

# How do Organisms Reproduce?

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## Check Point 01

**Q. 1. Name the blueprint responsible for making all basic body designs.**

**Answer:** DNA (Deoxyribonucleic acid) is considered as the blueprint for making all basic design of an organism.

The DNA is present in the nucleus of a cell in the form of a condensed structure called chromosome.

**Q. 2. Incorrect DNA copying can alter the reproduction process. List the effect of such a case.**

**Answer:** When DNA replication occurs, due to some natural or artificial conditions wrong nucleotide base pairs could get attached and this may lead to “mutations.”

Now, these mutations could be non-harmful or harmful depending upon the sequence of DNA in which it occurred. One such example is “Down syndrome” in which there exists an extra copy of chromosome number 21 leading to several abnormalities.

**Q. 3. What is the significance of body design in determining the habitat of an organism?**

**Answer:** Body design/ morphology of an organism defines the way how much he is fitted or suitable for a specific habitat. E.g.- a bacteria doesn't need big houses or area to survive and also it's nutritional requirements are very less but humans, on the other hand, need much larger space and have complex nutrition system. A fish can survive under water because of gills but a bird or human cannot.

**Q. 4. An existing population of birds was suddenly wiped out from an area. Give a suitable reason for the same.**

**Answer:** There could be numerous causes for this,

- a) There was some natural calamity like tornado or storm that caused it.
- b) - There was no food left for those birds in that area.
- c) - Due to human intervention environment in that area, survival became unsuitable for them.
- d) The population of their predator might have grown huge which ate all birds.

But taking into consideration, it was a mass extinction which occurs mostly due to environmental factors.

**Q. 5. How does the reproduction process can be classified on the basis of germ cells involved?**

**Answer:** On the basis of germ cells involved reproduction is of 2 Types,

a) Asexual reproduction: A single parent organism reproduces by the fragmentation of the cell of the parent organism to form daughter organism, thus includes processes like fission, budding, fragmentation, regeneration. E.g.:- Hydra, Yeast reproduce by the mode of asexual reproduction.

b) Sexual reproduction: - It involves the fusion of gametes from 2 sexually opposite parents one of them is called male, and other is female. E.g.: - mammals, plants reproduce by the mode of sexual reproduction.

**Q. 6. Give one advantage of the asexual mode of reproduction.**

**Answer:** Asexual mode of reproduction occurs very fast as it include processes like budding, fission, etc. While the sexual mode is very slow. Clones can be produced by asexual mode of reproduction but sexual mode cannot produce clones since there is a step called crossing over during cell division in sexual reproduction that leads to variations.

**Q. 7. Give one difference between sexual and asexual reproduction.**

**Answer:** Asexual reproduction does not involve fusion of male and female gametes thus zygote formation doesn't take place, and it is a quick method of reproduction while in sexual reproduction fusion of male and female gametes occur, and then zygote is formed, and these processes take a lot of time.

## **Check Point 02**

**Q. 1. Name the mode of reproduction occurring in Amoeba.**

**Answer:** "Binary fission"

In this, the cytoplasm and nucleus of parent cell divide equally into two daughter cells, and no mitosis occur.

Q. 2. "Multicellular organisms can also reproduce asexually." Give an example to support the above statement.

**Answer:** Yes, basically asexual mode of reproduction involves only 1 parent and processes like meiosis, gamete production, fertilization, parthenogenesis, and transfer of gametes between two individuals does not occur,

In fungi and algae spores like zoospores, conidia, etc, are formed asexually.

Also in plants, vegetative reproduction in which a specific plant part, e.g. - eyes in potato, bulbils tubers, etc. can form a complete plant and is another example of asexual reproduction in multicellular organisms.

**Q. 3. A student noticed that an organism by mistake was cut into parts. After some time, both developed into new individuals.**

**(i) Name the mode of reproduction followed by the organism.**

**(ii) Give an example or organism which multiply by this process.**

**Answer: i)** Mode of reproduction followed here is Regeneration.

In some organisms, each body cell possesses the ability to proliferate and form a complete body.

**ii)** e.g.- Planaria, Hydra

**Q. 4. A plant that has lost the capacity to produce seed. Name a process using which it can reproduce?**

**Answer:** "Vegetative reproduction"

Plant body parts like roots, tubers, bulbils, stem, leaves, buds possess the ability to proliferate into parent plant if grown under correct conditions and the property is called "Totipotency".

**Q. 5. Name the kind of organisms that reproduce by spore formation.**

**Answer:** Mostly lower organisms like algae, fungi, and bacteria lead to spore formation.

E.g.- Albugo, Phytophthora.

**Q. 6. What are the advantages of vegetative propagation?**

**Answer:** a) Maintain genetic stability. The plants produced are generically similar to the parent plant and have all its characteristics.

b) Plants raised by vegetative propagation can bear flowers and fruit earlier than those produced seeds.

c) It also makes possible the propagation of plants such as banana, orange, rose and jasmine, which have less capacity to produce seeds.

**Q. 7. Name two plants which are grown by the technique of tissue culture.**

**Answer:** Tissue culture is a technique in which a plant tissue can be used to generate a complete plant under lab conditions.

E.g.:- Orchids, Nepenthes

**Q. 8. Why do spores remain viable during unfavorable conditions?**

**Answer:** Sporulation occurs under an unfavorable environment like high temperature, ph., etc. Where a normal cell cannot survive. So bacteria and fungi can convert their cells into a spore. These spores have all the nutrition required for growth but have very less water content which makes it hard and unreactive to the harsh environment. Also, some spores have an extra protective covering of lipids, polysaccharides or some proteinaceous substance that makes it withstand the harsh environment.

### **Check Point 03**

**Q. 1. What is Zygote?**

**Answer:** Zygote is the product when male and female gametes fuse under sexual reproduction. This zygote is diploid mostly and develops into a whole new organism.

**Q. 2. Give one difference between bisexual and unisexual flowers.**

**Answer:** Most plants have both male and female reproductive organs in the same flower and are known as bisexual flowers, E.g lily, rose, Hibiscus, mustard, etc. While others have either male or female reproductive parts in a flower known as unisexual flowers, E.g papaya, watermelon, etc.

**Q. 3. What constitutes a female reproductive part in a flower?**

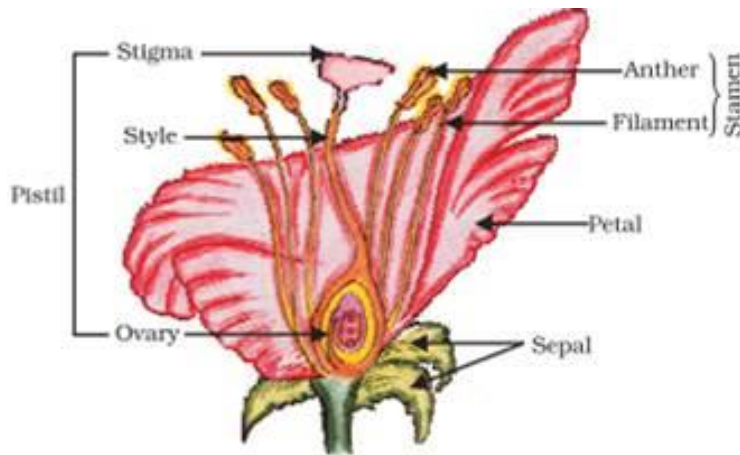
**Answer:** Carpel is the female reproductive part in plants.

This Gynoecium consists of three parts,

- Stigma: It is the terminal part of carpel which may be sticky. It helps in receiving the pollen grains.

- **Style:** It is the middle elongated part of carpel. It helps in the attachment of stigma to the ovary.
- **Ovary:** It is the swollen bottom part of carpel. It contains ovule having an egg cell.

The diagram is shown below:



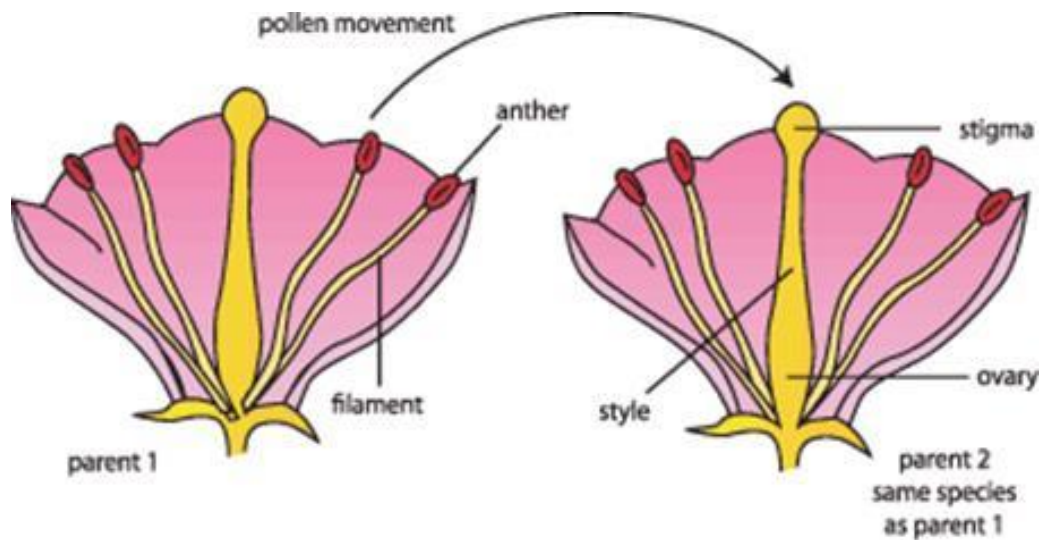
**Q. 4. What are various agents of pollination?**

**Answer:** Pollinators could be,

- Biotic pollinators:** - These include living organisms such as animals, insects, and humans.
- Abiotic pollinators:** - These include non-living vectors or natural carriers such as wind, water, gravity, fire etc.

**Q. 5. State one reason why cross-pollination is preferred over self-pollination.**

**Answer:** Cross-pollination is the transfer of pollen from the flower of one plant to the stigma of the flower of another plant, as shown below:



Due to this, cross-pollination brings about recombination, variations, helps in the production of new varieties and disease resistant plants.

Q. 6

Where can zygote be found in flower after fertilization?

Answer

After the fertilization process is done, i.e. male nucleus from pollen fused with a female nucleus in the egg cell inside ovary of a flower, this newly fertilized egg develops into zygote inside the ovary.

**Q. 7. 'The seed contains the future plant.' Why is it said so?**

**Answer:** After fertilization, ovules develops into seeds. These seeds could be monocot (with one cotyledon) or dicot (with two cotyledon) depending upon the plant variety. These seeds contain the embryo, plumule, and radicle. Plumule develops in to shoot while Radicle develops into roots.

**Q. 8. The fruit is developed from which floral part?**

**Answer:** Ovary of the flower develops into fruit after fertilization.

### Check Point 04

**Q. 1. What changes take place in boys during the reproductive phase?**

**Answer:** In boys puberty starts near 14-15 years of age.

During this phase,

- Body is larger, more muscular, and stronger.
- Beard, moustache and chest hairs start appearing.
- Shoulders become broad.
- Voice becomes low pitched.
- Behavior becomes a little aggressive because of a spike in testosterone levels.
- Development of Adam's apple is there.

**Q. 2. What is responsible for attainment of sexual maturity in both males and females?**

**Answer:** Sexual maturity is attained due to the secretions of sex organs “testis” and “ovaries” in males and females respectively.

These secretions are Testosterone (male sex hormone) and Progesterone and Estrogen (female sex hormones) at puberty.

**Q. 3. Sperms are produced in testis, how do they reach the urethra for further passage into the female reproductive tract?**

**Answer:** Testis are connected to the urethra with the help of a 40 cm long tube-like structure called "Vasa Deferentia". It is slightly coiled at first near testis but then becomes straight as it enters the abdominal cavity where it passes over urinary bladder and joins the urethra.

**Q. 4. What is the function of testosterone in males?**

**Answer:** Testosterone is the male sex hormone called “Androgen”. Testosterone's secretions are at peak during male puberty and it is responsible for bringing about all the reproductive changes like beard, muscular body, penis enlargement, pubic hairs, etc.

**Q. 5. Name the organ responsible for secreting seminal fluid.**

**Answer:** Seminal fluid is the combination of secretions from accessory sex glands and mucus gland to the sperms i.e. sperms together with secretions from seminal vesicles, prostate gland, preputial gland and Cowper’s gland form a seminal fluid.

**Q. 6. What is the function of the Fallopian tube in the female reproductive system?**

**Answer:** Fallopian tube or oviducts is about 10 to 12 cm long muscular tube. It has a funnel shaped opening near the ovary.

It carries ova or egg from ovary to the uterus and is the site of fertilization.

**Q. 7. What is placenta? Discuss its role in the human body.**

**Answer:** Placenta is a reddish brown disc that attaches to the wall of the uterus and the umbilical cord arises from it. Placenta form finger like projection called the villi toward embryo. This creates large surface for the exchange of glucose and oxygen between mother and the embryo.

**Q. 8. What happens when fertilization does not occur in a female body?**

**Answer:** In female, ovaries release ovum or egg once every 28 days from the age of puberty. The uterus prepares itself every month to receive a fertilized egg. Thus, its lining becomes thick and spongy. If the egg is not fertilized it lives for about one day. Afterwards this lining of uterus is no longer required and menstruation occurs.

Menstrual is the time of uterine bleeding in which an unfertilized egg and the thick uterine lining. It occurs through the vagina as blood and mucus.

## Chapter Exercise

**Q. 1. Name the individual units of floral whorls.**

**Answer:** "Sepal" is the individual leaf segment of the calyx.

**Q. 2. What type of cell division occurs in Plasmodium during reproduction?**

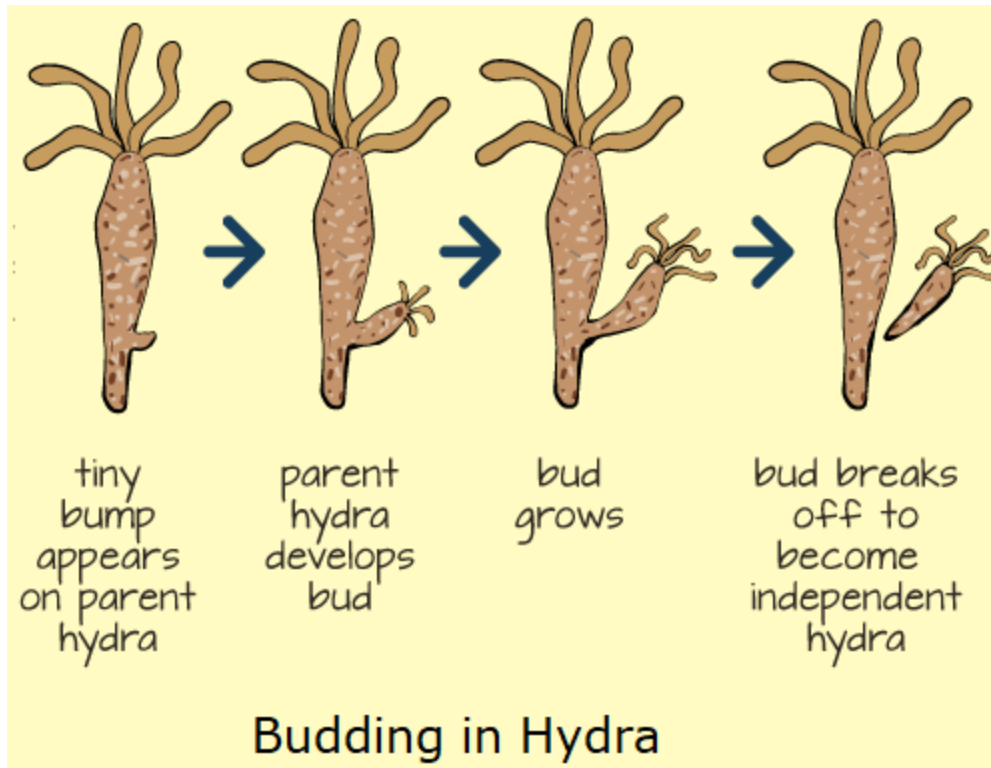
**Answer:** Multiple fission occur in which parent cell is divides into multiple identical daughter organism at the same time.

**Q. 3. What will happen if Hydra is cut into many pieces?**

**Answer:** Hydra reproduce by the mode of "Budding" which is a type of asexual reproduction.

When Hydra is divided into pieces, each part acts as a bud. Each bud grows and gradually assumes the form and size of the parent.

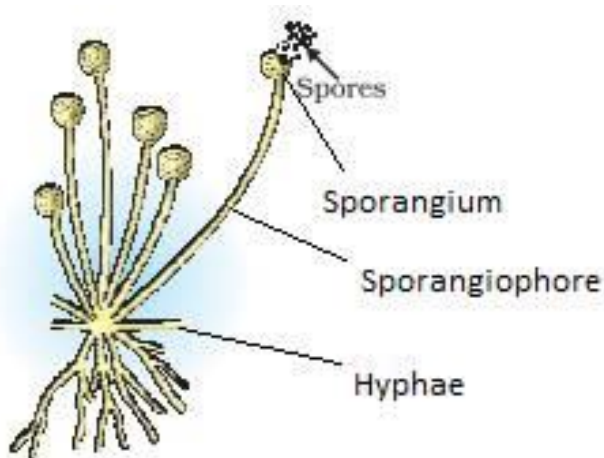




**Q. 4. Some of the fungal hyphae are aerial and bear black blobs. What are these bulb-like structures on sticks called in Rhizopus?**

**Answer:** These structures are called "Sporangiospores".

A sporangium is an outside covering containing these spores, these are non-motile and are dispersed by wind. When germinated form new mycelium.



**Q. 5. Write the dual purposes served by urethra in males.**

**Answer:** Human penis conducts urine as well as semen, but the two cannot pass at the same time.

The urethra acts as a common passage for both the sperm and urine.

**Q. 6. Delivery of sperms from where they are produced to the urethra is facilitated by which part?**

**Answer:** Sperms are produced in the "Testis".

From the testis, they reach urethra via vasa differentia, epididymis and then vasa deferens which is a 40 cm long tube, joins and release the secretions in the urethra.

**Q. 7. Which one is one STD among the following? AIDS, diarrhea, genital warts, syphilis.**

**Answer:** AIDS

STD is "sexually transmitted disease". Out of all only AIDS is transmitted via. Sexual contact between an HIV positive and normal person.

**Q. 8. Is variation more beneficial for the species or for the population? How?**

**Answer:** Variations is more beneficial for the species than for the population. During reproduction, copying of DNA takes place which is not 100% accurate, thereby causing variations are favourable they help the individuals to survive and pass there, variations to their progeny. Depending upon the nature of variations, different individuals have different upon the nature of variations, different individual have different advantages, which promotes their survival like bacteria which can withstand heat will survive better in heat wave.

**Q. 9. What is the part played by stamens and carpels in sexual reproduction?**

**Answer:** "Stamens" and "Carpels" are male and female reproductive parts of a flower respectively. Stamens lead to the formation of pollen grains while carpels include three parts which are stigma style and ovary. During sexual reproduction, it is the process of fusion of male germ cell with the female gametes. It gives rise to zygote. The pollen lands on suitable stigma, it reaches the female ferm cells in ovary. The pollen tube grows out of the pollen grain, travels through the style and finally reaches the ovary.

**Q. 10. Why is cross-pollination considered to be superior to self-pollination?**

**Answer:** Cross-pollination is superior to self-pollination in ways mentioned below,

- It brings about genetic recombination and production of new varieties.

- Cross-pollination results in healthy and stronger offspring.
- Variations are caused due to this.
- It leads to the production of seed in self-sterile plants.

**Q. 11. Differentiate between an ovum and a zygote.**

**Answer:** The following table gives the difference between ovum and zygote:

<b>Ovum</b>	<b>Zygote</b>
The female gamete is called ovum. Also called as an egg.	It is the product formed by the fusion of male and female gametes
During fertilization the ovum and sperm fuse to form zygote.	After fertilization zygote divides many times and embryo is formed within ovule.
Ovum is present in an immature form in all the female	Zygote is fertilized egg or ovum

**Q. 12. Explain some changes seen in boys during puberty.**

**Answer:** In boys puberty starts near 14-15 years of age. During this phase testosterone level spikes and is responsible for all the changes which are,

- Body is larger, more muscular, and stronger.
- Beard, moustache and chest hairs start appearing.
- Shoulders become broad.
- Voice becomes low pitched.
- Behavior becomes a little aggressive because of a spike in testosterone levels.
- Development of Adam's apple is there.
- Enlargement of the penis and appearance of pubic hairs.

**Q. 13. Give an example of IUCD for females? What is its mechanism of action?**

**Answer:** "Copper-T" is an example of IUCD for female.

These devices are placed in the uterus of the female by a doctor. The copper-T shaped device made of copper inserted into the uterine cavity by a doctor or nurse and left there for certain period for the contraception purpose. It works by stopping the egg and the sperm surviving in the fallopian tubes can also prevent the fertilized egg implanting in the womb.

The copper in copper-T act as a spermicides with in uterus also.

**Q. 14. Name one STD caused by a bacterial infection and one by a viral infection. How can these be prevented?**

**Answer:** Gonorrhoea and syphilis are caused by bacterial infection while HIV and Genital warts is a viral STD.

In order to prevent STD'S,

- One must avoid having copulation with an unknown person or an infected person
- Always use protection
- Avoid any instances that include the transfusion of blood.
- Do not share infected needles or surgical instruments with an infected person

**Q. 15. The normal body growth slows down, and reproductive tissues begin to mature during puberty? Give reason.**

**Answer:** Normal growth is controlled initially by growth hormones and thyroid but during puberty, a third factor comes into the consideration which is sex hormones. In males, between the age of 10 to 13 puberty begins and lasts till 16 to 18 years of age while in girls puberty starts at around 11 to Twelve years of age and lasts till 16 to 17.

During this period of puberty, the growth of body is controlled by the sex hormones and the normal body growth becomes very slow because the sex hormones tend to emphasize more on reproductive tissues than rest of body.

**Q. 16. Give a few characteristics of asexual reproduction.**

**Answer:** Production of offspring by a single parent without the formation and fusion of gametes are called asexual reproduction.

Characteristics of asexual reproduction.

1. It is rapid mode of multiplication.
2. Cell division takes place either mitotically or amitotically.

3. The new individuals produced after cell division are always genetically identical or clone to their parents.

4. A single parent is involved, i.e opposite sexes are not involved.

5. It does not involve the fusion of gametes.

**Q. 17. When is vegetative propagation used? Name any three methods of vegetative propagation.**

**Answer:** Vegetative propagation is a form of asexual reproduction that occurs in plants.

There are certain parts of plants that possess the ability to get developed into a complete parent plant when they are grown under correct nutrition.

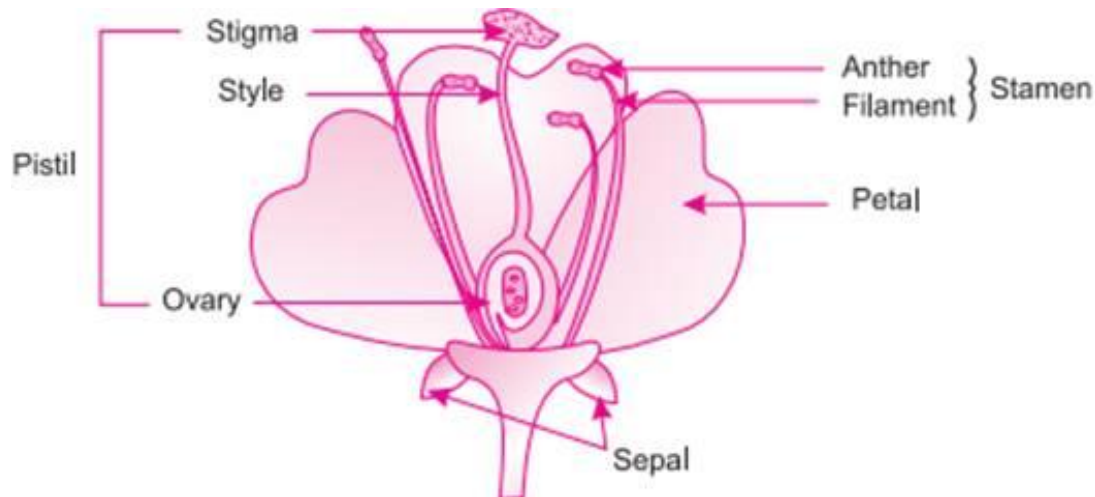
Plant parts such as roots, stem, leaves, buds flowers, anthers and ovary possesses the ability to get developed into a complete parent plant tassels possesses a special property called as “totipotency” which is responsible for this phenomenon.

Now there are certain methods of vegetative propagation which includes

- Grafting
- Cuttings
- Mound layering
- Side grafting
- Wedge grafting
- Propagation by plant tissue culture or also called as micro propagation.

**Q. 18. Draw a neat and labeled diagram showing longitudinal section of a bisexual flower.**

**Answer:** The answer is given below:



Stamen and carpels are the reproductive parts of a flower.

**Stamen:** It is the male reproductive part of the flower.

**Anther:** It is bilobed structure containing two pollen sacs present at tips of stamen. These produces pollen grains that are yellowish in colour.

**Carpel:** It is the female reproductive part, which is present in the flower center.

**Stigma:** it is terminal part of carpel which may be sticky. It helps in receiving the pollen grains during pollination.

**Style:** it is the middle elongated part of the carpel. It helps in the attachment of stigma to the ovary.

**Ovary:** It is the swollen bottom part of carpel. It contain ovules having an egg cell.

**Q. 19. What is implantation? Where does it take place? Mention the structure involved and its function.**

**Answer:** The embryo sinks down and reaches into soft and thick lining of the uterus. The embedding of the embryo in the thick lining of uterus is called implantation.

The implantation occurs in the uterus.

The placenta is a grows into a disc like structure between uterine wall and the embryo. Placenta forms finger like projection called villi towards embryo. This creates large surface area for the exchange of glucose and gasses between mother and embryo.

**Q. 20. Name the organ where ova are formed inside the body. Trace their pathway from formation to Fertilization.**

**Answer:** Female reproductive gametes are “ova” or “egg.”

The ova are produced inside the ovary when a girl reaches its stage of puberty, this egg or ova produced is carried from ovary through the fallopian tube to the womb or we can say to the uterus.

In the uterus, the male reproductive gamete or sperms arrives, it fertilizes the egg, and then zygote is formed which on development leads to the formation of foetus.

**Q. 21. What does HIV stand for? Is AIDS as an infectious disease? List any four modes of spreading AIDS.**

**Answer:** HIV is a human immunodeficiency virus.

This causes a disease, or we should say a collection of diseases called AIDS.

AIDS is a viral disease which could spread through any activity that includes blood transfusion or direct sexual contact.

AIDS is an STD how it spreads could include,

- Unprotected copulation
- Sharing of infectious needles
- Transfusion of blood between a normal and infected person
- It can also be transmitted from an infected mother to the fetus.

**Q. 22. Explain**

**(i) Population control**

**(ii) Advantage of using contraceptives.**

**Answer:** i) Human population has increased drastically over the years.

According to the data, the human population is doubling every 35 years so we need a way or a method that could provide full stop solution or that could prevent this explosion of population. The Methods that could help in controlling the overpopulation or the population explosion are considered as population control. Population control doesn't mean that we need to kill people or remove population already present on the earth It is a way in which the population or we should say the coming population is planned or it is a planned control of population.

ii) Contraceptives are the most used and the safest methods of birth control. Contraceptive includes the use of condoms, UID and other surgical methods that could provide a method to avoid unwanted pregnancy.

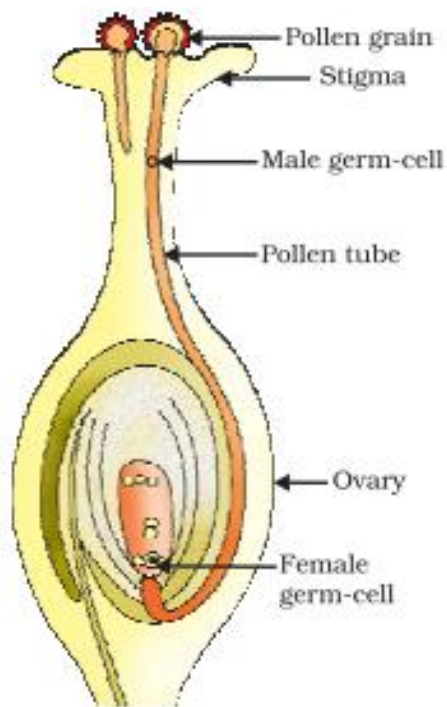
Using contraceptives reduces the risk of STD.

Pregnancy at an early stage of a woman could adversely affect her body and her mind so to prevent that contraceptives are used. To control the exploiting population contraceptives play a major role.

**Q. 23. Draw a neat diagram of fate of pollen after landing on stigma. Also, label the following parts.**

- (i) Female germ cell
- (ii) Pollen tube
- (iii) Pollen grain
- (iv) Male germ cell

**Answer:** The diagram is given below:



The above diagram shows the process of germination of pollen on stigma.

**Q. 24. What is the function of anther? How does fusion of male and female gametes take place in plants?**



**Answer:** Anthers are male reproductive parts of plants. They are bi-lobed and are connected with a long tube like structures called filament.

Anther is responsible for the formation of pollen grains. Pollen grains, when formed, are stored inside the anther when pollen matures they exert pressure on the inside wall of anther causing it to burst and release the pollen outside. Now these pollens reaches the stigma of the female flower by pollinators.

Once pollen lands on the stigma, certain interactions occur and pollen absorbs water and swells leading to the formation of the pollen tube. This pollen tube is a hollow tube which enters stigma, travels through style and penetrates inside ovary. Through this pollen tube, male nuclei reach the egg and fertilization takes place.

**Q. 25. (i) State any three characteristics of sexual reproduction.**

**(ii) Explain, what happens to the egg once it gets fertilized in a human female?**

**Answer:** i) • Sexual reproduction includes crossing over of chromosomes which leads to variations.

- These variations are responsible for making the existing species better and healthier and then ultimately to evolution.

- Sexual reproduction could also lead to speciation which is the formation of new species from the pre-existing one.

- Since it involves 2 parents so, the offspring receive characteristics from both the parents. Also, it is a time-consuming process so it somehow controls the population explosion which could have been there due to asexual reproduction.

ii) After the 14th day of menstruation cycle, the egg is taken to the uterus where it waits for the sperm to reach and fertilize it.

Female receives sperms after sexual intercourse, sperms travel through the vagina and reaches the egg in the uterus and fertilize it. After fertilization zygote is formed. zygote divides and forms an 8 celled structure called blastocyst. This blastocyst attaches itself to the uterine wall by a process called implantation. From here it further divides and develops into a fetus and then ultimately into a baby.

**Q. 26. Give reasons why a woman should avoid frequent pregnancies. Explain the following methods of contraception giving one example of each.**

**(i) Barrier method**

**(ii) Chemical method**

**Answer:** Pregnancy is a very complex process. It includes a the very long period of around 9-10 months. A woman has to suffer a lot of hormonal changes during this period and also her inner body needs recovery after one pregnancy because it has undergone a lot of wear and tear during fetal development and mostly during labor.

According to doctors, there should be a gap of 3 years between subsequent pregnancies.

In order to prevent unwanted pregnancy, Contraceptives should be used.

i) Barrier method includes preventing the entry of sperms inside the vagina, so that it cannot fertilize the egg. This includes the use of condoms which are available for both males and females. cervical caps, IUD'S are some examples of barrier method.

ii) Chemical methods involve using chemicals in order to either kill the sperms or making the surroundings inhospitable for them. These mostly contain acids or some salts such as lactic acid, or potassium permanganate. E.g. - Tablets (unwanted 72), jellies, creams and pastes.

**Q. 27. 'DNA copies generated will be similar, but may not be completely identical to the original.' Explain the statement concerning asexually reproducing organisms.**

**Answer:** In asexual reproduction there is involvement of only one parent, hence the offspring receives DNA from a single parent only. Now, this DNA divides or duplicates during the process of replication and cell division. During this division mostly what happens is there is the creation of clones because the similar DNA is being passed on to both daughter cells. However, DNA transferred is not identical because during replication there could be certain environmental factor or any other factors that caused certain changes in the DNA sequences of both.

**Q. 28. Explain tissue culture technique. In which area this technique is finding its application?**

**Answer:** Tissue culture is basically a technique that includes the propagation of plants by culturing cells or tissues.

Plant parts like buds, flowers, anthers, stems, leaves and meristematic tissues possess a property. Due to this property plant cells retain the ability to get developed into any plant part when grown under exact nutritional requirements. Thus various nutrient media are there which contain different compositions of vitamins, minerals, ions etc.

Initially, the culturing of cells led to an undifferentiated mass of callus called as "callus" and then this callus is manipulated under the influence of various factors such as hormones, vitamins, minerals, light, water etc. this callus develops into plantlet which is then transferred to separate pots.

Applications of this technique are,

- By this technique virus or disease-free plants can be generated.
- Various homozygous diploids that are commercially important can be produced by this.
- Plants that cannot produce seed or produce unviable seeds e.g. banana, seedless grapes etc. can be grown by this technique.
- It is widely used for research purposes in order to study plant behavior under variable conditions.
- Original plant lines or pure lines can be preserved by this technique.

**Q. 29. (i) Give the possibilities for a flower to reproduce by self-pollination.**

**(ii) What events take place in a flower after fertilization has taken place?**

**Answer: i)** Self-pollination is the transfer of pollen from the anther of flower to the stigma of the same flower of the same plant or a genetically similar flower. Self-pollination is responsible for producing pure lines and to prevent any kind of genetic recombination. Mostly self-pollinating flowers have certain characteristics, like anthers cover the stigma densely so that when pollen is shed they fall directly on stigma also a group of flowers is clustered together to increase the possibility of self-pollination. Flowers do not need to waste their energy in creating attractive morphologies like order, bright and showy petals for attracting pollinators also self-pollination increases the chances of pollination.

**ii)** Soon as the egg nuclei fuses with male nuclei, and in some cases, after double fertilization is over the flower begins to lose its shine. Petals, stamens, and style either fall or wither away. Calyx may remain persistent in some cases such as Tomato, Brinjal. Major events are,

- The triploid primary endosperm nuclei formed develops into endosperm.
- The zygote develops into an embryo.
- Seeds are formed from ovules.
- Fruit is developed from the ovary

**Q. 30. We hear and read about female feticide, which is really a wrong practice. In some families, be it rural or urban, females are tortured for giving birth to a girl child.**

- (i) Female feticide leads to which major problem in the country?**  
**(ii) In your opinion, the approach of the society towards mother in this regard is correct Not? Explain with a scientific reason.**  
**(iii) What value will the learners infer from this passage?**

**Answer: i)** Female feticide is killing the girl child when it is in the mother's womb. This leads to a major problem of decreased girl population in the country leading to disturbed sex ratio i.e. a number of males per female. The sex ratio lies at around 880 females per 1000 males which is very low and is of a moral concern.

**ii)** Scientifically speaking, sex of the baby cannot be changed or influenced. Genetically male possess 1 copy of X chromosome and 1 copy of Y chromosome while female possess both copies of X chromosomes.

Thus males produce 50% X chromosome sperms and 50% Y chromosome sperms while female bears only X chromosome egg. Now which sperm is going to fertilize the egg is not in anyone's control. Hence, it is worthless to blame women for giving birth to a female child because she cannot control it.

**iii)** From this passage first of all, learner will learn about the problem persisting in our society. Secondly, he/she will get the genetic and scientific knowledge regarding the birth and sex control of baby. Third, a learner will now know that it is worthless to blame anyone especially women for giving birth to a female child and he/she will get awareness regarding this which he/she will pass on.

**Q. 31. You must have seen your mother adding a paste of yeast cells to the idli paste she has prepared. Similarly, the brewing industry uses yeast in the manufacture of alcohol.**

- (i) How does such a small amount of yeast add help to produce thousands of liters of alcohol?**  
**(ii) Explain how yeast multiplies so fast.**  
**(iii) What are they values shown by your mother?**

**Answer: i)** Yeast (*Saccharomyces cerevisiae*) is a eukaryotic fungus. Yeast is a unicellular organism that multiplies asexually by the process of budding which is a very fast process. Yeast converts carbohydrates into carbon-di-oxide and alcohol and due to this property only it is highly exploited in the brewery industry. Yeast doubles its population every 80-90 minute, thus when a small amount of yeast is added it multiplies and increases its population to 1000 folds within 24 hours.

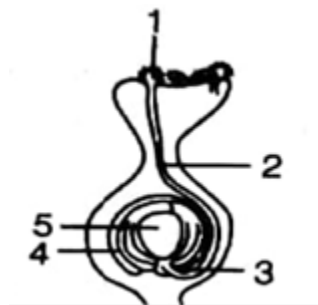
**ii)** Yeast multiplies by the process of budding which is a mode asexual reproduction. From the existing parent cell, a bud arises genetic material duplicates and then get divided into half between the 2 cells. However, newly formed yeast cells mostly do not separate from the parent cell and form long chains of cells.

iii) Mother is the owner of kitchen, and she knows the importance of yeast that means she is aware of yeast's fermentation properties.

This thing shows that science has influenced our household and our eating habits greatly.

## Challengers

**Q. 1. The diagram shows the cross-section through the carpel of a flower just before fertilization.**



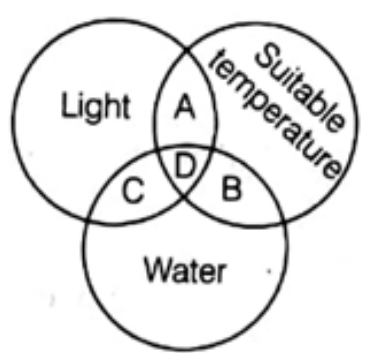
**Where will the male and female gametes be just before fertilization?**

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

- A. (a)
- B. (b)
- C. (c)
- D. (d)

**Answer:** Male gamete travels inside the pollen tube while female gamete is inside the ovule. Pollen tubes penetrate the ovule to release the male nuclei inside it, that why just before fertilization male gamete is at the end of pollen tube while gamete is inside the ovule.

**Q. 2. Which conditions are necessary to activate enzymes when a seed germinates?**



- A. C
- B. A
- C. D
- D. B

**Answer:** When the seed is shed it contains very less moisture content, hence when it receives appropriate temperature before germination, seed first absorbs water which activates the enzyme inside it, now these activated enzymes and hormones start the digestion of food stored in endosperm mostly in the form of starch. Once starch is mobilized, root and shoot start appearing and light is needed when chloroplast is developed in leaves. Because till that time seed has used all its stored food and now it will prepare food using sunlight.

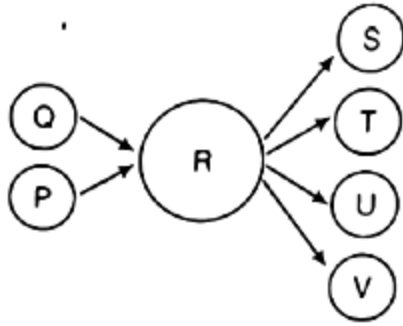
**Q. 3. Given below are certain adaptations in the fruit of certain plants. On the basis of information given below, identify the agent of pollination in both situations.**

- i. small, dry and light seeds with a parachute of fine hair.
- ii. Brightly colored, sweet and juicy but hard seeds.

- A. I-insects, II-animals
- B. I-water, II-insects
- C. I-wind, II-animals
- D. I-birds, II-insects

**Answer:** When seeds are light in weight and contain hairs they can be easily blown away by the wind to a greater distance. Since plants tend to disperse their population to a far extent. While, brightly colored, sweet and juicy fruit contain hard seeds which cannot be dispersed by wind thus it needs human/animals as dispersal agents since we eat the fruits and throw away the seeds.

**Q. 4. The diagram represents gametes P and Q fusing to give cell R. This cell then produces gametes S.T.U and V.**



Which statement about the numbers of chromosomes in the cells and gametes is corrected.

- A. The numbers of chromosomes in P and Q are different.
- B. The numbers of chromosomes in P and Q are the same.
- C. The numbers of chromosomes in S is one-quarter of chromosomes in Q
- D. The numbers of chromosomes in T is half the member of chromosomes in Q

**Answer:** All the cell types have 23 pairs of chromosomes or 46 total.

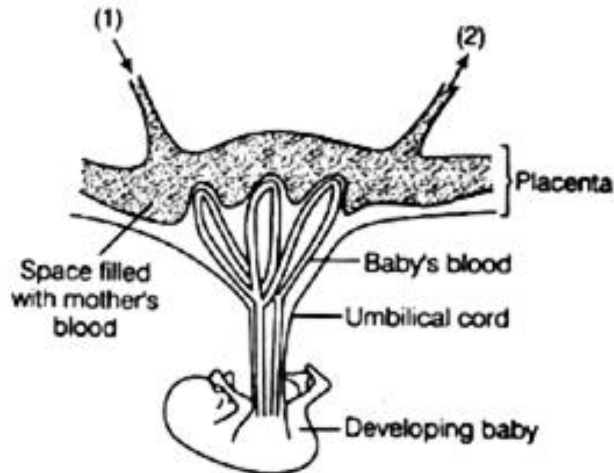
During Meiosis, a cell undergoes two rounds of cell division during which the chromosome pairs are separated and the resulting gametes each have only one copy from each set of chromosomes.

**Q. 5. Among all the methods of contraception, which one can prevent the implantation of the fertilized egg?**

- A. Coil (mechanical)
- B. condom (mechanical)
- C. Spermicide (chemical)
- D. Vasectomy (Surgical)

**Answer:** It is because condoms are a barrier method of protection which doesn't even allow sperms to enter the vagina. On the other hand, spermicides kill the sperms as soon as they enter vagina hence prevent fertilization. Vasectomy is a surgical method that cuts vasa deferentia thus doesn't even allow the sperms to get ejaculated in the urethra. Thus, only coil mechanism prevent implantation.

**Q. 6. The diagram shows the arrangement of blood vessels in the uterus wall and placenta of pregnant women.**

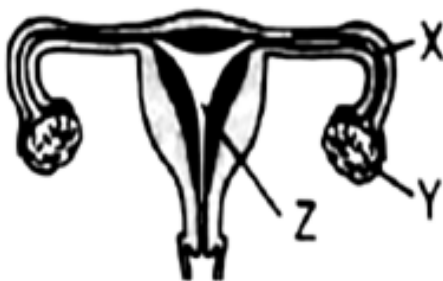


Which of the following will increase in concentration in the blood as it flows from 1 and 2?

- A. Amino acids
- B. Carbon dioxide
- C. Glucose
- D. oxygen

**Answer:** Placenta functions as a carrier of nutrients from mother to baby. Thus all of amino acids, glucose, and oxygen will decrease in the concentration at 2 since all of them are transferred to the baby at 1 because it has a low concentration of all. However, due to metabolic processes and lack of excretory mechanism baby's blood has a high concentration of carbon dioxide, which will be transferred to mother's blood because her blood has low CO<sub>2</sub> concentration. Thus at 2 blood is coming at high CO<sub>2</sub> concentration.

**Q. 7. 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

- A. (a)
- B. (b)
- C. (c)
- D. (d)

**Answer:** This is because mitosis begins just after fertilization i.e. after formation of zygote. So mitosis is occurring at X and Z location but at Y the only ova are being prepared thus no mitosis while meiosis (reduction division) is there.

### Check Point 05

**Q. 1. Define the reproductive health.**

**Answer:** Reproductive health can be defined as the state of physical, mental and social fitness to lead a healthy reproductive life.

**Q. 2. Give a reason for the declining balance in sex ratio.**

**Answer:** The major reason for the decline in balance of sex ratio is due to reckless female foeticide, sex ratio is declining rapidly in some section of our society.

**Q. 3. Why expanding population is a matter of concern.**

**Answer:** Expanding population is a matter of major concern because an expanding population makes it difficult to improve the standard of living.

**Q. 4. Which is the most commonly used method of birth control.**

**Answer:** The commonly use method for birth control is barrier method in which a barrier is created which does not allow sperm to fertilise egg in the women in uterus.

The various method include in Barrier method are:

1. Condom: Rubber sheath is worn over the penis to stop sperm entering the vagina.

2. Diaphragm: Rubber cup that is placed in the vagina over cervix.

3. Intra-Uterine Contraceptive Device (IUCD): Copper-T is placed in uterus by doctor which prevent pregnancy.

**Q. 5. Name a method which acts as birth control and also protects from STDs.**

**Answer:** The barriers method is acts as birth control and also protects from STDs.

**Q. 6. In what ways, oral contraceptive measure help in birth control.**

**Answer:** Oral contraceptive is an example of hormonal contraceptive method in which oral medicines containing hormones, which prevent releases of ovum, so that the fertilization cannot occur. These disturb the hormonal balance of the body.

**Q. 7. Name two STDs caused by bacteria.**

**Answer:** Two STDs caused by bacteria are:

**1. Gonorrhoea:** it is caused by Neisseria gonorrhoeae.

**Symptoms:**

- a. Discharge of pus from penis and vagina
- b. Burning sensation on urinating

**2. Syphilis:** It is caused by bacteria Treponema pallidum.

**Symptoms of syphilis:**

- a. Appearance of sore on body parts
- b. Fever, ulcer, bone pain, liver disease and anaemia.