

## Very Short Answer Type Questions

[1 Mark]

**Q. 1. What is the effect of DNA copying which is not perfectly accurate in the reproduction process?**

**Ans.** The DNA copying which is not perfectly accurate in the reproduction process results in variation in populations for better survival of the species.

**Q. 2. What methods will you use for growing jasmine and rose plants?**

**Ans.** For growing jasmine plants, layering method will be used and for growing rose plants, cutting and grafting methods will be used.

**Q.3. Name the part of Bryophyllum where the buds are produced for vegetative propagation.**

**Ans.** In Bryophyllum, the buds are produced in leaf notches.

**Q. 4. Which parts of plants can grow vegetatively?**

**Ans.** Modified stems like onion bulbs, runners of doob grass, ginger rhizomes, potato tubers, root tubers of sweet potato and dahlia, stem cutting of plants like rose and leaves of plants like Bryophyllum can be grown vegetatively.

**Q. 5. can you consider cell division as a type of reproduction in unicellular organism? Give one reason.**

**Ans.** Yes, because it results in the formation of two daughter cells, i.e. It results in the production of more individuals of the organism

**Q. 6. What is the function of pollen grains in flowers?**

**Ans.** Pollen grains are the male gametes which fertilise the egg cell present in the ovule.

**Q. 7. Write the various methods of cross-pollination.**

**Ans.** Various methods of cross-pollination are **entomophily** (insect pollination), **anemophily** (wind pollination), **hydrophily** (water pollination) and **zoophily** (animal pollination).

**Q. 8. Why cannot fertilisation take place in flowers if pollination does not occur?**

Or

**Why is fertilisation not possible without pollination?**

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

**Q. 9. Explain the role of cotyledon and plumule in germination.**

**Ans.** Cotyledon stores food and the plumule acts as future shoot.

**Q. 10. Is the chromosome number of zygote, embryonal cells and adult of a particular organism always constant? How is the constancy maintained in these three stages?**

**Ans.** Yes, the constancy is maintained because cells in all these three structures undergo only mitotic divisions.

**Q. 11. In a bisexual flower inspite of the young stamens being removed artificially, the flower produces fruit. How is it possible?**

**Ans.** This is because the pistil is intact due to which cross-pollination takes place leading to fertilisation and formation of fruit.

**Q. 12. Can you consider cell division as a type of reproduction in unicellular organism? Give one reason.**

**Ans.** Yes, because it results in the formation of two daughter cells, i.e., it results in the production of more individuals of the organism.

**Q. 13. What is gametogenesis?**

**Ans.** Formation of sperms in testes and ova in ovary is called gametogenesis.

**Q. 14. In tobacco plant, the male gametes have twenty four chromosomes. What is the number of chromosomes in the female gamete? What is the number of chromosomes in the zygote?**

**Ans.** Number of chromosomes in female gamete is 24 and in zygote it is 48.

**Q. 15. How is the sperm genetically different from the egg?**

**Ans.** Sperms contain either X or Y chromosome whereas an egg will always have an X chromosome.

**Q. 16. What would be the ratio of chromosome number between an egg and its zygote? How is the sperm genetically different from the egg?**

**Ans.** The ratio is 1: 2 Sperms contain either X or Y chromosome whereas an egg will always have an X chromosome.

**Q. 17. List two functions performed by the testis in human beings.**

**Ans.** Functions of testis:

- (i) To produce sperms.
- (ii) To produce male sex hormone/testosterone.

**Q. 18. List two functions of ovary of human female reproductive system.**

**Ans.** (i) To produce female gamete.

(ii) To secrete female hormones.

**Q. 19. Name the life process of an organism that helps in the growth of its population.**

**Ans.** Reproduction helps in the growth of the population.

**Q. 20. What happens when a mature Spirogyra filament attains considerable length?**

**Ans.** When a mature Spirogyra filament attains considerable length its filament breaks up into smaller fragments and each fragment grows into a new filament or individual.

**Q. 21. Name two simple organisms having the ability of regeneration.**

**Ans.** *Planaria*/*Hydra*/Earthworm. (Any two)

**Q. 22. What happens when a Planaria gets cut into two pieces?**

**Ans.** Each piece regenerates into a new Planaria.

**Q. 23. Name the method by which Hydra reproduces. Is this method sexual or asexual?**

**Ans.** Hydra reproduces by budding or regeneration.

It is a method of asexual reproduction.

**Q. 24. Name the male and female gametes in animals.**

**Ans.** Male gametes are called sperms while female gametes are called eggs or ova.

**Q. 25. Why are testes placed outside the abdominal cavity in the scrotal sac?**

**Ans.** Testes are placed outside the body cavity in the scrotal sac because it requires a temperature 2°C lower than the normal body temperature for production of sperms.

**Q. 26. What is hymen?**

**Ans.** It is a thin fold of mucous membrane which partly closes the external vaginal opening in the unmarried girls.

**Q. 27. What is funeral of unfertilised egg?**

**Ans.** Menstruation is also called funeral of egg since it is not fertilised.

**Q. 28. What is gestation?**

**Ans.** The period of development of foetus in the uterus till birth is called gestation. It is of 9 months duration (i.e., 280 days or 40 weeks from the first day of the last menstrual cycle) in human beings.

**Q. 29. Define parturition.**

**Ans.** The birth of the fully developed foetus (childbirth) is called parturition

**Q. 30. Name the causative agent of the disease "Kala-azar" and its mode of asexual reproduction.**

**Ans.** The causative agent is Leishmania and the mode of asexual reproduction is binary fission.

**Q. 31. Name the parts of a bisexual flower that are not directly involved in reproduction.**

**Ans. (i)** Sepals/calyx

**(ii)** Petals/Corolla

**(iii)** Thalamus

**Q. 32. List two unisexual flowers.**

**Ans.** Water melon and papaya are unisexual flowers.

**Q. 33. What is DNA?**

**Ans.** DNA is the carrier of hereditary information from parents to the next generation.

**Q. 34. Write names of one male and one female sex hormone.**

**Ans.** Male sex hormone is testosterone and female sex hormone is oestrogen.

**Q. 35. Write whether true (T) or false (F) :**

**(i) Duration of menstrual cycle in human female is 20 days.**

**(ii) Onset of menstruation is termed menopause**

**(ii) In human beings, male attains puberty little later than females.**

**Ans.** (i) F, (ii) F, (iii) T

**Q. 36. What is syngamy?**

**Ans.** One male nucleus fuses with one female gamete or egg. This process of fusion of male and female nuclei is called syngamy.

**Q. 37. What are those organisms called which bear both the sex organs in the same individual. Give one example of such organism.**

**Ans.** Organisms bearing both the sex organs in the same individual are called bisexual. Example, Hydra, Mustard.

**Q. 38. Give an example of a unisexual and bisexual flower.**

**Ans.** Cucumber is a unisexual flower and hibiscus is a bisexual flower.

**Q.39. Where is the zygote located in the flower after fertilisation?**

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

**Q. 40. Where do the following functions occur?**

**(i) Production of an egg      (ii) Fertilisation**

**(iii) Implantation of zygote.**

**Ans.** (i) In ovary

(ii) In fallopian tube

(iii) In uterus (uterine wall).

**Q. 41. Give reason for the statement- Since the ovary releases one egg every month, the uterus also prepares itself every month by making its lining thick and spongy.**

**Ans.** The lining of uterus becomes thick for nourishing the embryo if fertilisation takes place and egg reaches the uterus.

**Q. 42. What is menopause?**

**Ans.** The period of permanent cessation of menstruation in females, usually occurring between the age of 45 and 50.

## Short Answer Type Questions – I

[2 Marks]

**Q. 1. Reproduction is essentially a phenomenon that is not for survival of an individual but for continuation of a species. Justify.**

**Ans.** For survival, an individual needs energy which it obtains from life processes such as nutrition and respiration. Reproduction does not provide energy for survival. Instead, reproduction ensures transfer of genetic material from one generation to the next which helps in continuation of species. Hence, it is an important phenomenon for maintaining continuity of species.

**Q. 2. Define the terms unisexual and bisexual giving one example of each.**

**Ans.** Unisexual: In most of the animals including humans, male and female reproductive organs are in different individuals. Such animals are called unisexual.

Bisexual: In some animals like tapeworm, liver fluke, earthworm, leech, etc., the male and female reproductive organs are found in a single individual. Such organisms are called bisexual (hermaphrodite).

The flower may be unisexual (e.g., papaya, watermelon) when it contains either stamens or carpels and bisexual (e.g., Hibiscus, mustard) when it contains both stamens and carpels.

**Q. 3. What is a clone? Why do offsprings formed by sexual reproduction exhibit remarkable similarity?**

**Ans.** Clone refers to offspring of an organism formed by asexual method of reproduction. Since they possess exact copies of the DNA of their parent, clones exhibit remarkable similarity.

**Q. 4. Why cannot fertilisation take place in flowers if pollination does not occur?**

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

**Q. 5. Why does bread mould grow profusely on a moist slice of bread rather than on a dry slice of bread?**

**Ans.** Moisture is an important factor for the growth of hyphae. Moistened bread slice offers both moisture and nutrients to the bread mould, hence it grows profusely, Dry slice of bread offers nutrients but not moisture hence hyphae fail to grow.

**Q. 6. Explain the roles of gametes and zygote in sexual reproduction.**

**Ans.** The two fusing gametes possess characters of their parents in their DNA. Fertilisation brings characters of both parents into one zygote cell.

Zygote is the first cell of the next generation. It divides to form an embryo which subsequently grows into a new individual.

Male gamete forming part - anther/stamen

Female gamete forming part - pistil/ovary/ovule

**Q. 7. Describe the structure of a pollen grain.**

**Ans.** Stamens produce pollen grains that are yellowish in colour. Pollen grain is unicellular and haploid. It has two layers, the thicker outer one is called exine, which is thin at places called germ pores and inner thin layer is called intine.

**Q. 8 In a germinating seed, which parts are known as future shoot and future root? Mention the function of cotyledon.**

**Ans.** In a germinating seed, plumule is known as future shoot and radicle is known as future root. The function of cotyledon is to store food for the future plant or embryo.

**Q. 9. Identify the following parts of a flower:**

**(i) Part that produces pollen grain. (ii) Part that transfers male gametes.**

**(iii) Part that is sticky to trap. (iv) Part that develops into a fruit.**

**Ans.** (i) Anther (ii) Style (iii) Stigma (iv) Ovary

**Q. 10. What is puberty?**

**Ans.** The period of adolescence when the reproductive organs become functional, is termed as puberty. It is accompanied by development of secondary sexual characters both in males and females.

**Q. 11. Differentiate between self-pollination and cross-pollination**

**Ans.**

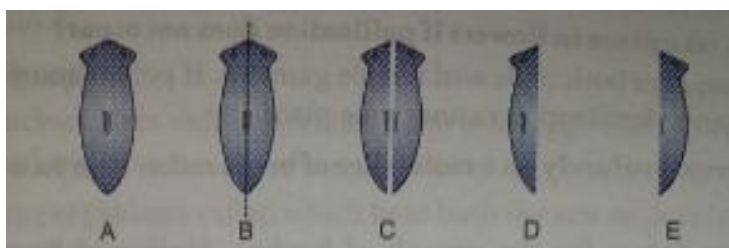
<b>Self-Pollination</b>	<b>Cross-Pollination</b>
1. Transfer of pollen grains from anthers to the stigma of the same flower or another flower of the same plant. 2. It occurs in bisexual flower, e.g., wheat, rice, potato, pea, etc.	1. Transfer of pollen grains from anthers of a flower to the stigma of another flower borne on another plant of the same species. 2. It occurs in unisexual as well as in bisexual flower, e.g., maize

**Q. 12. Give two reasons for the appearance of variations among the progeny formed by sexual reproduction.**

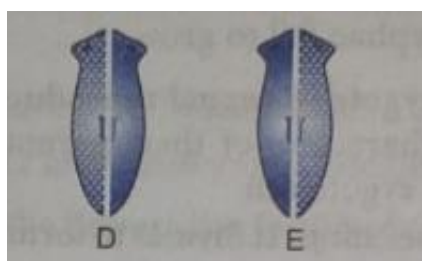
**Ans. (a)** Sexual reproduction involves two parents with different sets of characters.

**(b)** The gene combinations are different in gametes.

**Q. 13. Would a Planaria cut vertically into two halves regenerate into two individuals? Complete Figure D and E by indicating the regenerated regions.**



**Ans.** Yes, shaded part in Figures D and E represent the regenerated halves.



**Q.14. What are the benefits of using mechanical barriers during sexual act?**

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

**Q. 15. 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? Justify your answer.**

**Ans.** Asexual reproduction does not involve genetic fusion while sexual reproduction involves fusion of male and female gametes to form a zygote.

Species reproducing sexually have better chances of survival. This is because sexual reproduction gives rise to more variations which are essential for evolution as well as survival of species under unfavorable conditions.

**Q.16. Why is DNA copying an essential part of the process of reproduction? What are the advantages of sexual reproduction over asexual reproduction?**



**Ans.** DNA copying is essential because it makes the transmission of characters from parents to the next generation possible.

**Advantages of sexual reproduction over asexual reproduction:** sexual reproduction gives rise to variations, which are essential for evolution as well as for survival of species under unfavorable conditions.

**Q. 17. Trace the path of sperm during ejaculation and mention the gland and their functions associated with the male reproductive system.**

**Ans.** Sperm comes out from testis into the vas deferens and then passes through urethra before ejaculation. The secretions of seminal vesicle and prostate glands provide nutrition to the sperms and also facilitate their transport.

**Q. 18. Give two reasons for avoiding frequent pregnancies by women.**

**Ans.** Frequent pregnancies by women are avoided due to the following reasons

- (i) It has adverse effect on the health of women
- (ii) It increases the rate of the population of our country.

## Short Answer Type Questions – II

[3 marks]

**Q. 1. Suggest three contraceptive methods to control the size of human population which is essential for the health and prosperity of a country. State the basic principle involved in each.**

**Ans.** The methods of contraception are:

**(i) Barrier method or mechanical method (Condom/Diaphragm):** Prevents the meeting of sperms and ova.

**(ii) Chemical method (Oral pills):** Changes the hormonal balance of the female partner so that the eggs are not released.

**(iii) Surgical method:** The vas deferens in males is blocked (vasectomy) or the fallopian tube (oviduct) in females (tubectomy) is blocked to prevent the transfer of sperms or egg and hence no fertilisation takes place.

**(iv) IUCDs/ Loop or the copper-T** is placed in the uterus to prevent pregnancy.

**Q. 2. List four points of significance of reproductive health in a society. Name any two areas related to reproductive health which have improved over the past 50 years in our country.**

**Ans.** Significance of reproductive health in a society:

**(a)** It prevents the spread of various sexually transmitted diseases such as AIDS, syphilis, etc.

**(b)** Individuals with sound reproductive health produce better offspring which have better chances of survival.

**(c)** Better sex education and awareness helps to maintain the population and prevent population explosion.

**(d)** Unwanted and teen pregnancies can be avoided.

The reproductive health in India has improved tremendously over the past 50 years. The areas in which reproductive health have improved are:

**(a)** Family planning                      **(b)** Mortality rate

**Q. 3. List four categories of contraceptive methods. State in brief two advantages of adopting such preventive methods.**

**Ans. The categories of contraceptive methods are:**

- (i) Barrier method (Condoms)
- (ii) Surgical method
- (iii) Withdrawal method
- (iv) Calendar method
- (v) Hormonal method
- (vi) IUCD/Copper T/Loop

**Two advantages of adopting preventive methods are:**

- (i) Helps in maintaining health of women.
- (ii) Helps in preventing STDs especially AIDS.
- (iii) Helps in birth control.
- (iv) Parents can give more attention to children.

**Q. 4. Name the reproductive parts of an angiosperm. Where are these parts located? Explain in brief the structure of its female reproductive parts.**

**Ans. (a)** Each piece regenerates into a new Planaria.

**(b)** Its filaments break into smaller pieces or fragments and each fragment gives rise to a new filament.

**(c)** It releases spores which germinate into new mycelium in moist conditions.

**Q. 5. (a) Name the following:**

**(i) Thread like non-reproductive structures present in Rhizopus.**

**(ii) 'Blobs' that develop at the tips of the non-reproductive threads in Rhizopus.**

**(b) Explain how these structures protect themselves and what is the function of the structures released from the 'blobs' in Rhizopus.**

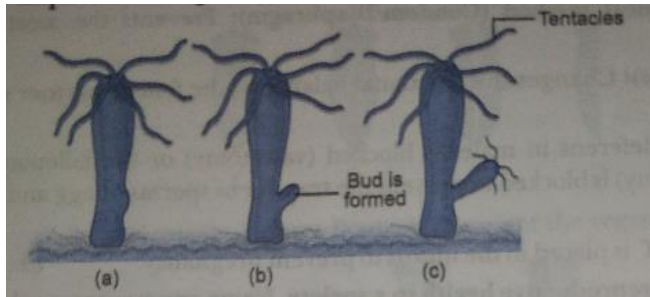
**Ans. (a)** (i) Hyphae/mycelium, (i) Sporangia

**(b)** These structures are protected by thick walls.

These structures germinate into new individuals under favourable conditions.

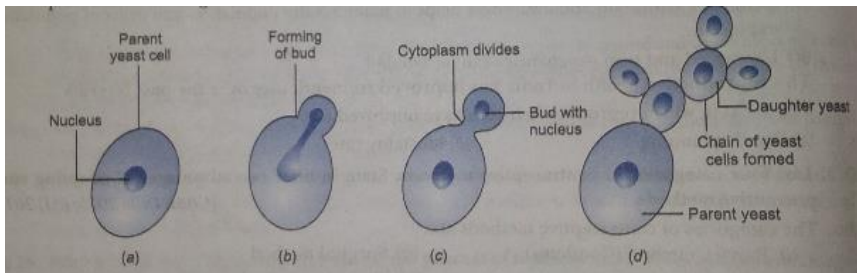
**Q. 6. Explain budding in Hydra with the help of labelled diagrams only**

**Ans.**



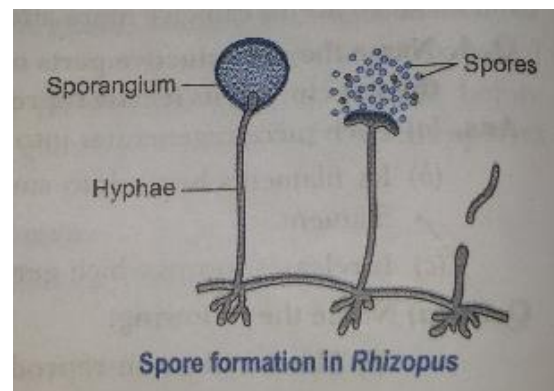
**Q. 7. Explain various steps of budding in yeast.**

**Ans.** Yeast is a unicellular organism. Budding usually occurs when food is available in plenty. In budding, one or more outgrowths appear on one side, which enlarges in size. The nucleus divides mitotically, one daughter nucleus passes into the bud and the other remains in the parent cell. The bud either separates off from the parent cell or new bud appears before its separation from the parent cell resulting in the formation of branched or unbranched chain of buds.



**Q.8. Explain the process of regeneration in Planaria. How is this process different from reproduction?**

**Ans.** When Planaria is cut into many pieces, each piece grows into a complete organism. This regeneration process is carried out by specialised cells, which proliferate, develop and differentiate into various cell types and tissues. Regeneration is not same as reproduction as most of the organisms would not normally depend on being cut up to be able to reproduce.



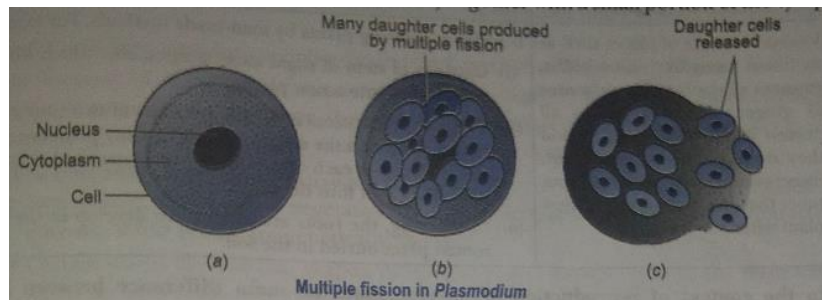
**Q.9. Illustrate the following with the help of suitable diagrams:**

**(i) Spore formation in Rhizopus**

**(ii) Multiple fission in Plasmodium.**

**Ans. (i) Spore formation in Rhizopus:** This is an asexual method of reproduction in bacteria and fungi. Spores are unicellular bodies formed by cell division in a parent organism. After detaching from the parent, and if conditions are suitable, they germinate directly or indirectly into a new individual.

**(ii) Multiple fission in Plasmodium:** It is an asexual mode of reproduction in organisms. Here, the nucleus of the organism divides repeatedly to form a number of equal sized daughter nuclei and each daughter nuclei breaks away together with a small portion of the cytoplasm.



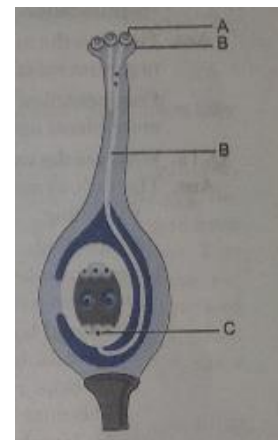
**Q. 10. (a) List two reasons for the appearance of variations among the progeny formed by sexual reproduction.**

**(b) (i) Name the part marked 'A' in the diagram alongside.**

**(ii) How does 'A' reaches part 'B'?**

**(iii) State the importance of the part 'C'.**

**(iv) What happens to the part marked 'D' after fertilisation is over?**



**Ans. (a)** Variation is seen among progeny formed by sexual reproduction because of:

**(i)** Involvement of two different individuals.

**(ii)** Creation of new combination of variants.

**(b) (i)** A-pollen or pollen grain.

**(ii)** It reaches the stigma (B) by agents of pollination.

**(iii)** C (pollen tube) helps male gamete to reach the egg (ovule).

**(iv)** After fertilisation it converts into embryo.

**Q. 11. How does natural vegetative propagation occur?**

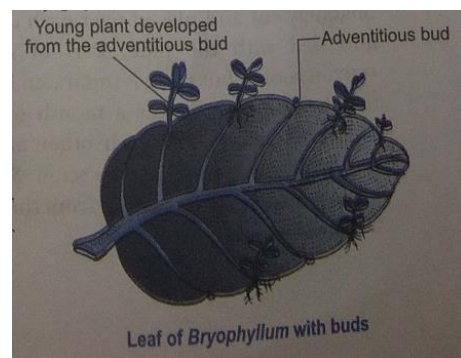
**Ans.** Natural vegetative propagation occurs from modified stems, roots, leaves and bulbs. Modified short stems, onion bear **bulbs** which when grown in soil develop into a new plant.

**Runners** -stems of doob grass have nodes and internodes. From nodes, roots are developed that formed a new plant.

**Rhizome** of ginger is a horizontal underground stem. If kept in soil with adequate moisture it develops into a new plant.

**Tuber** of potato bears eyes (buds), which if sown (entire or in pieces) in soil develops into a new plant.

Modified root **tubers** of sweet potato also grow into a new plant. Buds produced in the notches along the leaf margin of Bryophyllum fall on the soil and develop into new plants.



**Q. 12. Illustrate the following with help of suitable diagram:**

**Leaf of Bryophyllum with buds**

**Ans.** Leaf of Bryophyllum shows vegetative propagation in plants where a part of the body becomes detached and develops into a new supporting plant. Here, leaves of Bryophyllum pinnatum having plantlets along the leaf margins when grown in soil develops into a new plant.

**Q. 13. Differentiate between natural and artificial vegetative propagation in plants.**

**Ans.**

Artificial Propagation	Natural Propagation
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<p>Vegetative parts of plants such as modified stems like onion <b>bulbs</b>, <b>runners</b> of doob grass, <b>rhizomes</b> of ginger, <b>tuber</b> of potato all possess buds. When sown in soil they develop into a new plant. Sweet potato (shakarkandi) is a root tuber that also develops into a new plant when sown in soil.</p>	<p>It includes growing plants by man-made methods. For example,          (i) <b>Cuttings</b> of stem of sugar cane, grapes, etc., which when grown in soil develop into a new plant.          (ii) <b>Grafting</b> is a process in which branches of two similar plants, one potted plant and the other of a good quality plant are obliquely cut and placed over each other and tied by a tape and left for a month or so. A new plant thus develops.          (iii) In <b>layering</b>, the roots are induced to develop in the branch of a rooted plant buried in the soil.</p>
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**Q. 14. In the context of reproduction of species state the main difference between fission and fragmentation. Also give one example of each.**

**Ans.** Fission is the method of asexual reproduction in unicellular forms of life. In this process the parent organism splits to form two or more daughter cells. Example, Ameoba and Plasmodium  
 Fragmentation is the process found in multicellular organisms. The filament breaks up into two or more pieces upon maturation. These pieces then grow into new individuals. Example, Spirogyra.

**Q.15. What are the various methods of vegetative propagation? Discuss any one method with example.**

**Ans.** The various methods of vegetative propagation are:

- (i) cutting,                      (ii) layering,
- (iii) grafting,                      (iv) tissue culture.

**Layering:** In layering, roots are induced on the stem of a rooted plant. When roots develop, that part of stem is detached from the parent plant and grown in the soil. Layering is of two types:

**(i) Mound layering:** A lower branch of a rooted plant is bent and buried into the moist soil. The tip of the branch should remain above the ground. In a few days, the buried part of the branch develops roots. It is now cut off from the parent plant and grown in the soil as a new plant.

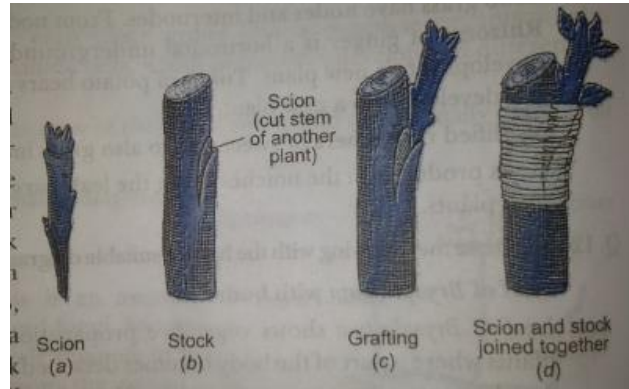
This method is used in the propagation of grapevine, strawberry, raspberry, jasmine etc.

**(ii) Air layering:** This method is used in plants like crotons whose branches cannot be bent and buried in the soil. The stem is girdled, i.e., a ring of bark is removed and then it is covered with a

moist moss or cotton and enclosed in a polythene bag. After a few days, roots emerge from this region and branch is cut off from the parent plant. It can now be planted in the soil as a new plant. This method is used in rose, rubber plant, guavas, pear, apple, mangoes, etc.

**Q. 16. State the process of grafting.**

**Ans.** In grafting, stem parts of two different plants are joined to produce a new plant. One part is of in situ rooted plant called stock and another part from superior quality plant called scion. Both are obliquely cut and placed over each other and tied with the tape. Part of stock remains rooted but scion is separated from the mother plant. After a month or so, both parts unite with each other and a new plant develops from the scion. Stock provides water and minerals from to the developing plant.



**Q. 17. Explain the term 'Regeneration' as used in relation to reproduction of organisms. Describe briefly how regeneration is carried out in multicellular organisms like Hydra.**

**Ans.** Regeneration is the ability of an organism to give rise to a new organism or individual from their body parts.

Each part of Hydra contains specialised cells which have the ability to proliferate. When the body of Hydra by any means is cut into number of pieces, these pieces proliferate and make large number of cells. From this mass of cells different cells undergo changes to become various cell types and tissues finally developing into a new organism.

**Q. 18. Explain four advantages of vegetative propagation.**

**Ans. (i)** New plants produced by vegetative propagation maintain the desirable characters of the parents. These plants are genetically identical.

**(ii)** Certain plants like banana, grapes, pineapple, roses, jasmine, etc., do not form seeds. Thus, this is the only method of reproduction and continuation of such species.

**(iii)** This method is cheap and can be easily employed to reproduce plants, especially fruit plants.

**(iv)** Only one parent is required for reproduction.

**Q. 19. Describe double fertilisation in plants.**

**Ans.** Soon after pollination the pollen grains start germinating and form a pollen tube. The pollen tube grows within the style till it reaches the ovary.



On reaching the ovary it enters the ovule through an opening called micropyle. In the meantime, two male gametes are formed in the pollen tube. One of the male gametes fuses with the egg, the process is called syngamy. The product formed is termed as zygote. The other male gamete fuses with the two polar nuclei, one from each end of embryo sac, to form endosperm nucleus. This process is called triple fusion. In this process three nuclei, two polar nuclei and one male gamete is involved, so it is called triple fusion. Thus, inside each embryo sac two fusions, i.e., syngamy and triple fusion take place. This mechanism of two fusions occurring in an embryonal sac is called double fertilisation. After fertilisation, the ovule develops into seed and the ovary develops into a fruit.

**Q. 20. What is sexual reproduction? List its two significances.**

**Ans.** Two major processes namely formation of gametes and fusion of gametes constitute sexual reproduction. **its significances are:**

- (i) Incorporates the process of combining DNA from two different individuals during reproduction.
- (ii) Increases genetic variation.
- (iii) Promotes diversity in the offsprings.
- (iv) Plays a role in the origin of new species.

**Q. 21. Mention secondary sexual characters in human male and female.**

**Ans. Secondary sexual characters**

**Male:**

1. Hair growth on face, chest, armpit (axillae) and over pubis.
2. Voice becomes deep and hoarse due to growth of larynx called Adam's apple.
3. Body becomes muscular.

**Female:**

1. Growth of breasts and hair in axillae and over pubis
2. Pelvis region becomes broad and buttocks become heavy due to deposition of fat.
3. Development of accessory sex organs.

**Q. 22. (a) Mention the role of the following organs of human male reproductive system:**

**(i) Testis; (ii) Scrotum; (iii) Vas deferens; (iv) Prostate glands.**

**(b) What are the two roles of testosterone?**

**Ans. (i) Testis:** to produce male gametes.

**(ii) Scrotum:** to provide optimal temperature to testis for the formation of sperms.

**(iii) Vas deferens:** to deliver the sperms to the urinary bladder.

**(iv) Prostrate glands:** to secrete the fluid which provides nutrition and medium for transport of sperms.

**(b) Testosterone has following roles:**

**(i)** regulates formation of sperms.

**(ii)** brings about the changes in boys during adolescence.

**Q. 23. Explain how, offspring and parents of organisms reproducing sexually have the same number of chromosomes.**

**Or**

**How do organisms, whether reproduced asexually or sexually maintain a constant chromosome number through several generations? Explain with the help of suitable example.**

**Ans.** During asexual reproduction organisms undergo only mitotic divisions. The DNA (in the chromosomes) of the cells involved are copied and then equally divided among the two daughter cells formed. Thus, chromosome number remains unchanged.

In sexual reproduction, organisms produce gametes through meiosis, which is called reductional division, in which the original number of chromosomes becomes half. These two gametes combine to form the zygote and the original number of chromosomes is restored.

For example, in humans, the parents (father and mother) each have 46 or 23 pairs of chromosomes. In the gametes, the sperm has half the number of chromosomes, i.e., 23 and the egg also has 23 chromosomes. When the sperm and the egg fuse, the zygote has 46 or 23 pairs of chromosome. Thus, the chromosome number remains constant.

**Q. 24. What are the male and female gonads in human beings? Mention their functions.**

**Ans.** The male gonads in human beings are a pair of testes. The testis lies in a sac outside the abdominal cavity called scrotum. The function of testis is to regulate the production of sperms and secretion of male hormone, testosterone. The female gonads in human beings are pair of ovaries located in the abdominal cavity near the kidneys.

**The ovaries perform dual functions of:**

(i) production of female hormones oestrogen and progesterone.

(ii) production of female gamete ovum/ova.

**Q. 25. From the internet, gather information about the chromosome numbers of five animals and five plants. Correlate the number with the size of organism and answer the following questions.**

**(a) Do larger organisms have more number of chromosomes/cells?**

**(b) Can organism with fewer chromosomes reproduce more easily than organisms with more number of chromosomes?**

**(c) More the number of chromosomes/cells greater is the DNA content. Justify.**

**Ans. (a)** No, there is no relationship between size of organism and its chromosome number.

**(b)** No, process of reproduction follows a common pattern and is not dependent on the number of chromosomes.

**(c)** Yes, since the major component of chromosome is DNA, if there are more chromosome in a cell, the quantity of DNA will also be more.

**Q. 26. What happens when**

**(a) Planaria gets cut into two pieces?**

**(b) A mature Spirogyra filament attains considerable length?**

**(c) On maturation sporangia burst?**

**Ans. (a)** Each piece regenerates into a new Planaria.

**(b)** Its filaments break into smaller pieces or fragments and each fragment gives rise to a new filament.

**(c)** It releases spores which germinate into new mycelium in moist conditions.

**Q. 27. Mention the information source for making proteins in the cell. What is the basic event in reproduction?**

**Ans.** The DNA in the nucleus of a cell is the information source for making proteins. If the information is changed, different proteins will be made. The basic event in reproduction is the creation of a DNA copy. Cells use chemical reactions to build copies of their DNA. This creates two copies of the DNA in a reproducing cell and they need to get separated from each other. DNA copying is accompanied by the creation of an additional cellular apparatus, and then the DNA copies separate, each with its own cellular apparatus.

**Q. 28. (a) Write the names of those parts of a flower which serve the same function as the following do in the animals.**

- (i) testis, (ii) sperm  
 (iii) ovary, (iv) egg

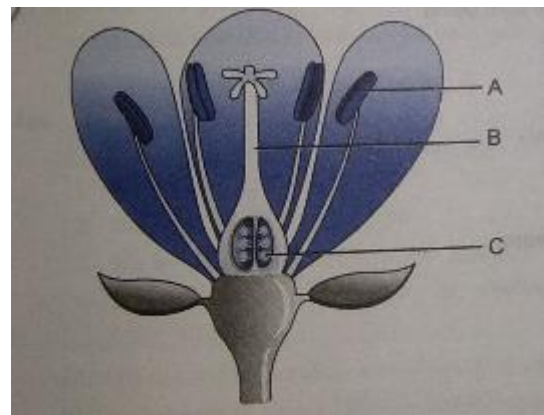
(b) State the function of flowers in the flowering plants.

Ans. (a) (i) testis – anther (ii) sperm – pollen grains

(iii) ovary – ovary (iv) egg – ovum

(b) Flowers are responsible for sexual reproduction as they contain the reproductive organs of the plant.

Q. 29. Name the parts A, B and C shown in the following diagram and state one function of each.



Ans.

	Part	Function
A	Anther	It produced pollen grains.
B	Style	It provides the path through which the pollen tube grows and reaches the ovary.
C	Ovary	It contains ovules and each ovule has an egg cell. It develops into fruit after fertilisation.

Q. 30. What are sexually transmitted diseases? List two examples of each disease caused due to (i) bacterial infection and (ii) viral infection. Which device or devices may be used to prevent the spread of such diseases?

Ans. Diseases which are transmitted from an infected person to a healthy person due to unsafe sex are called sexually transmitted diseases.

Two examples:

**Bacterial disease:** Gonorrhoea and syphilis

**Viral disease:** Warts and AIDS

**Preventive measures:** Use of condoms or similar coverings.

**Q. 31. (i) Name any two sexually transmitted diseases (STDs). How do these infectious diseases spread from one person to another? Give two symptoms of STDs.**

**(ii) Explain why fertilisation is possible if copulation takes place during the middle of menstrual cycle.**

**Ans. (i)** The two sexually transmitted diseases (STDs) are gonorrhoea and syphilis. These infectious diseases spread from one person to another by sexual contact with an infected person. Two symptoms of STDs are burning sensation at urination and urethral discharge and sores in the genitals.

**(ii)** Since ovulation, i.e., the release of ovum occurs on the 14th day of the menstrual cycle, i.e., in its middle, chances are more for the sperms to fertilise the egg or ovum during this time.

**Q. 32. Write the full form of IUCD, AIDS, HIV, OC.**

**Ans.** IUCD = Intra-Uterine Contraceptive Device

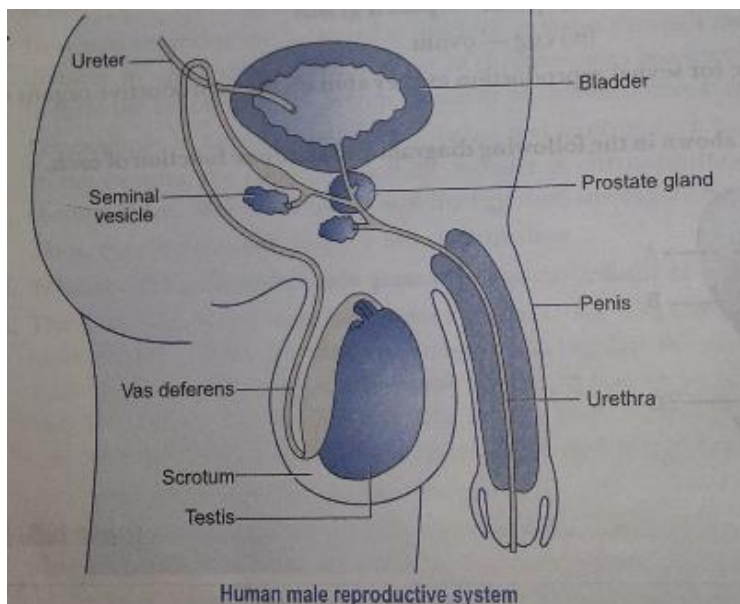
HIV = Human Immunodeficiency Virus

AIDS = Acquired Immune Deficiency Syndrome

OC = Oral Contraceptive

**Q. 33. Draw a labelled diagram of a human male reproductive system**

**Ans.**



**Q. 34. What is placenta? Mention its role during pregnancy.**

**OR**

**What is placenta? Explain its function in humans.**

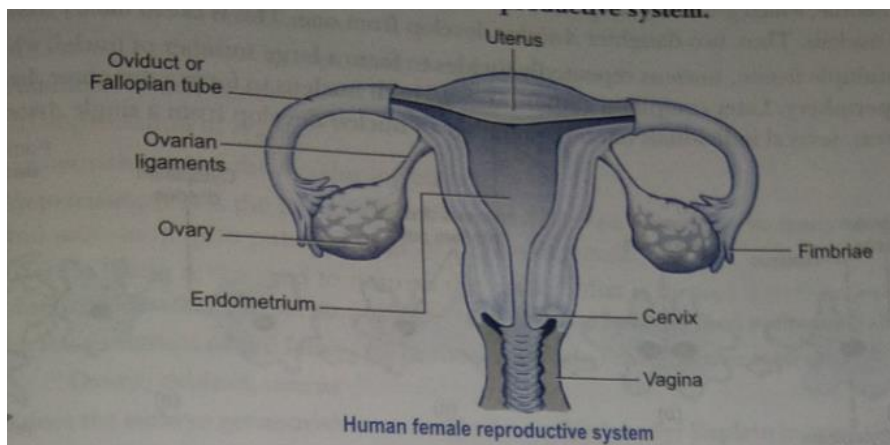
**Ans.** Placenta is a special tissue connection between embryo and uterine wall. It acts as an endocrine gland.

**Role of placenta:**

- (i) It possesses villi that increase the surface area for absorption of nutrients.
- (ii) Facilitates passage of nutrition and oxygen to embryo from mother through blood.
- (iii) Waste substances produced by embryo are removed through placenta into mother's blood.

**Q. 35. Draw a labelled diagram of a human female reproductive system.**

**Ans.**



**Q. 36. What are the functions of testis in the human male reproductive system? Why are these located outside the abdominal cavity? Who is responsible for bringing about changes in appearance seen in boys at the time of puberty?**

**Ans.** Functions of testis:

- (i) Produce sperms.
- (ii) Produces male hormone/testosterone.

These are located outside the human body, as sperms need lower temperature than the normal body temperature to mature.

Testosterone is responsible for bringing changes at the time of puberty in boys.

## Long Answer Type Questions

[5 Marks]

**Q. 1. Write two points of difference between asexual and sexual types of reproduction, Describe why variations are observed in the offspring formed by sexual reproduction.**

**Ans.**

Asexual Reproduction	Sexual Reproduction
1. Involves only one parent. 2. Gametes are not produced. 3. No fertilisation and zygote formation. 4. Meiosis does not occur at anytime during reproduction.	1. Often involves two parents. 2. Gametes are produced. 3. Fertilisation and zygote formation is observed. 4. Meiosis occurs at the time of gamete formation.

During sexual reproduction two types of gametes fuse. Although the gametes contain the same number of chromosomes, their DNA is not identical. This situation generates variations among the offspring's.

**Q.2 What is multiple fission? How does it occur in an organism? Explain briefly. Name one organism which exhibits this type of reproduction.**

**Ans.** Multiple fission is the process of reproduction in which many individuals are formed or produced from the parent cell. In this process, the nucleus divides repeatedly to produce large number of nuclei. Each nucleus gathers a bit of cytoplasm around itself and develops a membrane around each structure. Many daughter cells develop which on liberation grow into adult organism.

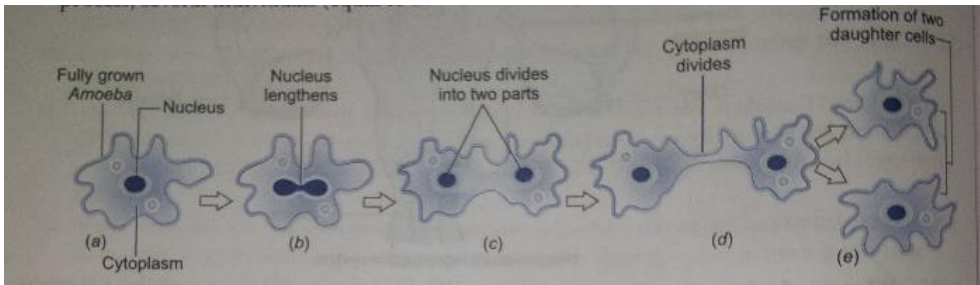
*Plasmodium* exhibits this type of fission.

**Q. 3. (a) Describe asexual reproduction in Amoeba.**

**(b) How does sexual reproduction in plants takes place?**

**Ans. (a)** In Amoeba, asexual reproduction occurs by fission (binary and multiple). In Amoeba, nucleus first divides into two daughter nuclei by mitosis and then body along with the cytoplasm constricts from the middle, which gradually deepens and eventually divides into two individual parts, each part has one nucleus. Thus, two daughter Amoebae develop from one. This is called binary fission. In multiple fission, nucleus repeatedly divides to form a large number of nuclei, which reach at the periphery. Later

cytoplasm gathers around each nucleus to form a daughter Amoeba. In this process, several individuals (equal to number of nuclei) develop from a single Amoeba.



**(b) Sexual reproduction in plants takes place in the following steps:**

- (i) The male reproductive organ 'stamen' makes the male gametes.
- (ii) The female reproductive organ 'carpel, makes the female gamete.
- (iii) The male gametes fertilise the female gametes.
- (iv) The fertilised ovules grow and become seeds.
- (v) The seeds produce new plants under favourable conditions like presence of water, warmth, air, light, etc.

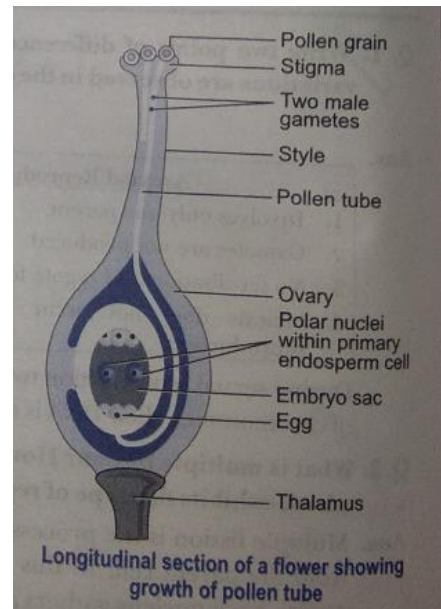
**Q. 4. (a) Describe the process of fertilisation in a flower.**

**(b) Why is the number of sperms produced always much more than the number of eggs produced?**

**Ans. (a)** A pollen grain contains two male gametes. When a pollen grain falls on the stigma of the carpel, it grows a pollen tube downwards into the style. One of the male gametes reaches the ovary through pollen tube and fuses with egg to form. The other male gamete fuses with two polar nuclei one from each end of embryo sac to form endosperm nucleus. This fusion is called triple fusion. The zygote grows into an embryo and an endosperm nucleus grows into endosperm (the food storage tissue of seed).

**(b) Sperms are produced much more in number than eggs because:**

- (i) Eggs are non-motile whereas sperms are motile and they may be misdirected while they are travelling





towards eggs.

(ii) sperms may not be able to survive under external environmental conditions for long.

(iii) To increase the probability of fertilisation of eggs.

**Q.5. (a) State in brief the functions of the following organs in the human female reproductive system:**

**Ovary, Fallopian tube, Uterus**

**(b) What is menstruation? Why does it occur?**

**Ans. (a) Functions of ovary are:**

(i) production of female gamete.

(ii) production of female hormone.

**Functions of fallopian tube are:**

(i) It is the site of fertilisation.

(ii) Transfer of female gamete from ovary takes place through it.

**Functions of uterus are:**

(i) implantation of zygote.

(i) nourishment to the developing embryo

**(b) Menstruation:** It is the periodic breakdown of uterine lining and its removal along with blood and mucous in (post pubertal stage of a) human female.

Uterine lining is required to nourish the embryo that is formed if fertilization takes place. In absence of fertilization, the lining is not required and hence is shed in the form of menstruation.

**Q. 6. Write the functions of the following in human female reproductive system:**

**Ovary, oviduct, uterus**

**How does the embryo get nourishment inside the mother's body? Explain in brief.**

**OR**

**(a) Write the functions of the following parts in human female reproductive system:**

**(i) Ovary (ii) Oviduct (iii) Uterus**

**(b) Describe the structure and function of placenta.**

**OR**

**List two functions of ovary of human female reproductive system.**

**Ans. Ovary:**

- (i) Production of female hormone (Oestrogen and progesterone).
- (ii) Production of female gamete or egg.

**Oviduct:**

- (i) Transfer of female gamete from the ovary.
- (ii) Site of fertilisation.

**Uterus:**

- (i) Implantation of zygote or embryo.
- (ii) Nourishment of developing embryo.

The embryo inside the mother's body gets nourishment through the placenta. Placenta is a special disc like tissue embedded in the mother's uterine wall and connected to the embryo. Placenta provides a large surface area for glucose and oxygen, and nutrients to pass from the mother's blood to the embryo.

**Q. 7. (a) Name the human male reproductive organ that produces sperms and also secretes a hormone.**

**Write the functions of the secreted hormone.**

**(b) Name the parts of the human female reproductive system where**

- (i) fertilisation takes place,**
- (ii) implantation of the fertilised egg occurs.**

**Explain how the embryo gets nourishment inside the mother's body.**

**Ans. (a)** Testes produce sperms and secrete a hormone called testosterone. The function of testosterone is to control the development of male sex organs and secondary sexual features.

**(b) (i)** Oviduct or fallopian tubes **(ii)** Uterus

After implantation, a disc-like special tissue called placenta develops between the uterus wall and the embryo which helps in the exchange of nutrients, oxygen and waste products between the embryo and the mother.

**Q. 9. Reproduction is essentially a phenomenon that is not for survival of an individual but for the stability of a species. Justify.**

**Ans. (a)** Organisms need energy for survival which they obtain from life processes such as nutrition and respiration.

**(b)** Reproduction needs a lot of energy.

**(c)** Genetic material is transferred from one generation to the next as a result of reproduction through DNA copying.

**(d)** DNA copying takes place with high constancy and considerable variations, that is, advantages to the species for stability in the changing environment.

## HOTS (Higher Order Thinking Skills)

**Q.1. What is self sterility mechanism in flowers which allows only cross-pollination?**

**Ans.** In self sterility, pollen grains of the same flower are not capable to fertilise that flower, e.g., potato, tobacco, tea, etc. Hence, cross-pollination is the rule applied.

**Q. 2. What are the basic differences between male and female germ cell?**

**Ans.**

<b>Male Germ Cell</b>	<b>Female Germ Cell</b>
1. Produced by male reproductive organ (testes in animals, anther in plants)	1. Produced by female reproductive organ (ovary in animals and plants)
2. Usually smaller in size and motile.	2. Usually larger in size and stores food.

**Q.3. How are general growth and sexual maturation different from each other?**

**Ans.** General growth refers to different types of developmental process in the body like increase in height, weight gain, changes in shape and size of the body but sexual maturation is specific to changes reflected at puberty like cracking of voice, new hair patterns, development of breast in female, etc.

**Q.4. Colonies of yeast fail to multiply in water, but multiply in sugar solution. Give one reason for this.**

**Ans.** Sugar provides energy for sustaining all life activities in yeasts. In water, it fails to reproduce because of inadequate energy in its cells.

## Value Based Questions

**Q. 1. We hear and read about female foeticide, which is really is a wrong practice. In some families, be it rural or urban, females are tortured for giving birth to a girl child. They do not seem to understand the scientific reason behind the birth of a boy or a girl.**

**Answer the following questions based on the information given above.**

**(i) In your opinion, is the approach of the society towards mother in this regard correct?**

**Explain the scientific reason.**

**(ii) How can you promote awareness among people?**

**(iii) What values will you be promoting by doing so?**

**Ans. (i)** In my opinion the above approach of society is baseless. Sex of child is determined by type of chromosome present in sperm (X or Y) that fuses with ovum at the time of fertilisation.

**(ii)** By organising poster making, debates and seminars.

**(iii)** Spreading social awareness against various social malaise viz. gender inequality, female foeticide, etc.

**Q. 2. Mr. Sharma was suffering from various types of diseases presently. He went for thorough health check-ups and was diagnosed to be HIV+ve. Soon this news spread in his neighbourhood and on account of this, he faced social isolation.**

**Answer the following questions based on the information given above.**

**(i) Do you think people's indifference towards HIV+ve people is justifiable? What kind of approach should we have toward the persons suffering from AIDS?**

**(ii) How can one protect oneself from this disease?**

**(iii) What values are not promoted by Mr. Sharma's neighbours?**

**Ans. (i)** Absolutely not. We should exhibit humane approach/behaviour and should not treat them as isolated.

**(ii)** One should be aware about the mode of transmission of disease, danger of sharing needles, transfusion of contaminated blood, etc.

**(iii)** Sympathy for fellow human being, care, humane nature.

**Q. 3. Arjun and Ram are students of Class-IX. Both were initially good in studies. After some time, academic performance of Arjun started declining and**

he became irritable. This change was noticed by his class teacher. While interacting with Arjun she found out that he had six siblings and the whole family lived in a single room. His mother was not able to devote much attention to him and resources were not sufficient. The teacher motivated him to concentrate on his studies and counselled him.

Answer the following questions based on the situation described above.

**(i) What do you think are the factors which are responsible for change in Arjun's behaviour and his poor performance in studies?**

**(ii) How has the Government help in promoting small families?**

**(iii) What values are promoted by the teacher?**

**Ans. (i)** Big families can be one of the reasons. Only small family gets good health and education unlike that of a large family.

**(ii)** The Government has initiated the 'Hum do hamare do' programme to provide family planning counselling, etc.

**(iii)** Caring nature, responsible.

**Q. 4. In a certain village the sex ratio is very low due to large number of cases of female infanticide. A man from the same village takes his pregnant wife to the doctor to find out whether the foetus is a girl or a boy. The doctor performs a test and tells them that it is a girl.**

Answer the following questions based on the above situation:

**(i) Name the technique used by doctor to determine the type of sex of the foetus**

**(ii) Which values are disrespected by the doctor in the above situation?**

**(iii) Suggest two actions to be taken by the administration/society to promote desired related values.**

**Ans. (i)** The technique used to determine the type of sex of the foetus is called amniocentesis.

**(ii)** Value for life, professional ethics, gender bias.

**(iii)** Enactment of law.

- awareness campaigns about declining sex ratio and its ill effects.

- education of women.

**Q. 5. Seeds have some food stored in the cotyledons that is helpful during the process of germination. A small seed can grow into a giant tree when allowed to grow in the right conditions/environment.**

Answer the following questions based on above passage:

**(i) How is the food stored in the cotyledons helpful during the process of germination?**

**(ii) List four values acquired by a student in the early stages of his/her growth which can enable him/her to achieve great heights in life.**

**(iii) Write any two environmental conditions to be provided by the parents/family to help the child's personality grow in the right direction.**

**Ans. (i)** Cotyledons contains food in the form of bio-chemical energy which is used in the process of germination.

**(ii)** Hard work, passion for learning and knowledge similarity, thinking skills and origin ability.

**(iii)** Providing opportunities for variety of learning experiences, motivation and freedom to experiment.