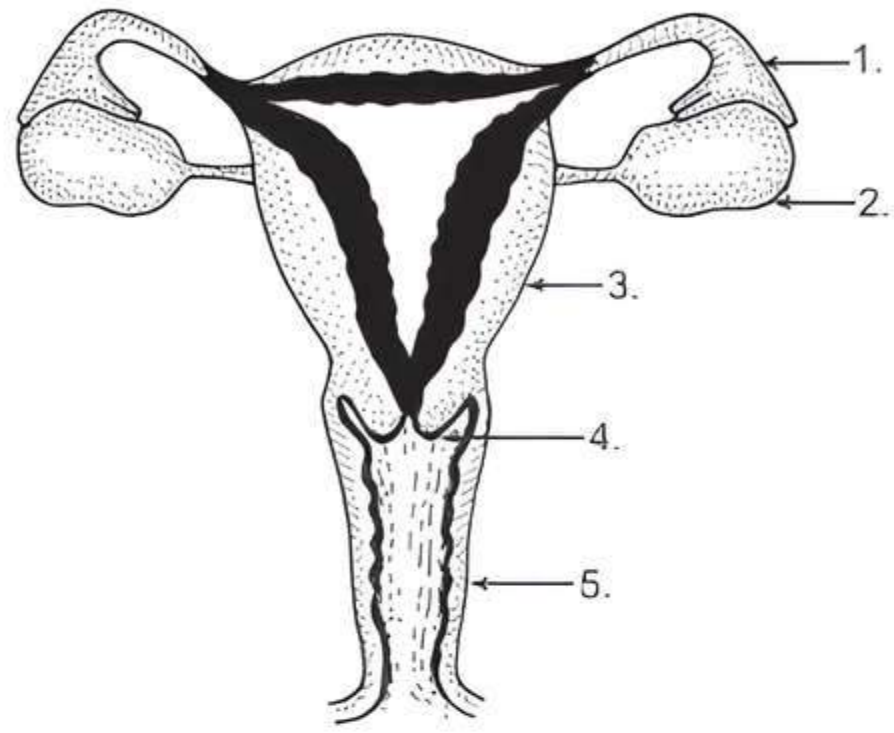
(b) The embryo gets nutrition from the mother's blood with the help of placenta. It is embedded in the uterine wall.

(c) It contains villi on the embryo's side of the tissue. On the mother's side are blood spaces, which surround the villi.

(d) This provides a large surface area for glucose and oxygen to pass from the mother to the embryo. The developing embryo will also generate waste substances which can be removed by transferring them into the mother's blood through the placenta.

(e) The child is born as a result of rhythmic contractions of the muscles in the uterus.

Q 8. (i) Identify the given diagram. Name the parts 1 to 5.



(ii) What is contraception? List three advantages of adopting contraceptive measures. *(CBSE 2019)*

Ans. (i) The given diagram is of human female reproductive system.

The labelled parts are:

1. Oviduct or Falloplan tube
2. Ovary
3. Uterus
4. Cervix
5. Vagina

(ii) The method used to prevent pregnancy as a consequence of sexual intercourse is known as contraception.

Advantages of adopting contraceptives measures are as follows:

(i) It helps in controlling the size of the family which can improve the standard of living.

(ii) It helps in preventing sexually transmitted diseases.

(iii) Frequent and unwanted pregnancies can be avoided by using contraception.

(iv) The general health of the female can be improved as reproduction demands high pressure on the body and mind of the female.

(v) These methods check the population growth of a country by controlling child birth rate.

Q 9. (i) Draw the diagram of female reproductive system and match and mark the following part(s):

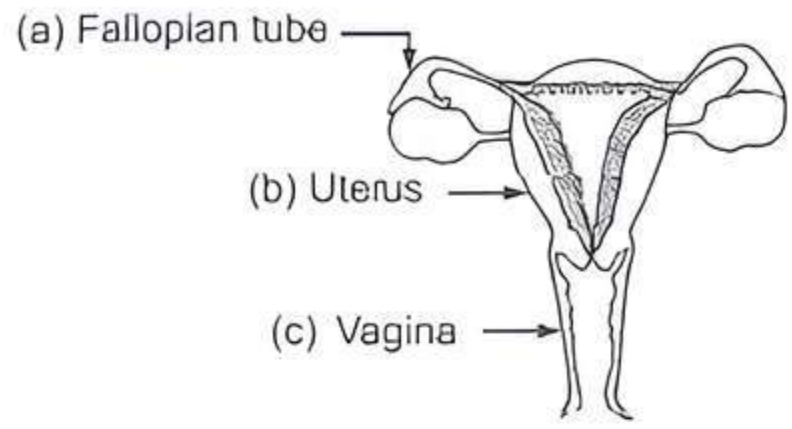
(a) Where block is created surgically to prevent fertilisation?

(b) Where Copper-T is inserted?

(c) Inside which condom can be placed?

(ii) Why do more and more people prefer to use condoms? What is the principle behind use of condoms?

Ans. (i)



(ii) People prefer use of condoms as it prevents STDs by acting as a mechanical barrier.

The principle behind the use of condoms is to avoid the entry of sperm inside the vagina to prevent fertilisation.

Q 10. (i) "Use of a condom is beneficial for both the sexes involved in a sexual act." Justify this statement giving two reasons.

(ii) How do oral contraceptives help in avoiding pregnancies?

(ii) What is sex selective abortion? How does it affect a healthy society? (State any one consequence.)

(CBSE 2020)

Ans. (i) Two reasons are as follows:

(a) It avoids unwanted pregnancies.

(b) It helps in preventing Sexually Transmitted Diseases (STDs).

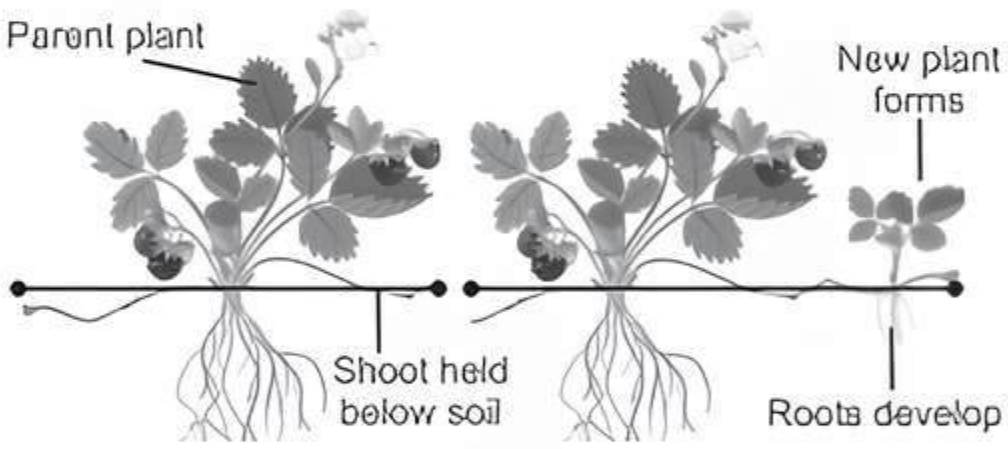
(ii) Oral contraceptives change the hormonal balance of the body so that the eggs are not released.

(iii) Abortion of particular sex especially female foeticides is known as sex selective abortion.
Due to this, female-male sex ratio is declining at an alarming rate in our society.

Chapter Test

Multiple Choice Questions

Q 1. The image shows the process of vegetative propagation in a plant.



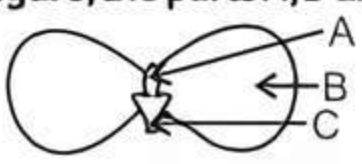
The shoot of the parent plant is pushed below the soil that results in growth of a new plant. What is the advantage of this process?

a. This result in plant of different flowers.
b. This helps grow plants without adding extra manure.
c. This eliminates the need of producing plant using seeds.
d. This allows growth of plants with new genetic composition.

Q 2. Which of the following is the correct sequence of events of sexual reproduction in a flower?

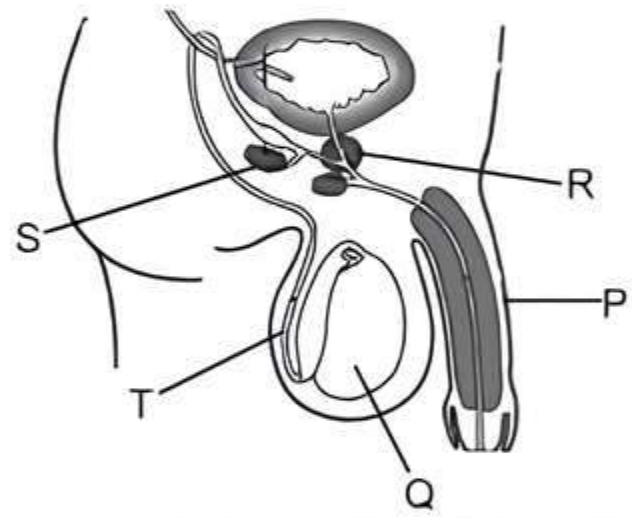
a. Pollination, fertilisation, seedling, embryo
b. Seedling, embryo, fertilisation, pollination
c. Pollination, fertilisation, embryo, seedling
d. Embryo, seedling, pollination, fertilisation

Q 3. In the given figure, the parts *A*, *B* and *C* are sequentially:



a. cotyledon, plumule and radicle
b. plumule, radicle and cotyledon
c. plumule, cotyledon and radicle
d. radicle, cotyledon and plumule

Q 4. Match the labelled parts of the given figure with the correct option.



	P	Q	R	S	T
a.	Urethra	Bladder	Seminal vesicle	Prostate gland	Ureter
b.	Urethra	Testis	Prostate gland	Scrotum	Ureter
c.	Penis	Testis	Prostate gland	Seminal vesicle	Vas deferens
d.	Penis	Bladder	Seminal vesicle	Scrotum	Vas deferens

Assertion and Reason Type Questions

Directions (Q. Nos. 5-6): *Each of the following questions consists of two statements, one is Assertion (A) and the other is Reason (R). Give answer:*

a. Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).
b. Both Assertion (A) and Reason (R) are true but Reason (R) is not a correct explanation of Assertion (A).
c. Assertion (A) is true but Reason (R) is false.
d. Assertion (A) is false but Reason (R) is true.

Q 5. **Assertion (A):** At puberty, human male develops secondary sexual characters.

Reason (R): At puberty there is decreased secretion of testosterone in male.

Q 6. **Assertion (A):** Contraceptive pills can cause side-effects in females.

Reason (R): They prevent pregnancy by blocking the incoming sperms.

Case Study Based Question

Q 7. There are two organisms *X* and *Y* that produce new offspring from single parent only. Organisms *X* when reaches its maximum growth, divides its body into two new organisms. The parent organism does not exist any more and two new daughter organisms grow fully and divide again. Organism *Y* from a small outgrowth on its body called bud which detaches and develops into new organism.

Read the above passage carefully and give the answer of the following questions:

(i) **Select the correct statement.**

a. Organism *X* reproduces asexually whereas organism *Y* reproduces sexually.
b. Organism *X* must be multicellular whereas organism *Y* should be unicellular.
c. Both organisms *X* and *Y* reproduce asexually.
d. Both organisms *X* and *Y* are always multicellular organisms.

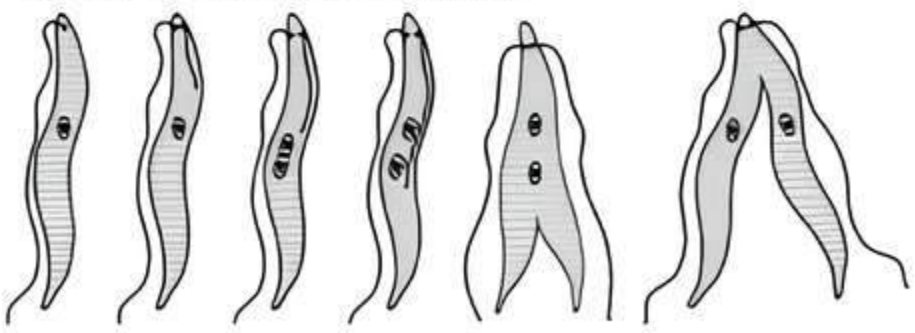
(ii) **Identify the mode of reproduction in organisms *X* and *Y*.**

a. *X* - Multiple fission, *Y* - Binary fission
b. *X* - Binary fission, *Y* - Budding
c. *X* - Regeneration, *Y* - Fragmentation
d. *X* - Fragmentation, *Y* - Multiple fission

(iii) **Which of the following is incorrect?**

a. *Plasmodium* reproduces by the same method as is adopted by organism *X*.
b. Organism *X* could be any multicellular plant.
c. If organism *Y* is *Hydra*, then it may also reproduce through regeneration.
d. Both (a) and (b)

(iv) **Which organism reproduces by the method shown in the given figure?**



a. *Plasmodium*
b. *Amoeba*
c. *Leishmania*
d. *Paramecium*

Very Short Answer Type Questions

Q 8. Why copper-T cannot protect a woman from sexually transmitted diseases?

Q 9. Name the parts of a bisexual flower that are not directly involved in reproduction.

Short Answer Type-I Questions

Q 10. Draw a labelled longitudinal structure of a flower showing its parts.

Q 11. List any two contraceptive methods practised only by women. Mention how these methods work?

Q 12. Draw in sequence (showing the four stages) the process of binary fission in *Amoeba*.

Short Answer Type-II Questions

Q 13. (i) State any two changes seen in boys at the time of puberty.
(ii) Why testis in male body are extra-abdominal?
(iii) Write the dual purpose served by urethra in males?

Q 14. Draw a diagram of the longitudinal section of a flower exhibiting germination of pollen on stigma and label: (i) Ovary, (ii) Male-germ cell, (iii) Female-germ cell and (iv) Ovule on it.

Q 15. Define the following processes of asexual reproduction:
(i) Spore formation
(ii) Regeneration
(iii) Multiple fission

Long Answer Type Questions

Q 16. 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

Q 17. (a) Draw a sectional view of human female reproductive system and label the part where:
(i) Eggs develop.
(ii) Fertilisation take place.
(iii) Fertilised egg gets implanted.
(b) Describe, in brief, the changes the uterus undergoes:
(i) To receive the zygote.
(ii) If zygote is not formed.