How do Organism Reproduce

EXERCIS 1.1

I. Multiple Choice Questions (1 Mark)

Choose the correct answer from the given options.

1. The copying of DNA occur during

(a) cell formation (b) cell division

(c) protein synthesis (d) reproduction

2. The main cause of variations among organisms during sexual reproduction is

(a) Errors in copying DNA (b) Errors in RNA

(c) Errors in both RNA and DNA (d) Genetic drift

3. The reproduction is essential for population of a species

(a) to decrease its number (b) to increase its number

(c) for its survival (d) to become extinct

II. Assertion-Reason Type Questions (1 Mark)

For question numbers 1 and 2 two statements are given-one labeled as **Assertion** (A) and the other labeled **Reason** (R). Select the correct answer to these questions from the codes (a), (b), (c) and (d) as given below:

(a) Both 'A' and 'R' are true and 'R' is correct explanation of the assertion.

(b) Both 'A' and 'R' are true but 'R' is not correct explanation of the assertion.

(c) 'A' is true but 'R' is false.

(d) 'A' is false but 'R' is true.

1. Assertion: DNA is deoxyribonucleic acid.

Reason: DNA transfers genetic characteristics from parents to offsprings.

2. Assertion: There are three types of RNA, t-RNA, m-RNA and r-RNA.

Reason: RNA does not undergo replication.

III. Very Short Answer Type Questions **(1 Mark)**

1. Name the life process of an organism which helps in the growth of its population. [*Delhi* 2015]

2. Where is DNA found in the cell? [*Delhi* 2015]

3. What is DNA? [*Delhi* 2015]

4. Name the information source of making proteins in the cell. State two basic events in reproduction. [*Delhi* 2015] [**HOTS**]

5. What is the effect of DNA copying which is not perfectly accurate in the reproduction process? [*Delhi* 2015] [**HOTS**]

6. The mode of reproduction depends on which feature of the organism?

7. Organisms have a varied body design. Name the property which gives the basic difference in body design.

8. Explain how do organisms create an exact copy of themselves. [*CBSE* 2016]

IV. Short Answer Type Questions-I **(2 Marks)**

1. What is the importance of DNA copying in reproduction?

OR

Why is DNA copying an essential part of the process of reproduction? [*NCERT*] [*Delhi* 2013, 2015]

2. Why is variation beneficial to the species but not necessary for the individual? [*NCERT*]

3. How does reproduction help in providing stability to the populations of species? [*NCERT*]

4. (*a*) What is the location of following: (*i*) DNA in a cell, (*ii*) Gene

(*b*) Expand DNA. [*CBSE* 2016]

5. When a cell reproduces, what happens to its DNA? [*CBSE* 2017]

V. Short Answer Type Question-II **(3 Marks)**

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

VI. Long Answer Type Question **(5 Marks)**

1. (*a*) (*i*) Write full form of DNA.

(*ii*) State the role of DNA in the cell nucleus.

(*iii*) What will be the effect if the information of the DNA is changed?

(*b*) Explain the importance of DNA copying in reproduction. [*CBSE* 2016]

Answers 1.1

I. 1. (*b*) It takes place during cell division.

2. (*a*) Errors in copying DNA.

3. (*b*) It is to increases its number so that it does not became extinct.

II. 1. (*b*) Both 'A' and 'R' are true but 'R' is not correct explanation of the assertion.

2. (*b*) Both 'A' and 'R' are true but 'R' is not correct explanation of the assertion.

III. 1. Reproduction

2. DNA is found in the nucleus.

3. DNA means deoxyribo nucleic acid. It lies in the cell nucleus, which is the source of information for making proteins and different proteins lead to different body designs.

4. DNA in the nucleus of a cell is the source of information for making proteins. The two basic events in reproduction are:

(*i*) creation of copy of DNA

(*ii*) creation of an additional cellular apparatus by cell then the DNA copies separate, each with its own cellular apparatus.

5. DNA copying will lead to variation in populations which helps in evolution of the species.

6. The mode of reproduction depends upon the body design of organism. Those with simple body design may reproduce asexually. Those with complex body design may form gametes and may undergo sexual reproduction.

7. Errors in DNA copying.

8. The cell uses biochemical reactions to make exact copies of DNA or genetic material.

IV. 1. Reproduction involves producing same kind of species from parents. The genetic information is passed to the offspring by DNA present in each cell. This DNA, which is replicated (copied) is responsible for the resemblance of parents with offsprings with same traits. New traits are passed on due to difference in copying, new variations may occur and new species may evolve.

2. If environmental conditions undergo drastic change, some member of a species having variations of tolerating changed temperature may be able to survive, e.g. suppose population of bacteria is living in temperate water. If temperature of water increases due to global warming, most of the bacteria will die. However, if few variants are resistant to heat, then they would survive and grow further. Thus variation is useful for the survival of species over time, but it is not necessary for the individual.

3. It is because reproduction is a process by which species increase their population. If the rate of birth is more than death, the size of population will increase and will be more stable.

4. (*a*) (*i*) DNA is found in nucleus of cell, (*ii*) Genes are located on the chromosomes.

(*b*) Deoxyribonucleic acid.

5. During the process of reproduction, transmission of DNA from parents to offspring takes place. Before reproduction, DNA is replicated, which means two copies of DNA are produced. When the cell divides into two, these two copies are distributed equally between the two daughter cells so that similar amount and type of DNA is transferred from the parent cell to the daughter cells. It maintains the consistency in the amount and type of DNA in the living organism of a particular species.

V. 1. Reproduction is an energy consuming process which is not essential for the survival of an individual. But it is the most important characteristic of all living beings, because of the following reasons:

(*i*) Reproduction helps in increasing the number of members of a population.

(*ii*) By replacing the dead members with the new ones, it minimises the risk of extinction of a species.

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

VI. 1. (*b*) (*i*) Deoxy Ribonucleic Acid

(*ii*) It helps in synthesis of protein and transfer of genetic characteristics.

(*iii*) Proteins will be changed.

(*b*) Body designs are similar due to DNA copying.

DNA cell nucleus carry information for synthesis of protein.

If DNA copying will not take place then body design will change.

EXERSISE 1.2

I. Multiple Choice Questions (1 Mark)

Choose the correct answer from the given options.

1. In the list of organisms given below, those that reproduce by the asexual method are

(*i*) banana (*ii*) dog (*iii*) yeast (*iv*) amoeba

(*a*) (*ii*) and (*iv*) (*b*) (*i*), (*iii*) and (*iv*) (*c*) (*i*) and (*iv*) (*d*) (*ii*), (*iii*) and (*iv*)

2. In a flower, the parts that produce male and female gametes (germ cells) are
(*a*) stamen and anther (*b*) filament and stigma
(*c*) anther and ovary (*d*) stamen and style

3. 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

4. Offspring formed by asexual method of reproduction have greater similarity among themselves because
(*i*) asexual reproduction involves only one parent
(*ii*) asexual reproduction does not involve gametes
(*iii*) asexual reproduction occurs before sexual reproduction
(*iv*) asexual reproduction occurs after sexual reproduction
(*a*) (*i*) and (*ii*) (*b*) (*i*) and (*iii*) (*c*) (*ii*) and (*iv*) (*d*) (*iii*) and (*iv*)

II. Assertion-Reason Type Questions (1 Mark)

For question numbers 1 and 2 two statements are given-one labeled as **Assertion** (A) and the other labeled **Reason** (R). Select the correct answer to these questions from the codes (*a*), (*b*), (*c*) and (*d*) as given below:
(*a*) Both 'A' and 'R' are true and 'R' is correct explanation of the assertion.
(*b*) Both 'A' and 'R' are true but 'R' is not correct explanation of the assertion.
(*c*) 'A' is true but 'R' is false.
(*d*) 'A' is false but 'R' is true.

1. Assertion: Cell division is a type of reproduction in unicellular organisms.
Reason: It leads to formation of two daughter cells where means is to produce more individuals.

2. Assertion: Spores are formed in sporangia.
Reason: Spores grow into separate individuals in moist conditions.

III. Very Short Answer Type Questions (1 Mark)

1. How does binary fission differ from multiple fission? [*NCERT*]

2. Name the part of *Bryophyllum* where the buds are produced for vegetative propagation. [*Delhi* 2016]

3. What happens when a *Planaria* gets cut into two pieces? [*Delhi* 2016]

4. What happens when a mature *Spirogyra* filament attains considerable length? [*Delhi* 2016]

5. Name the method by which hydra reproduces. Is this method sexual or asexual? [*Delhi* 2016]

6. Name two simple organisms which have ability of regeneration. [*Delhi* 2015]

7. Name the causative agent of the disease '*kala-azar*' and its mode of asexual reproduction. [*Delhi* 2015]

8. Select two plants from the following which are grown by vegetative propagation process:
Banana, *Wheat*, *Mustard*, *Jasmine*, *Gram*.

9. Give the respective scientific term used for studying.
(*i*) The mechanism by which variation are created and inherited and
(*ii*) The development of new type of organism from the existing ones. [*CBSE* 2015]

10. Name the type of cells which undergo regeneration. [*CBSE* 2015]

11. Regeneration is not possible in all types of animals. Why? [*CBSE* 2012]

12. What is the advantage of reproduction through spores? [*CBSE* 2012]

OR

How will organism be benefitted if it reproduces through spores? [*NCERT*]

13. Name the method by which spirogyra reproduces under favourable conditions. Is this method sexual or asexual? [*CBSE* 2017]

14. How does *Planaria* reproduce? Is this method sexual or asexual? [*CBSE* 2017]

15. How does *Plasmodium* reproduce? Is this method sexual or asexual? [*CBSE* 2017]

IV. Short Answer Type Questions-I (2 Marks)

1. "Cell division is a type of reproduction in unicellular organism". Justify. [*NCERT Exemplar*]

2. What is a clone? Why do offsprings formed by asexual reproduction exhibit remarkable similarity? [*NCERT Exemplar*] [**HOTS**]

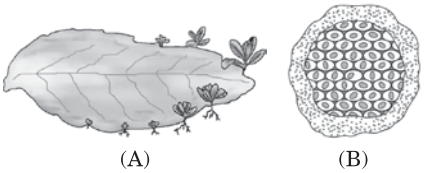
3. Can you think of reasons why more complex organisms cannot give rise to new individuals through regeneration? [*NCERT*]
4. Why is vegetative propagation practised for growing some types of plants? [*NCERT*]
5. List two advantages of growing grapes or banana plants through vegetative propagation.[*Delhi* 2013]
6. List three conditions favourable for spores to germinate and grow. [*Delhi* 2013]
7. Name the type of asexual reproduction in
   (*a*) Planaria (*b*) Rhizopus
   (*c*) Spirogyra (*d*) Hydra [*CBSE* 2011]
8. Leaves of bryophyllum fallen on the ground produces new plants, why? [*CBSE* 2011]
9. 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. [*Delhi* 2017]
10. Draw in sequence (showing the four stages), the process of binary fission in Amoeba. [*AI* 2017]

V. Short Answer Type Questions-II (3 Marks)

1. What is multiple fission? How does it occur in an organism? Explain briefly. Name an organism which exhibits this type of reproduction. [*Delhi* 2016]
2. Explain the term 'Regeneration' as used in relation to reproduction of organisms. Describe briefly how regeneration is carried out in multicellular organisms like Hydra. [*Delhi* 2016]
3. In the context of reproduction of species state the main difference between fission and fragmentation. Also give one example of each. [*Delhi* 2016]
4. What happens when
   (*i*) Planaria gets cut into two pieces
   (*ii*) A mature spirogyra filament attains considerable length
   (*iii*) On maturation sporangia burst [*Delhi* 2016]
5. Explain budding in hydra with the help of labelled diagrams only. [*Delhi* 2015]
6. What happens when:
   (*a*) Accidently, Planaria gets cut into many pieces?
   (*b*) Bryophyllum leaf falls on the wet soil?
   (*c*) On maturation sporangia of Rhizopus bursts? [*Delhi* 2017]
7. What is vegetative propagation? State two advantages and two disadvantages of this method. [*CBSE* 2017]
8. Define the term pollination. Differentiate between self pollination and cross pollination. What is the significance of pollination? [*CBSE* 2020]
9. (*a*) List in tabular form two differences between binary fission and multiple fission.
   (*b*) What happens when a mature spirogyra filament attains considerable length. [*CBSE* 2020]

VI. Long Answer Type Questions (5 Marks)

1. What is binary fission in organisms? With the help of suitable diagrams, describe the mode of reproduction in amoeba. [*Delhi* 2011]
2. Identify the following methods and give one example of each:
   (*a*) Process in which reproduction takes place by breaking up of parent into several fragments.
   (*b*) Process of dividing of organisms into many cells simultaneously.
   (*c*) Process of reproduction by formation of bud on the parent body.
   (*d*) Process of reproduction by formation of spores.
   (*e*) Process used by multi-cellular organisms to reproduce by cutting into many pieces and each piece forms a new individual. [*CBSE* 2016]
3. (*a*) Identify the organism A, B and mode of asexual reproduction exhibited by them.
   (*b*) How will an organism be benefitted if it reproduces through spores?
   (*c*) Mention the two asexual methods by which hydra can reproduce. Explain briefly any one such method. [*CBSE* 2013]


(A) (B)

4. What is vegetative propagation? Give examples of plants which can be propagated by their:
   (*a*) Stem (*b*) Roots (*c*) Leaves

5. (*i*) Describe the various steps involved in the process of binary fission with the help of a diagram.
(*ii*) Why do multicellular organisms use complex way of reproduction? [*CBSE Sample Paper* 2019-2020]

Answers 1.2

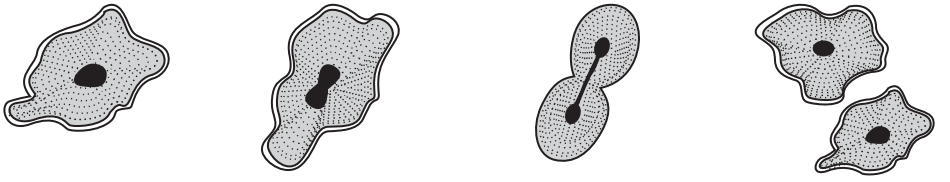
I. 1. (*b*) Banana, Yeast and Amoeba reproduce by asexual reproduction.
2. (*c*) anther and ovary
3. (*c*) pollination, fertilisation, embryo, seedling
4. (*a*) (*i*) and (*ii*) statement are correct.
II. 1. (*a*) Both 'A' and 'R' are true but 'R' is not correct explanation of the assertion.
2. (*a*) Both 'A' and 'R' are true but 'R' is not correct explanation of the assertion.
III. 1. In binary fission cell divides into two cells whereas in multiple fission a cell divide into many daughter cells.
2. Buds arise from the notches in the leaf margins of *Bryophyllum*.
3. Each piece regenerates into new organism, planaria.
4. A mature spirogyra filament breaks into smaller fragments and each fragment grows into a new plant. This process of reproduction is called fragmentation.
5. Hydra reproduces by budding. It is an asexual mode of reproduction.
6. Planaria and Hydra
7. Leishmania causes '*kala-azar*'. It reproduces by binary fission in a definite orientation.
8. Banana and jasmine are grown by vegetative propagation, because they do not produce seeds.
9. (*i*) Heredity, (*ii*) Evolution.
10. Specialised cells called regenerative cells which can make large number of new cells.
11. Regeneration is carried out by specialised cells which are present in few animals which can reproduce by regeneration.
12. Spore with a cell wall can survive even in adverse conditions. Large number of spores are produced in one sporangium. It is easily dispersed through wind as they are large in number and light in weight.
13. Under favourable conditions, spirogyra reproduces by a process known as fragmentation. This is an asexual method of reproduction.
14. *Planaria* reproduces by a process known as regeneration. It is a type of asexual reproduction in which if *Planaria* can be cut into any number of pieces, each piece grows into a new individual organism.
15. *Plasmodium* is a single celled organism which reproduces by the process of multiple fission. Multiple fission (i.e. breaking up of a single cell into many daughter cells) is an asexual mode of reproduction.
IV. 1. Cell division in a unicellular organism results in the formation of two or more daughter cells which means it produces more individual.
2. Clones are organisms which are exact genetics copies of their parents. Their DNA is exactly identical to their parents, which is the cause of remarkable similarity.
3. Those organisms which reproduce by regeneration have similar and non-differentiated cells throughout the body, therefore body parts of organism grows into new organism.
In multicellular complex organisms, the cells get differentiated and perform different functions. In such organisms, body parts like skin, muscles, i.e. tissues can be regenerated, but the whole organism cannot be reproduced by regeneration.
4. (*i*) Vegetative propagation is used to grow plants in which seeds are not formed or very few seeds are formed, e.g. banana, pineapple, orange.
(*ii*) It helps to grow plants in conditions where seed germination fails due to change in environment.
(*iii*) It is a faster, easier and cheaper process.
(*iv*) The plants produced are genetically similar and good quality or variety can be preserved easily.
5. (*i*) Characteristics of parent plants are preserved.
(*ii*) Since these plants do not have viable seeds, therefore vegetative propagation is advantageous.
6. (*i*) Availability of nutrition (food), (*ii*) moist place, (*iii*) warmth, (*iv*) dark place. (*Any three*)

7. (*a*) Regeneration (*b*) Spore formation
(*c*) Fragmentation (*d*) Budding

8. Leaves of bryophyllum has adventitious buds or plantlets in the notches along the leaf margin. When buds fall on the soil, they develop into new plant under favourable conditions.

9. Binary fission, e.g. Fission in Amoeba

Elongation of cell and its nucleus is the first step.



I II III IV

10. Sequence (showing the four stages), the process of binary fission in Amoeba.
(*Refer to ans. 9 for diagram*)

V. 1. The process in which parent cell divides into several small and equal sized daughter cells, which grows into a new organism is called multiple fission.

The nucleus of a cell divides into large number of nuclei and cytoplasm separates, forming a membrane around it. All this occurs within a protective covering. Plasmodium exhibits multiple fission.

2. Regeneration is the ability to produce an organism from their body parts. Many fully differentiated organisms show ability to reproduce by regeneration. In hydra, if the body is cut into two or three pieces, the lower part will develop head while the upper part will develop rest of the body. If its cells are separated, hydra will reform its structure by regeneration.

3.

Fission	Fragmentation
It takes place in unicellular organisms.	It takes place in multicellular organisms.
The cell splits into two or more cells, giving rise to daughter cells, e.g. amoeba, paramecium.	The body of the organism simply breaks into smaller pieces, which upon maturation grow into new individual, e.g. spirogyra.

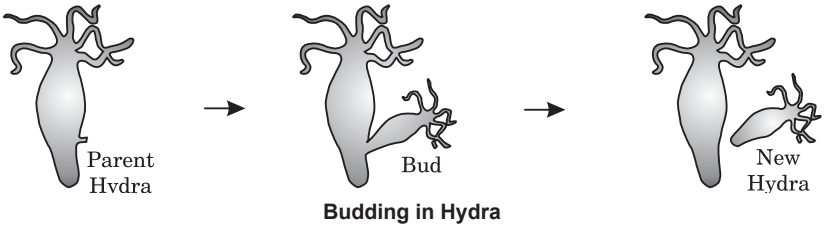
4. (*i*) Each piece will regenerate into complete organism. Cells at the location of the site of cut or wound, forms a small ball of cells that will differentiate into new tissues and regenerate the missing parts of the cut piece of the planaria.

(*ii*) When spirogyra attains considerable length, it breaks into smaller fragments and each fragment grows into a new plant.

(*iii*) On maturation, sporangial wall breaks and spores are dispersed to grow into new individual. These spores are very light and easily dispersed by wind.

5. A bud is an outgrowth from the body part of parent due to repeated cell division at a specific site. These buds develop into new individuals, which detach from the parent body on maturation.

In hydra, the cells divide very fast at a specific site as an outgrowth called bud. These bud develops into a small individual, while remaining attached to the parent. When it matures, it detaches from the parent body to exist as an independent organism.



Budding in Hydra

6. (*a*) When Planaria gets cut into many pieces, it will undergo a process known as regeneration due to which each piece will grow into a new planaria organism.

(*b*) When bryophyllum leaf falls on the wet soil, the buds that are produced in the notches along the leaf will develop into new plants by the process known as vegetative propagation.

(*c*) When the sporangia of Rhizopus bursts upon maturation, the spores present inside it spread in the open environment. Then, with the help of different agents, they are carried to different places and when they land on a favourable surface, they start growing and produce new organism.

7. Vegetative propagation is a mode of asexual reproduction in which new plants are obtained from vegetative parts of the plants. It does not involve the production of seeds or spores for the propagation of new plants.

Two advantages of vegetative propagation are:

(*i*) Plants which do not produce seeds are propagated by this method, for example sugarcane, potato, etc.

(*ii*) Vegetative propagation is a cheaper, easier, rapid method of propagation in plants than growing plants from their seeds. For example, lilies grow very slowly and take 4 to 7 years to develop flowers when grown through their seeds, but flowers are produced only after a year or two when grown vegetatively.

Two disadvantages of vegetative propagation are:

(*i*) As there is no genetic variation, there is no chance of development of new and better varieties.

(*ii*) The vegetatively propagated plants are more prone to diseases that are specific to the species. This can result in the destruction of an entire crop.

8. Pollination: The process in which pollen is transferred from stamen to the stigma is called pollination.

Self pollination	Cross pollination
If the transfer of pollen occurs in the same flower, it is called self pollination.	If the transfer of pollen occurs from one flower to another, it is called cross pollination.

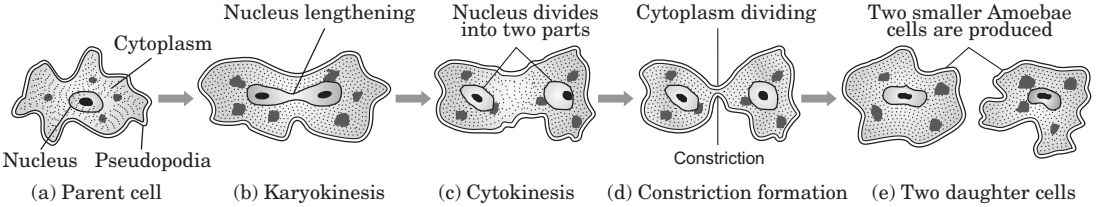
Significance: After the pollen lands on suitable stigma, it needs to reach the female germ cells in the ovary where fertilisation takes place, zygot is formed. Zygot divides several times to form embryo with in ovule which develops a tough coat around it called seed coat and seed is formed. The ovary grows rapidly and ripens to form fruit.

9. (*a*)

Binary fission	Multiple fission
Nucleus divides into two parts.	Nucleus divides into more than two parts.
It occurs in normal conditions.	It occurs in abnormal conditions.
It give rise to two new individuals.	It give rise to many new individuals.
Cytoplasm divides after each division e.g. in Amoeba	Cytoplasm does not divide after every nuclear division e.g. in plasmodium.

(*b*) A mature spirogyra filament breaks into smaller fragments and each fragment grows into a new plant. This process of reproduction is called fragmentation.

VI. 1. Binary fission is a fission in which two daughter cells are formed of nearly equal size after replicating the genetic material of a single cell. Single-celled organisms like amoeba undergoes binary fission.



Binary fission in Amoeba

2. (*a*) Fragmentation, Spirogyra (*b*) Multiple fission, Plasmodium
(*c*) Budding, Yeast/Hydra (*d*) Spore formation, Rhizopus
(*e*) Regeneration, Planaria

3. (*a*) 'A' is Bryophyllum–Vegetative propagation; 'B' is Plasmodium–Multiple fission

(*b*) Spores are covered with thick walls which protect them until they come into contact with a moist surface.

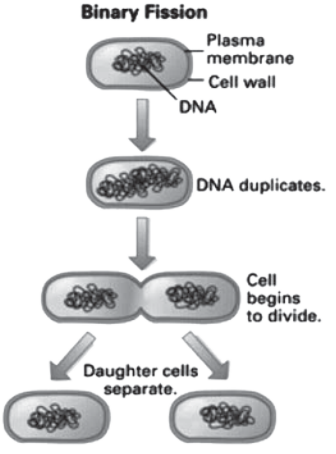
(*c*) Budding and regeneration

Budding: In this process hydra (or any other organism like yeast) use regenerative cells for reproduction. A bud develops as an outgrowth due to repeated cell division which develop into new individuals.

(*a*) Stem—Potato, Onion, Ginger (*b*) Roots—Banana, Asparagus

(*c*) Leaves—Bryophyllum

5. (*i*)



(*ii*) Multicellular organisms cannot reproduce by cell because they are not simple random collection of cells.

They have specialised cells, organised as tissues which are organised into organs.

Cell-by-cell division would be impractical (not practical).

Multicellular organisms require to use more complex ways of reproduction.

EXERSISE 1.3

I. Multiple Choice Questions (1 Mark)

Choose the correct answer from the given options.

1. During adolescence, several changes occur in the human body. Mark one change associated with sexual maturation in boys.
(*a*) loss of milk teeth (*b*) increase in height
(*c*) cracking of voice (*d*) weight gain

2. In human females, an event that reflects onset of reproductive phase is
(*a*) growth of body (*b*) changes in hair pattern
(*c*) change in voice (*d*) menstruation

3. In human males, the testes lie in the scrotum, because it helps in the
(*a*) process of mating (*b*) formation of sperm
(*c*) easy transfer of gametes (*d*) all the above

4. Which among the following is not the function of testes at puberty?
(*i*) formation of germ cells (*ii*) secretion of testosterone
(*iii*) development of placenta (*iv*) secretion of estrogen
(*a*) (*i*) and (*ii*) (*b*) (*ii*) and (*iii*)
(*c*) (*iii*) and (*iv*) (*d*) (*i*) and (*iv*)

5. Fertilisation is the process of
(*a*) transfer of male gamete to female gamete.
(*b*) fusion of nuclei of male and female gamete.
(*c*) adhesion of male and female reproductive organs.
(*d*) the formation of gametes by a reproductive organ. [*CBSE* 2020]

II. Assertion-Reason Type Questions (1 Mark)

For question numbers 1 and 2 two statements are given-one labeled as **Assertion** (A) and the other labeled **Reason** (R). Select the correct answer to these questions from the codes (*a*), (*b*), (*c*) and (*d*) as given below:
(*a*) Both 'A' and 'R' are true and 'R' is correct explanation of the assertion.
(*b*) Both 'A' and 'R' are true but 'R' is not correct explanation of the assertion.
(*c*) 'A' is true but 'R' is false.
(*d*) 'A' is false but 'R' is true.

1. **Assertion:** Pollination is different from fertilisation.
Reason: The process of transfer of pollens from anther to stigma is called pollination which takes place in plants.

2. **Assertion:** Pistil is male reproductive part of flower.
Reason: Pollen grain land on stigma and germinate.

III. Very Short Answer Type Questions (1 Mark)

1. If a women is using copper-T, will it help in protecting against sexually transmitted diseases? [*NCERT*]

2. What are those organisms called which bear both the sex organs in the same individual? Give one example of such organisms. [*Delhi* 2016]

3. List two functions of ovary of human female reproductive system. [*NCERT*]

4. Why is fertilisation not possible without pollination in plants? [*Delhi* 2016]

5. List two unisexual flowers. [*Delhi* 2016]

6. List two reasons for the appearance of variations among the progeny formed by sexual reproduction. [*Delhi* 2016]

7. List two functions performed by testis in human beings. [*Delhi* 2015]

8. Name the parts of a bisexual flower that are not directly involved in reproduction. [*Delhi* 2015]

9. What is the role of scrotum? [**HOTS**]

10. How can the chromosomes be identified? [*CBSE* 2014]

11. Why is temperature of scrotal sac 2°C less than the body temperature? [*CBSE* 2012, 2014]

12. Differentiate between pollen grain and ovule. [*CBSE* 2011]

13. Differentiate between germination and fertilisation. [*CBSE* 2011]

14. What are sexually transmitted diseases? Name a STDs which damages the immune system of human body. [*CBSE* 2015]

15. What happens when egg is not fertilised? [*CBSE* 2012]

16. Why does the lining of uterus becomes thick and spongy during every month? [*CBSE* 2013]

17. Give one difference between zygote and embryo.

18. Write the expanded form of AIDS.

19. Give an example of a flower which contains both stamens and carpels. [*CBSE Sample Paper* 2017-18]

IV. Short Answer Type Questions-I (2 Marks)

1. How is the process of pollination different from fertilisation? [*NCERT*]

2. What is the role of seminal vesicles and prostate gland? [*NCERT*]

OR

Write the functions of secretions of prostate gland and seminal vesicles in humans. [*CBSE* 2016]

3. List two preparations shown every month by the uterus in anticipation of pregnancy in the humans. [*Delhi* 2015]

4. Write the number of immature eggs present in the ovaries of newly born baby girl. Mention what happens to these immature eggs when the girl attains maturity. [*Delhi* 2013]

5. Trace the path of sperms from where they are produced in human body to the exterior. [*Delhi* 2015]

6. What is the main difference between sperms and eggs of humans? Write the importance of this difference. [*CBSE* 2014]

7. The chromosomal number of the sexually producing parents and their offspring is the same. Justify this statement.

8. Differentiate between plumule and radicle. [*CBSE* 2011]

9. Why do we need to adopt contraceptive measures? [*CBSE* 2019] [*CBSE* 2012, 2013]

10. Give two differences between male gametes and female gametes. [*CBSE* 2012]

11. State one function each performed by following organs in human beings.
(*a*) Testes (*b*) Prostate gland. [*CBSE* 2013]

12. Differentiate between the following:
(*i*) Role of placenta and uterus in pregnancy (*ii*) Unisexual and bisexual flowers

V. Short Answer Type Questions-II (3 Marks)

1. What are the two roles of testosterone? [*CBSE* 2015]

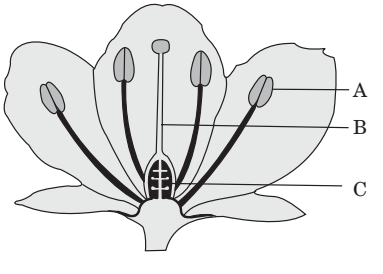
2. What are changes seen in girls at the time of puberty? [*NCERT*]

3. List three techniques that have been developed to prevent pregnancy. Which one of these is not meant for males? How does the use of these techniques have a direct impact on health and prosperity of a family? [*AI* 2017]

4. Foetus derives its nutrition from the mother.
(*i*) Identify the tissue used for above purpose. Explain its structure.
(*ii*) Explain how wastes generated by developing embryo are removed.
(*iii*) How does the birth of child take place?

5. Draw the diagram of a female reproductive system and label the part which:
(*i*) Produces egg in female germ cell (*ii*) Part where zygote is implanted.
(*iii*) Path for entry of sperms.

6. Name the parts A, B and C shown in the following diagram and state one function of each. [*Delhi* 2016]

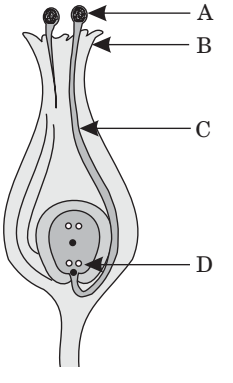


7. Name the reproductive parts of an angiosperm. Where are these parts located? Explain in brief the structure of female reproductive parts. [*Delhi* 2016]

8. Suggest three contraceptive methods for birth control, which is essential for the health and prosperity of a country. State the basic principle involved in each. [*Delhi* 2016]
9. List three distinguishing features between sexual and asexual types of reproduction in tabular form. [*Delhi* 2015]
10. Describe the structure and function of placenta. [*Delhi* 2014][*AI* 2017]
11. Differentiate between self pollination and cross pollination. [*CBSE* 2011]
12. Why are testes located outside the abdominal cavity? Mention the endocrine and exocrine functions of the testes. [*CBSE* 2016]
13. List six specific characteristics of sexual reproduction. [*CBSE* 2016]
14. (*a*) State in brief the functions of following female reproductive system
(*i*) Ovary, (*ii*) Fallopian tube, (*iii*) Uterus [*CBSE* 2017]
(*b*) State in brief the functions of following male reproductive system
(*i*) Scrotum, (*ii*) Testes, (*iii*) Vas deferens [*CBSE* 2011]
15. Why must pollination occur before fertilisation? How is pollination different from fertilisation? What does a pollen contain inside?
16. Mention the changes observed in flower after fertilisation.
17. How do sperms reach the female genital tract? Where fertilisation and implantation of the embryo does take place? For how long does the embryo remain attached to uterine walls?
18. Draw a labelled diagram of longitudinal section of pistil of flower showing germination of pollen grains on the stigma. [*CBSE* 2004]
19. State the basic requirements for sexual reproduction. Write the importance of such reproduction in nature. [*Delhi* 2017]
20. State the changes that take place in the uterus when:
(*a*) Implantation of embryo has occurred.
(*b*) Female gamete/egg is not fertilised. [*Delhi* 2017]
21. List any four steps involved in sexual reproduction and write its two advantages. [*CBSE* 2017]
22. 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.

VI. Long Answer Type Questions (5 Marks)

1. (*i*) Identify A, B, C and D in the given figure. Write their names.
(*ii*) What is pollination? Explain its significance.
(*iii*) Explain the processes of fertilisation in flowers. Name the parts of the flower that develop after fertilisation into (*a*) seed (*b*) fruit. [*Delhi* 2015]



4. (*i*) Draw a sectional view of human female reproductive system and label the part where (*a*) Egg develops, (*b*) fertilisation takes place, (*c*) fertilised egg gets implanted. [*Delhi* 2013]
(*ii*) Describe in brief the changes that uterus undergoes (*a*) to receive the zygote (*b*) if zygote is not formed. [*Delhi* 2014]
3. List four points of significance of reproductive health in society. Name any two areas related to reproductive health which have improved over the past 50 years. [*CBSE* 2016]
4. Explain what happens when:
(*a*) Testosterone is released in males. (*b*) Pollen grains falls on the stigma of flowers.
(*c*) Egg fuses with sperm cell. (*d*) Planaria is cut into many pieces.
(*e*) Buds are formed on notches of the bryophyllum leaf. [*CBSE* 2014, 2015]
5. Write two causes of human population explosion. Explain with the help of a suitable examples how this explosion can be checked. [*CBSE* 2013]
6. (*a*) Name the organ that produces sperms as well as secretes a hormone in human males. Name the hormone it secretes and write its functions.
(*b*) Name the parts of the human female reproductive system where fertilisation occurs.
(*c*) Explain how the developing embryo gets nourishment inside the mother's body. [*Delhi* 2017]

7. (*a*) Draw the diagram of female reproductive system and match and mark the part (s):
(*i*) Where block is created surgically to prevent fertilisation.
(*ii*) Where CuT is inserted. (*iii*) Inside which condom can be placed.
(*b*) Why do more and more people prefer to use condoms? What is the principle behind use of condoms? [*CBSE Sample Paper* 2018-19]

8. (*i*) Describe the role of prostate gland, seminal vesicle and testes in the human male reproductive system.
(*ii*) How is the surgical removal of unwanted pregnancies misused?
(*iii*) Explain the role of oral contraceptive pills in preventing conception.

9. (*a*) List three different categories of contraception methods. [*CBSE Sample Paper* 2019]
(*b*) Why has Government of India prohibited prenatal sex determination by law? State its benefits in the long run.
(*c*) Unsafe sexual act can lead to various infections. Name two bacterial and two viral infections caused due to unsafe sex. [*CBSE* 2020]

10. Trace the changes that take place in a flower from gamete formation to fruit formation.

Answers 1.3

I. 1. (*c*) cracking of voice **2.** (*d*) menstruation

3. (*b*) formation of sperm **4.** (*c*) (*iii*) and (*iv*)

5. (*b*) fusion of nuclei of male and female gamete.

II. 1. (*b*) Both 'A' and 'R' are true but 'R' is not correct explanation of the assertion.

2. (*d*) 'A' is false but 'R' is true.

III. 1. No, it can only prevent unwanted pregnancy. It will not be able to prevent contact of body fluids.

2. These are called hermaphrodites, e.g. earthworm and leech.

3. (*i*) Ovary produces eggs for fertilisation.
(*ii*) They also produces hormones oestrogen and progestrone.

4. Fertilisation is the process in which pollen grain and egg fuse to form zygote. Pollination is the process of transfer of pollen grains from stamen to the stigma of carpel. It means that fertilisation is not possible without pollination.

5. Watermelon, Cucumber and Willows (*Any two*)

6. (*i*) Special cell division involved in the process of gametes formation is the cause of variations.
(*ii*) Genetic material comes from two parents, which brings variations in offsprings.

7. (*i*) Testis produces sperms.
(*ii*) It produces testosterone hormone.

8. Sepals and petals are not directly involved in reproduction.

9. Scrotum regulates the temperature of testes and maintains it at 35°C, two degree below the body temperature, so as to protect sperms from high temperature.

10. Chromosomes can be seen as thread like structure having specific shape when cell is dividing by which they can be identified.

11. Scrotal sac temperature is less by 2° because sperms are safe at a little lower temperature than body temperature. It is outside the body that is why it has lower temperature than body.

12. Pollen grains contain male gametes in plants and ovules contain female gametes.

13. **Germination:** Involves development of embryo into a seedling.
Fertilisation: It involves fusion of male with female gametes.

14. Diseases that spread through the sexual contact are called STDs
AIDS damages the body's immune system.

15. When egg is not fertilised, blood and mucus comes out through vagina. This process is called **menstruation.**

16. The lining of uterus becomes thick and spongy by the action of progesterone to receive and nurture the development of embryo.

17. Zygote is a single celled fusion product of sperm and ovum whereas embryo is a multicellular product produced by mitotic divisions from zygote.

18. Acquired Immuno Deficiency Syndrome.

19. Hibiscus, Mustard (*Any one*)

IV. 1. The process of transfer of pollens from anther to stigma is called pollination, which takes place only in plants.

Fertilisation is a process in which male sex cell and female sex cell join or fuse together to form zygote. It happens in all living organisms, in sexual reproduction.

2. **Seminal vesicle:** It holds the liquid that mixes with sperm to form semen.

Prostate gland: It secretes fluid adding upto the semen and contains enzymes and other substances. It also provides nutrition to the sperms, in the form of fructose and calcium. It protects sperms.

3. (*i*) The inner uterine wall becomes thick.

(*ii*) More blood vessels develop in its lining.

4. Ovaries contain thousands of immature eggs at the time of birth. Some of these eggs start maturing when girls attain puberty. One egg is produced every month by one of the ovaries.

5. Testes → vas deferens → urethra → penis and then opens to outside.

6. Sperms are motile (movable) and have X or Y chromosomes whereas eggs are non-motile and have X chromosome only.

The sperms can reach to egg for fertilisation because these are motile. Chromosomes in them help in determination of sex of a new born child.

7. (*i*) In sexual reproduction, fusion of male and female gametes takes place, each of their germ cells or gametes contain half the number of chromosomes.

(*ii*) When male and female gametes fuse at the time of fertilisation it restores the original number of chromosomes of parent.

8.

Plumule	Radicle
It is part of growing embryo which gets converted into shoot of young plant.	The part of growing embryo which later forms the root of plant.
It shows positive photoropism and negative geotropism.	It shows negative phototropism and positive geotropism.

9. (*i*) To prevent unwanted pregnancies.

(*ii*) To prevent STD (Sexually Transmitted Diseases).

(*iii*) To have proper gap between two children.

(*iv*) To control population.

(*v*) To have sound health.

10.

Male gamete	Female gamete
It is smaller in size.	It is bigger in size.
It is motile.	It is non-motile.

11. (*a*) Formation of sperms takes place in testes.

(*b*) Prostate gland contributes fluid to the semen.

12. (*i*) *Placenta:* The embryo gets nutrition from the mother's blood with the help of a special tissue called placenta.

Uterus: After fertilisation, embryo gets attached to the walls of uterus.

(*ii*) *Unisexual flowers:* Flowers which contain either stamens or carpels.

Bisexual flowers: Flowers which contain both stamens and carpels.

V. 1. (*i*) Testosterone regulates formation of sperms.

(*ii*) The appearance of secondary sexual characteristics at puberty like beard, genital hair, change in voice is due to testosterone.

2. (*i*) Change in voice.

(*ii*) Increase in size of breasts.

(*iii*) Appearance of hair in armpit and genital hair (pubic hair).

(*iv*) Widening of hips.

(*v*) Rapid physical growth.

(*vi*) Onset of menstruation.

3. The three techniques which prevent pregnancy are:

(*i*) Barrier method, (*ii*) Chemical method (*iii*) Surgical method

Chemical methods are not for males.

The use of contraceptive have a direct effect on the health and prosperity of the family.

(*i*) To avoid unwanted pregnancy–if the woman is not physically or mentally prepared to bear a child her health gets adversely affected.

(*ii*) Contraception allows the parents to space the birth of two children and helps in family planning.

(*iii*) This way they can decide how many children to have and allows them to bring them up properly especially in case of limited resources. (or any other)

4. (*i*) Placenta is a disc like special tissue connection between embryo and uterine wall. It acts as an endocrine gland. It possesses villi that increases the surface area for absorption of nutrients. Facilitates passage of nutrition and oxygen to embryo from mother through blood.

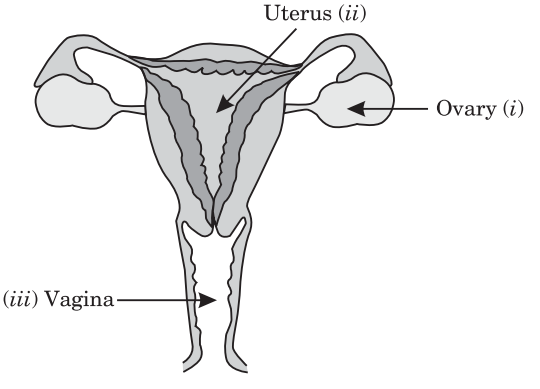
(*ii*) Waste substances produced by embryo are removed through placenta into mother's blood.

(*iii*) Birth of child takes place after the gestation period (9 months inside the womb of mother). When the contractions in muscles of the uterine walls is at highest then the birth of child takes place by the birth canal.

5. (*i*) Ovary produces eggs

(*ii*) Zygote is implanted in womb or uterus

(*iii*) Entry of sperms through vagina.



6. 'A' is anther. It contains pollen grains.

'B' is style. It allows growth in pollen tube up to the ovary from the stigma.

'C' is ovary. It contains ovules.

7. The male reproductive part of an angiosperm is stamen. The female reproductive part is pistil/carpel, which consist of stigma, style and ovary.

Stigma: It is the site for deposition of pollen grains after pollination.

Style: It is a tube that allows growth of pollen tube to reach the ovary.

Ovary: It contains ovules that develops into seeds.

8. (*i*) **Barrier method:** Condom is placed on the erect penis of male before sexual intercourse. In female, a thin rubber disc is placed in the vagina, which covers the opening of cervix.

(*ii*) **Oral pills:** Birth control pills can be taken to prevent pregnancy.

(*iii*) **Surgical methods:** Use of copper-T in females, surgically implanted at the opening of the cervix, prevents entry of sperms.

Vasectomy in males, tubectomy in females can also help in population control. In vasectomy, sperm ducts are cut. In tubectomy, oviducts are tied, blocked or cut. Sperms cannot reach the ova and thus pregnancy is avoided.

9.

Asexual reproduction	Sexual reproduction
Only single parent is needed.	Two parents are involved.
Gametes are not produced.	Male and female gametes are produced.
Offsprings produced are identical to parent.	Offsprings are different from parent.
No mixing of genetic material.	Mixing of genetic material from both the parents.
It is not useful for natural selection in the evolution of species.	It helps in natural selection in the evolution of species.
It is a rapid process, under proper conditions.	It is a slow process.

10. Structure of placenta: It is a special disc like tissue embedded in mother's uterine wall and connected to the foetus/embryo.

Functions of placenta: It provides a large surface area for glucose and oxygen/nutrients to pass from mother's body to the developing/developed embryo/foetus and also helps in passing the waste from the foetus/embryo to the mother's body.

11.

Self pollination	Cross pollination
(*i*) It involves transfer of pollen grains from anther to stigma within the same flower.	(*i*) Cross pollination is the transfer of pollen grains from anther to stigma in another flower of another plants.
(*ii*) It occurs in same flower or in two flowers of same plant.	(*ii*) It occurs between two flowers of different plants but of same species.
(*iii*) Flowers should be genetically same.	(*iii*) It occurs between flowers which are genetically different.

12. Sperm formation takes place at a lower temperature than body temperature therefore testes are located outside the body and its temperature is 2°C below the body temperature.

Functions of Testes:

Endocrine Function: The production of testosterone hormone.

Exocrine Function: The production of sperms.

13. (*i*) Two parents are involved
(*ii*) Two dissimilar gametes are formed
(*iii*) Variations are produced
(*iv*) Occurs in higher and some of lower organisms
(*v*) Fertilisation is needed for zygote formation
(*vi*) It is a slow process.

14. (*a*) (*i*) **Ovary:** It produces ova and female sex hormones.
(*ii*) **Fallopian tube:** It is the site of fertilisation and transfer of female gamete from the ovary.
(*iii*) **Uterus:** Implantation of zygote and it keeps foetus till complete development.
(*b*) (*i*) **Scrotum:** It protects testes.
(*ii*) **Testes:** It produces sperms.
(*iii*) **Vas deferens:** It delivers sperms from testes to urethra.

15. Pollination must occur before fertilisation as it has to reach the male gametes present in pollen grain which will germinate to form a pollen tube and carry the male gametes to the ovum. Pollination is different from fertilisation because here the pollen grain with its male gametes just reaches the stigma, whereas fertilisation of male gamete to ovum results in formation of diploid zygote which is the foundation of new generation.

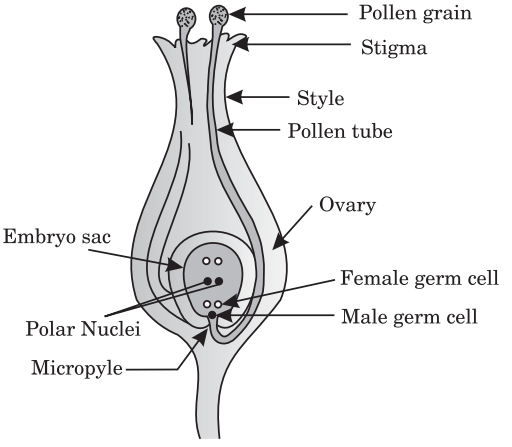
16. (*i*) Ovary ripens and developed into fruit.
(*ii*) Ovules develop into seed.

(*iii*) Petals and sepals wither and drop.

(*iv*) Stigma, style and stamens dry up and fall off.

17. Sperms travel upwards through uterus to oviduct where they may meet an ovum and hence fertilise it. Fertilisation takes place in oviduct to give rise to single celled zygote. The zygote divides to become multicellular embryo which gets fixed in uterus. The embryo remains attached to uterine walls throughout gestation period which is about 40 weeks in humans.

18.



19. The basic requirements for sexual reproduction to take place are involvement of two parents and fusion of their haploid gametes. In the sexual reproduction, a new individual is formed by the fusion of two haploid gametes, one from the male parent and the other from the female parent. Since the new individual formed is diploid in nature, the gametes must be formed by meiosis, so that chromosome number can be reduced to half. When fusion of gametes occurs, the two nuclei of these two gametes fuse and the chromosome number is restored to normal. The zygote, thus formed is diploid in nature.

Importance of sexual reproduction:

Sexual reproduction involves fusion of male and female gametes coming from both the parents. The fusion of these gametes results in genetic variations in the offsprings. This way sexual reproduction promotes diversity of characters in offsprings by providing genetic variations. These genetic variations, thus lead to evolution of species as well as allow the organisms to become better adapted in the changing environment.

20. (*a*) When the implantation has occurred in uterus of the mother, the inner lining of the uterus thickens and is richly supplied with the blood vessels to provide nourishment to the growing embryo.

(*b*) If the egg is not fertilised, it lives for about one day. Since, the thickened uterus lining is no more required, it will slowly break down and come out through the vagina as blood and mucus known as menstruation which lasts for about two to eight days.

21. The four main steps involved in sexual reproduction are:

(*i*) In the first stage of sexual reproduction, meiosis process occurs and the number of chromosomes reduces from diploid (2n = 46) to haploid (n = 23) for each gamete.

(*ii*) In the second stage, there is transfer of male gametes into the female body.

(*iii*) In the third stage, the two gametes will fuse together after fertilisation, a single male gamete will fuse with a female gamete. i.e. fertilisation process takes place.

(*iv*) After fusion of male and female gametes, they form a zygote, in which the number of chromosomes is restored to diploid (2n = 46).

The two main advantages of sexual reproduction are:

(*i*) There are more variations, which leads to better adaptability of the offsprings in the environment.

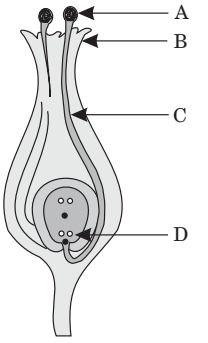
(*ii*) Promotes the diversity in the characteristics of offspring, because it results by fusion of gametes.

22. Any one of the following differences:

(*i*) In sexual reproduction two opposite sexes are involved whereas in asexual reproduction only one individual is involved.

(*ii*) In sexual reproduction male and female gametes formation take place whereas in asexual reproduction no gamete formation occurs.

- Sexually reproducing organisms have better chances of survival.
- This is because more variations are generated.



VI. 1. (*i*) 'A' is stigma, 'B' is pollen tube, 'C' is ovary and 'D' is egg cell (female germ cell).

(*ii*) Pollination is a process of transfer of pollen grains from the anther of stamen to the stigma of carpel. It is necessary for fertilisation by sexual reproduction.

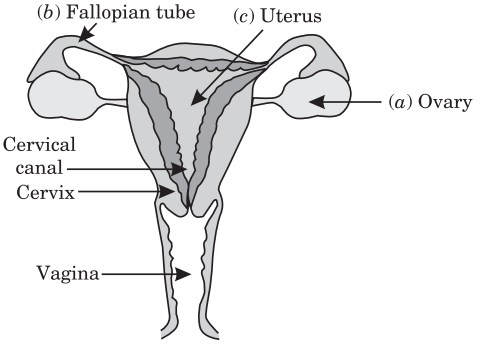
(*iii*) When male gamete and egg fuse together to form zygote, it is called fertilisation. It takes place in ovule. After that the ovule develops a tough coat and is gradually converted into seed.

Fruit: The ovary grows rapidly and ripens to form a fruit after ovule has been fertilised.

2. (*i*) (*a*) Egg develops in ovary.

(*b*) Fertilisation takes place in fallopian tube.

(*c*) The fertilised egg gets implanted in uterus.



(*ii*) (*a*) The inner uterus lining becomes thick to receive the zygote and is supplied with blood and nutrients to nourish the embryo.

(*b*) The inner uterus lining breaks and released in the form of blood and mucus through vagina.

3. Significance of reproductive health in society are:

(*i*) Prevent STD (Sexually Transmitted Disease)

(*ii*) Advantages of small family

(*iii*) Less mortality among new borns

(*iv*) Reduces cases of maternal mortality

Two areas of Improvement are:

(*i*) Family planning. (*ii*) Decrease in STD cases.

4. (*a*) (*i*) Formation of sperms and change in appearance.

(*ii*) Thick hair growth on face stet and pubic region and change in voice.

(*b*) A tube grows out of the pollen grain and travels through the style to the ovary.

(*c*) Zygote is formed *i.e.* fertilisation takes place.

(*d*) Each piece grows into new organism.

(*e*) Buds may fall on the soil and change into new organism.

5. Two causes of human population explosion are:

(*i*) Reduced mortality rate due to better medical facilities.

(*ii*) Desire for male child.

(*iii*) Less awareness of birth control methods.

(*iv*) Illiteracy and poverty. (*Any two*)

Methods to check population explosion are:

(*i*) By using contraception methods.

(*ii*) Awareness among people of the advantage of small family.

6. (*a*) The organ that produces sperms as well as secretes male hormone is testis. The hormone secreted by it is testosterone. Its important functions are as follows:

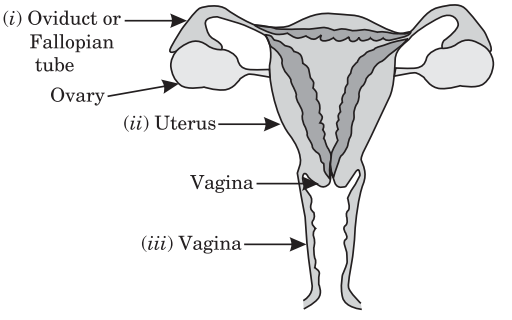
It stimulates sperm production.

It stimulates the development of secondary sexual characters in males like growth of beard hairs, low pitch voice, etc. It involves in the development, maturation and functioning of the male accessory sex organs like vas deferens and seminal vesicles

(*b*) In human female reproductive system, the process of fertilisation takes place in one of the fallopian tubes.

(*c*) The embryo gets nutrition from the mother's blood with the help of a special tissue called placenta. Placenta is a vascular membranous organ that connects the developing foetus to the uterine wall of the mother. It contains villi on the embryo's side of the tissue. On the mother's side are blood spaces, which surround the villi. This provides a large surface area for glucose and oxygen to pass from the mother to the embryo. The placenta draws nutrients and oxygen, which it supplies to the foetus, from the maternal circulation. In turn, the placenta receives carbon dioxide and wastes of foetal metabolism and discharges them into the maternal circulation for disposal.

7. (*a*) (*i*) Fallopian Tube/Oviduct
(*ii*) Uterus
(*iii*) Vagina



(*b*) People prefer use of condoms as it prevents STDs/gives privacy to the user. Condoms help create a mechanical barrier preventing meeting of sperms and ovum.

8. (*i*) Prostate glands and seminal vesicle add their secretions so that the sperms are in a fluid state and it makes their transport easier and also provides nutrition to sperms. Testes secrete testosterone hormone which brings about changes in the appearance in the boys at the time of puberty.

(*ii*) Female foeticides/illegal sex selected abortion of female child.

(*iii*) Interfere in release of egg and eggs are not released.

9. (*a*) (*i*) Barrier method, (*ii*) Oral pills, (*iii*) Use of copper-T, (*iv*) Vasectomy in males, tubectomy in females.

(*b*) • It is because female foeticide is increasing.
• It leads to unbalanced sex ratio i.e., more males, less females.
On long run, it will help in maintaining healthier (equal) sex ratio.
It will save mothers from illegal medical termination of pregnancy and health issues.

(*c*) Gonorrhoea and syphilis are bacterial infections.
Warts and HIV-AIDS are viral infections.

10. [*Diagram drawn and annotated with the following points will also be considered*]

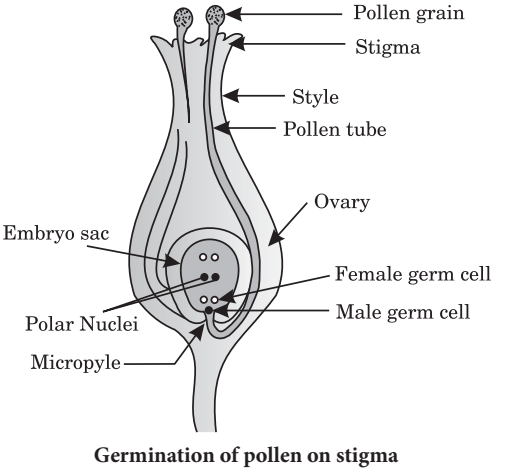
– Stamen is the male reproductive part and it produces pollen grains.

• The ovary contains ovules and each ovule has an egg cell.

• The pollen needs to be transferred from the stamen to the stigma.

• If this transfer of pollen occurs in the same flower, it is referred to as self-pollination./ On the other hand, if the pollen is transferred from one flower to another, it is known as cross-pollination.

After the pollen lands on a suitable stigma, it has to reach the female germ-cells which are in the ovary. For this, a tube grows out of the pollen grain and travels through the style to reach the ovary/Figure



Germination of pollen on stigma

• The male germ-cell produced by pollen grain fuses with the female gamete present in the ovule.

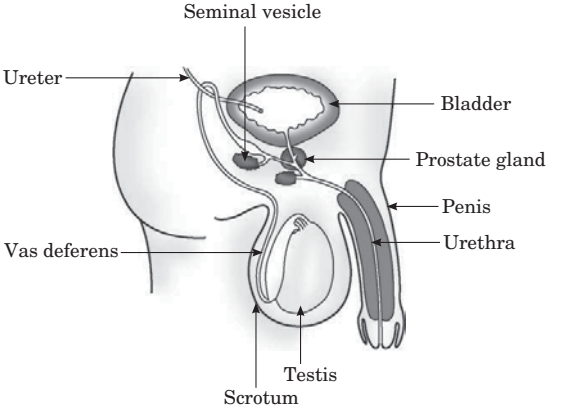
• This fusion of the germ-cells or fertilisation gives the zygote.

• After fertilisation, the zygote divides several times to form an embryo within the ovule.

- The ovule develops a tough coat and is gradually converted into a seed. The ovary grows rapidly and ripens to form a fruit.
- Meanwhile, the petals, sepals, stamens, style and stigma may shrivel and fall off.

CASE STUDY QUESTIONS

1. The male reproductive system consist of portions which produce the germ-cells and other portions that deliver the germ-cells to the site of fertilisation. Testes are located outside the abdominal cavity in scrotum because sperm formation requires a lower temperature than normal body temperature. It also has a role of secretion of male sex hormone which brings changes in appearance seen in boys at the time of puberty. Vas deferens unites wih a tube coming from urinary bladder. Urethra is a common passage for sperms and urine. Prostate gland and seminal vesicles add their secretions so that sperms are now in fluid.



Human-male reproductive system

(*i*) Name the sex hormone associated with males.

(*a*) Testosterone (*b*) Progesterone

(*c*) Oestrogen (*d*) None of these

(*ii*) Which of the following statements is incorrect ?

(*a*) Sperms are present in a fluid

(*b*) Fluid provides nutrition to sperms

(*c*) Fluid makes easier transportation of sperms

(*d*) Fluid helps to bind the sperms together

(*iii*) Testes are located outside the abdominal cavity in scrotum because

(*a*) sperms formation requires higher temperature than body temperature

(*b*) sperms formation requires lower temperature than body temperature

(*c*) it is easier to transport sperms from the scrotum

(*d*) None of these

(*iv*) Which of the following statement is incorrect?

(*a*) Sperms and urine has a common passage from urethra.

(*b*) Sperms have long tail that helps them to move forward.

(*c*) Sperms contain genetic material.

(*d*) Sperms formation requires 1–3°C higher temperature than normal body temperature.

(*v*) What is the nature of semen?

(*a*) slightly acidic (*b*) Neutral (*c*) Slightly basic (*d*) Strongly basic

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

2. Study the table related to sex ratio of females/1000 males in different states and answer the questions that follow:

State	2013-15	2012-14
Andhra Pradesh	918	919
Assam	900	918
Bihar	916	907
Chhatisgarh	961	973
Delhi	869	876
Gujarat	854	907

Haryana	831	866
Himachal Pradesh	924	938
Jammu & Kashmir	899	899
Jharkhand	902	910
Karnataka	939	950
Kerala	967	974
Madhya Pradesh	919	927
Maharashtra	878	896
Odisha	950	953
Punjab	889	870
Rajasthan	861	893
Tamil Nadu	911	921
Uttar Pradesh	879	869
Uttrakhand	844	871
West Bengal	951	952
India	**903**	**914**

(*i*) Name the state which has males to female ratio to maximum extent in 2013-15.

(*a*) Haryana (*b*) Kerala (*c*) West Bengal (*d*) Uttar Pradesh

(*ii*) What is major cause of less females than males in India?

(*a*) Male Foeticide (*b*) Female Foeticide (*c*) Natural (*d*) None of these

(*iii*) Which test is responsible for female foeticide?

(*a*) UV-Spectroscopy (*b*) Ultrasound (*c*) MRI (*d*) X-Ray

(*iv*) Which state of India has lowest sex ratio in 2013-15?

(*a*) Punjab (*b*) Odisha (*c*) Haryana (*d*) Delhi

(*v*) Which of the following state improves sex ratio in 2013-15 from 2012-14?

(*a*) Delhi (*b*) Karnataka (*c*) Bihar (*d*) Kerala

Ans. (*i*) (*b*) (*ii*) (*b*) (*iii*) (*b*) (*iv*) (*c*) (*v*) (*c*)

ASSIGNMENT

Total Marks : 20

I. Multiple Choice Questions (1 Mark)

Choose the correct answer from the given options.

1. A feature of reproduction that is common to *Amoeba*, *Spirogyra* and Yeast is that

(*a*) they reproduce asexually (*b*) they are all unicellular

(*c*) they reproduce only sexually (*d*) they are all multicellular

2. In *Spirogyra*, asexual reproduction takes place by

(*a*) breaking up of filaments into smaller bits

(*b*) division of a cell into two cells

(*c*) division of a cell into many cells

(*d*) formation of young cells from older cells.

II. Assertion-Reason Type Questions (1 Mark)

Note: Use instructions as given in exercises of the chapter.

1. Assertion: STD are sexually transmitted diseases.
Reason: AIDS is STD.

2. Assertion: Gonorrhea and Syphilis are bacterial infections.
Reason: Health of women will not be affected if she adopts contraceptive measures.

III. Very Short Answer Type Questions (1 Mark)

1. Which type of vegetative propagation is grafting?

2. Mention the information source of making proteins in the cell. What is the basic event in the reproduction?

IV. Short Answer Type Questions-I (2 Marks)

1. Why should a woman take oral pills after consulting doctors?

2. List any two differences between pollination and fertilisation.

3. How is the process of pollination of different from fertilisation?

V. Short Answer Type Question-II (3 Marks)

1. What is reproduction? Mention the importance of DNA copying in reproduction.

VI. Long Answer Type Question (5 Marks)

1. Define pollination. Explain the different type of pollination. List two agents of pollination? How does suitable pollination lead to fertilization? [*Delhi* 2019]