

Chapter 8

How do Organisms Reproduce

Multiple Choice Questions

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

- (i) banana
- (ii) dog
- (iii) yeast
- (iv) Amoeba

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

Soln:

Answer is (b) (i), (iii) and (iv)

Explanation:

Dog reproduce sexually, yeast reproduce by budding, Amoeba reproduce sexually and cultivated banana also reproduce asexually.

2. In a flower, the parts that produce male and female gametes (germ cells) are

- (a) stamen and anther
- (b) filament and stigma
- (c) anther and ovary
- (d) stamen and style

Soln:

Answer is (c) anther and ovary

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

- (a) pollination, fertilisation, seedling, embryo
- (b) seedling, embryo, fertilisation, pollination
- (c) pollination, fertilisation, embryo, seedling
- (d) embryo, seedling, pollination, fertilization

Soln:

Answer is (c) pollination, fertilisation, embryo, seedling

Explanation:

Pollination leads to fertilization after which embryo is formed. Seedling comes out from embryo.

4. Offspring formed by asexual method of reproduction have greater similarity among themselves because

- (i) asexual reproduction involves only one parent**
- (ii) asexual reproduction does not involve gametes**
- (iii) asexual reproduction occurs before sexual reproduction**
- (iv) asexual reproduction occurs after sexual reproduction**

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

Soln:

Answer is (a) (i) and (ii)

Explanation:

Asexual reproduction involve single parent and there will be no exchange of gametes hence offspring looks similar to their parent.

5. Characters transmitted from parents to offspring are present in

- (a) cytoplasm**
- (b) ribosome**
- (c) golgi bodies**
- (d) genes**

Soln:

Answer is (d) genes

6. Characters that are transmitted from parents to offspring during reproduction show

- (a) only similarities with parents**
- (b) only variations with parents**
- (c) both similarities and variations with parents**
- (d) neither similarities nor variations**

Soln:

Answer is (c) both similarities and variations with parents

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

- (a) they reproduce asexually**
- (b) they are all unicellular**
- (c) they reproduce only sexually**
- (d) they are all multicellular**

Soln:

Answer is (a) they reproduce asexually

Explanation:

Amoeba reproduce by binary fission, Spirogyra reproduce by fragmentation, yeast reproduce by budding.

8. In Spirogyra, asexual reproduction takes place by

- (a) breaking up of filaments into smaller bits
- (b) division of a cell into two cells
- (c) division of a cell into many cells
- (d) formation of young cells from older cells.

Soln:

Answer is (a) breaking up of filaments into smaller bits

Explanation:

Spirogyra reproduce by fragmentation. Spirogyra simply breaks up into smaller pieces upon maturation. These pieces or fragments grow into new individuals

9. The ability of a cell to divide into several cells during reproduction in Plasmodium is called

- (a) budding
- (b) reduction division
- (c) binary fission
- (d) multiple fission

Soln:

Answer is (d) multiple fission

Explanation:

Plasmodium divide into many daughter cell by binary multiple fission. In Multiple fission nucleus of the cell divides multiple times by mitosis then separates to create multiple daughter cells.

10. The correct sequence of reproductive stages seen in flowering plants is

- (a) gametes, zygote, embryo, seedling
- (b) zygote, gametes, embryo, seedling
- (c) seedling, embryo, zygote, gametes
- (d) gametes, embryo, zygote, seedling

Soln:

Answer is (a) gametes, zygote, embryo, seedling

Explanation:

Gametes fuse to form a zygote during fertilization. After fertilization embryo will be formed which will lead to seedling in plants.

- 11. The number of chromosomes in parents and offsprings of a particular species remains constant due to**
- (a) doubling of chromosomes after zygote formation
 - (b) halving of chromosomes during gamete formation
 - (c) doubling of chromosomes after gamete formation
 - (d) halving of chromosomes after gamete formation

Soln:

Answer is (b) halving of chromosomes during gamete formation

Explanation:

Because of halving of chromosome during gamete formation number of chromosome remain same as somatic cell of an organism. Halving of gametes in a chromosomes is called diploid number of chromosomes.

- 12. In Rhizopus, tubular thread-like structures bearing sporangia at their tips are called**
- (a) filaments
 - (b) hyphae
 - (c) rhizoids
 - (d) roots

Soln:

Answer is (b) hyphae

Explanation:

Tiny blob-on-a-stick like structures involved in reproduction are called hyphae. The blobs are called sporangia, which contain cells, or spores, that can eventually develop into new Rhizopus individuals.

- 13. Vegetative propagation refers to formation of new plants from**

- (a) stem, roots and flowers
- (b) stem, roots and leaves
- (c) stem, flowers and fruits
- (d) stem, leaves and flowers

Soln:

Answer is (b) stem, roots and leaves

Explanation:

Vegetative propagation is a type of asexual reproduction occur in plants. In vegetative reproduction new plant is produced from vegetative parts of the plants such as roots, stem, leaf and buds. In vegetative reproduction plants produced are genetically similar enough to the parent plant to have all its characteristics.

14. Factors responsible for the rapid spread of bread mould on slices of bread are

- (i) large number of spores**
- (ii) availability of moisture and nutrients in bread**
- (iii) presence of tubular branched hyphae**
- (iv) formation of round shaped sporangia**

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

Soln:

Answer is (c) (i) and (ii)

Explanation:

Large number of spores ensure a few spore survive even in adverse conditions. Availability of moisture and nutrients in the bread provides necessary environment for spore to grow into mould.

15. Length of pollen tube depends on the distance between

- (a) pollen grain and upper surface of stigma**
- (b) pollen grain on upper surface of stigma and ovule**
- (c) pollen grain in anther and upper surface of stigma**
- (d) upper surface of stigma and lower part of style**

Soln:

Answer is (d) upper surface of stigma and lower part of style

Explanation:

Length of pollen tube ensures pollens reach the stigma to conduct pollination.

16. Which of the following statements are true for flowers?

- (i) Flowers are always bisexual**
- (ii) They are the sexual reproductive organs**
- (iii) They are produced in all groups of plants**
- (iv) After fertilisation they give rise to fruits**

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

Soln:

Answer is (d) (ii) and (iv)

Explanation:

Flowers are not always bisexual hence statement i) is wrong. Only angiosperms produces flowers hence statement iii) is wrong.

17. Which among the following statements are true for unisexual flowers?

- (i) They possess both stamen and pistil**
- (ii) They possess either stamen or pistil**
- (iii) They exhibit cross pollination**
- (iv) Unisexual flowers possessing only stamens cannot produce fruits**

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

Soln:

Answer is (b) (ii), (iii) and (iv)

Explanation:

Cross pollination is necessary in unisexual flowers as they possess either stamen or pistil. Flowers possessing only stamens cannot produce fruits because fruit is a mature ovary.

18. Which among the following statements are true for sexual reproduction in flowering plants?

- (i) It requires two types of gametes**
- (ii) Fertilisation is a compulsory event**
- (iii) It always results in formation of zygote**
- (iv) Offspring formed are clones**

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

Soln:

Answer is (c) (i), (ii) and (iii)

Explanation:

Off-springs produced from sexual reproduction cannot be clones hence statement iv) is wrong.

19. In Figure 8.1, the parts A, B and C are sequentially

- (a) cotyledon, plumule and radicle
- (b) plumule, radicle and cotyledon
- (c) plumule, cotyledon and radicle
- (d) radicle, cotyledon and plumule

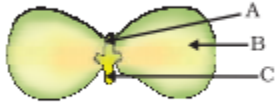


Fig. 8.1

Soln:

Answer is (c) plumule, cotyledon and radicle

20. Offspring formed as a result of sexual reproduction exhibit more variations because

- (a) sexual reproduction is a lengthy process
- (b) genetic material comes from two parents of the same species
- (c) genetic material comes from two parents of different species
- (d) genetic material comes from many parents

Soln:

Answer is (b) genetic material comes from two parents of the same species

Explanation:

In sexual reproduction zygote is formed by gametes produced by a male and a female. A male and a female gamete fuse to form a zygote which fertilizes to produce new offspring. Because of contribution of two parents off-springs incur more variations.

21. Reproduction is essential for living organisms in order to

- (a) keep the individual organism alive
- (b) fulfill their energy requirement
- (c) maintain growth
- (d) continue the species generation after generation

Soln:

Answer is (d) continue the species generation after generation

Explanation:

Reproduction is essential to the lineage of the species whereas other life processes are essential to keep the organism alive.

22. During adolescence, several changes occur in the human body. Mark one change associated with sexual maturation in boys

- (a) loss of milk teeth
- (b) increase in height
- (c) cracking of voice
- (d) weight gain

Soln:

Answer is (c) cracking of voice

Explanation:

During adolescence Following changes occur in boys

- Growth of hairs in new parts of the body such as armpits, on chest and between thighs near genital organ face, legs and on arms.
- Creaking of voice
- Skin becomes oily and pimples will start appearing
- Occasionally penis will erect especially while dreaming.

23. In human females, an event that reflects onset of reproductive phase is

- (a) growth of body
- (b) changes in hair pattern
- (c) change in voice
- (d) menstruation

Soln:

Answer is (d) menstruation

Explanation:

During adolescence Following changes occur in boys

- Growth of hairs in new parts of the body such as armpits, between thighs near genital organ thin hairs on face, legs and on arms.
- Start menstruation
- Skin becomes oily and pimples will start appearing
- Breast size will increase

24. In human males, the testes lie in the scrotum, because it helps in the

- (a) process of mating
- (b) formation of sperm
- (c) easy transfer of gametes
- (d) all the above

Soln:

Answer is (b) formation of sperm

Explanation:

Testes lying in the scrotum ensures the temperature of the testes remain lower than the body temperature. This helps in sperm production.

25. Which among the following is not the function of testes at puberty?

- (i) formation of germ cells
- (ii) secretion of testosterone
- (iii) development of placenta
- (iv) secretion of estrogen

- (a) (i) and (ii)
- (b) (ii) and (iii)
- (c) (iii) and (iv)
- (d) (i) and (iv)

Soln:

Answer is (c) (iii) and (iv)

Explanation:

Testis is a male reproductive organ but estrogen is produced in females. Placenta is formed in females during pregnancy.

26. The correct sequence of organs in the male reproductive system for transport of sperms is

- (a) testis → vasdeferens → urethra
- (b) testis → ureter → urethra
- (c) testis → urethra → ureter
- (d) testis → vasdeferens → ureter

Soln:

Answer is (a) testis → vasdeferens → urethra

Explanation:

Testis produces sperm which is transferred into epididymis through vasdeferens. From vasdeferens sperm is taken to urethra.

27. Which among the following diseases is not sexually transmitted?

- (a) Syphilis
- (b) Hepatitis
- (c) HIV - AIDS
- (d) Gonorrhoea

Soln:

Answer is (b) Hepatitis

Explanation:

Hepatitis spread through contaminated water and food.

Short Answer Questions

28. In a bisexual flower inspite of the young stamens being removed artificially, the flower produces fruit. Provide a suitable explanation for the above situation.

Soln:

When stamens of a bisexual flower are removed. Cross pollination can take place which results in fertilization and production of fruit.

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

Soln:

Reproduction is creation of new individual. In unicellular organism cell division leads to formation of new individuals. Hence cell division is a type of reproduction in unicellular organisms.

30. What is a clone? Why do offsprings formed by asexual reproduction exhibit remarkable similarity?

Soln:

Clone are the aggregate of cell or organisms which are produced asexually. Asexual reproduction involve single parent and there will be no exchange of gametes hence offspring looks similar to their parent.

31. Explain how, offspring and parents of organisms reproducing sexually have the same number of chromosomes?

Soln:

Because of halving of chromosome during gamete formation number of chromosome remain same as somatic cell of an organism. Halving of gametes in a chromosomes is called diploid number of chromosomes.

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

Soln:

Yeast requires energy for its growth and cell division. Water does not provide required energy whereas sugar provide energy hence yeast multiplies in sugar solution.

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

Soln:

Spores of bread mould needs moisture to germinate and grow. Hence mould grow profusely on a moist slice of bread.

34. Give two reasons for the appearance of variations among the progeny formed by sexual reproduction.

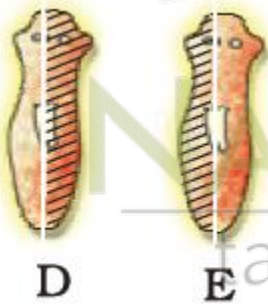
Soln:

- Gametes are contributed by two individuals of the same species.
- Crossing over occur during meiosis.

35. Would a Planaria cut vertically into two halves regenerate into two individuals? Complete Figure 8.2 D and E by indicating the regenerated regions.

Soln:

Yes Planaria cut vertically into two halves can regenerate into two individuals.



D

E

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36. 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.**

Soln:

Animals	Chromosome numbers	Plants	Chromosome numbers
Man	46	Corn	20
Cat	38	Cotton	52
Horse	64	Garden pea	14
Rabbit	44	Mango	40
Elephant	56	Onion	16

- a) Size of organism has nothing to do with chromosome numbers
- b) Organism with fewer chromosomes need not reproduce easily compared to organisms with more number of chromosomes.
- c) Chromosomes are made of DNA. Hence more number of chromosomes means more number of DNA.

37. 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?

Soln:

Number of chromosomes in both the gametes are equal hence number of chromosomes in a female gamete of tobacco plant is 24. Combining both number of chromosomes in a zygote is 48.

38. Why cannot fertilisation take place in flowers if pollination does not occur?

Soln:

Pollination is a process in which transfer of pollen grains from anthers to stigma takes place. If there is no pollination then there will be no fusion of gametes and fertilization do not take place.

39. 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?

Soln:

Meiosis is a way of cell division in which number of chromosomes get halved. After fertilization chromosomes become equal to that of somatic cells. After fertilization Mitosis takes place for the rest of the stages of life. Hence chromosomes remain constant.

40. Where is the zygote located in the flower after fertilization?

Soln:

After fertilization zygote will be located in the **ovary**.

41. Reproduction is linked to stability of population of a species. Justify the statement.

Competition for food, predation are common in nature. If there is no reproduction species would have become extinct. Hence reproduction linked to population of the species.

42. How are general growth and sexual maturation different from each other?

Soln:

General growth is all about growth of size. Sexual maturation is about achieving the ability to reproduce. General growth begins with growth of an organism whereas sexual maturity is attained at certain stage of life called as adolescence.

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

Soln:

Sequence of organs in the male reproductive system for transport of sperms is testis → epididymis → vasdeferens → prostate → urethra .

Glands associated with male reproductive system	Function
Testes	Secretion of testosterone
Prostate gland	Makes the medium of semen alkaline
Seminal vesicle	Addition of fluid content to semen
Cowper's gland	Urethra lubrication and neutralizes acidic traces of urine.

44. What changes are observed in the uterus if fertilisation does not occur?

Soln:

Following changes occur in the uterus if fertilization does not occur

- Extra lining of Uterus degenerates
- Uterus lining fragments gets discharged through vagina
- Unfertilized egg gets discharged
- Menstruation takes place

45. What changes are observed in the uterus subsequent to implantation of young embryo?

Soln:

Following changes are observed in the uterus subsequent to implantation of young embryo.

- Uterine lining thickens to support to developing embryo.(PLACENTA)
- Uterine lining is richly supplied with blood vessels so that nutrition and oxygen could be supplied to the developing foetus.

46. What are the benefits of using mechanical barriers during sexual act?

Soln:

- Mechanical barriers prevents unwanted pregnancy
- Mechanical barriers prevent sexually transmitted diseases.

47. In the given Figure 8.3 label the parts and mention their functions

- (a) Production of egg
- (b) Site of fertilisation
- (c) Site of implantation
- (d) Entry of the sperms



Fig. 8.3

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Soln:

- a) Ovary
- b) Oviduct
- c) Uterus
- d) Vaginal passage

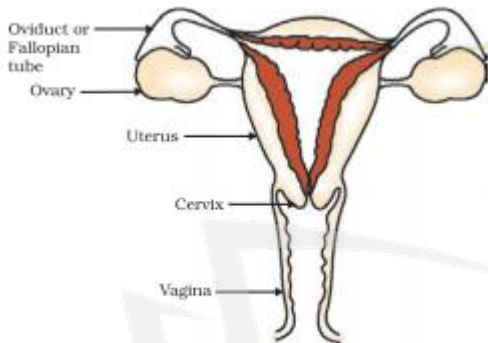


Figure 8.11 Human-female reproductive system

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

Soln:

The ratio of chromosome number between an egg and its zygote is 1:2.

Sperm contains the genetic material from the father while egg contains the genetic material from the mother. Sperm can either have X chromosome or Y chromosome but egg always have an X chromosome.

Long Answer Questions

49. Why are budding, fragmentation and regeneration all considered as asexual types of reproduction? With neat diagrams explain the process of regeneration in Planaria.

Soln:

In Budding, fragmentation and regeneration only a single parent is involved and there are no formation of gametes hence they are considered as asexual types of reproduction.

Regeneration of Planaria

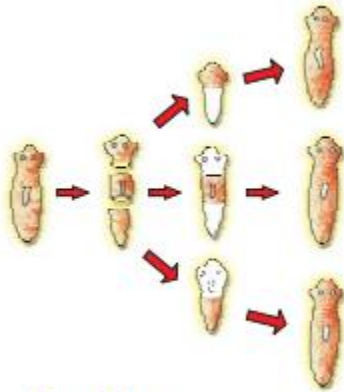


Figure 8.3 Regeneration in Planaria

Here the body of planaria cut into pieces and each piece has the ability to grow into new organism. In the figure above planaria body is cut into 3 pieces which regenerates into 3 individual cells.

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

Soln:

Sexual reproduction	Asexual reproduction
Two parents are involved	Single parent is involved
Gametes are formed	Gametes are not formed

In sexual reproduction we can find more variations when compared to asexual mode of reproduction. Following are the reasons for that.

- Gene pool are contributed by two parents
- Crossing over that occur during meiosis results in more variation
- DNA replication also contributes for the variation

51. Distinguish between pollination and fertilisation. Mention the site and product of fertilisation in a flower. Draw a neat, labelled diagram of a pistil showing pollen tube growth and its entry into the ovule.

Soln:

Pollination	Fertilization
It is the transfer of pollen grains from the anther to the stigma of a flower.	It is the fusion of male gamete with female gamete.
Achieved by agents like a wind, water or animals.	Achieved by the growth of pollen tube so that the male gamete reaches the female germ cells.
Leads to fertilization	Lead to formation of seeds
Pollination is an external process	Occurs in the ovary of female.

Ovary is the site of fertilization and pollination occurs externally

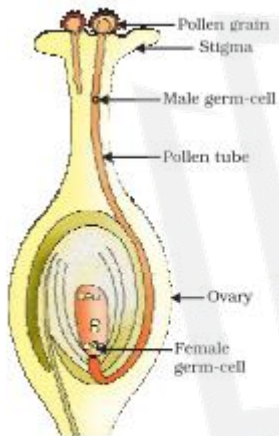


Figure 8.8
Germination of pollen on stigma

52. Distinguish between a gamete and zygote. Explain their roles in sexual reproduction.

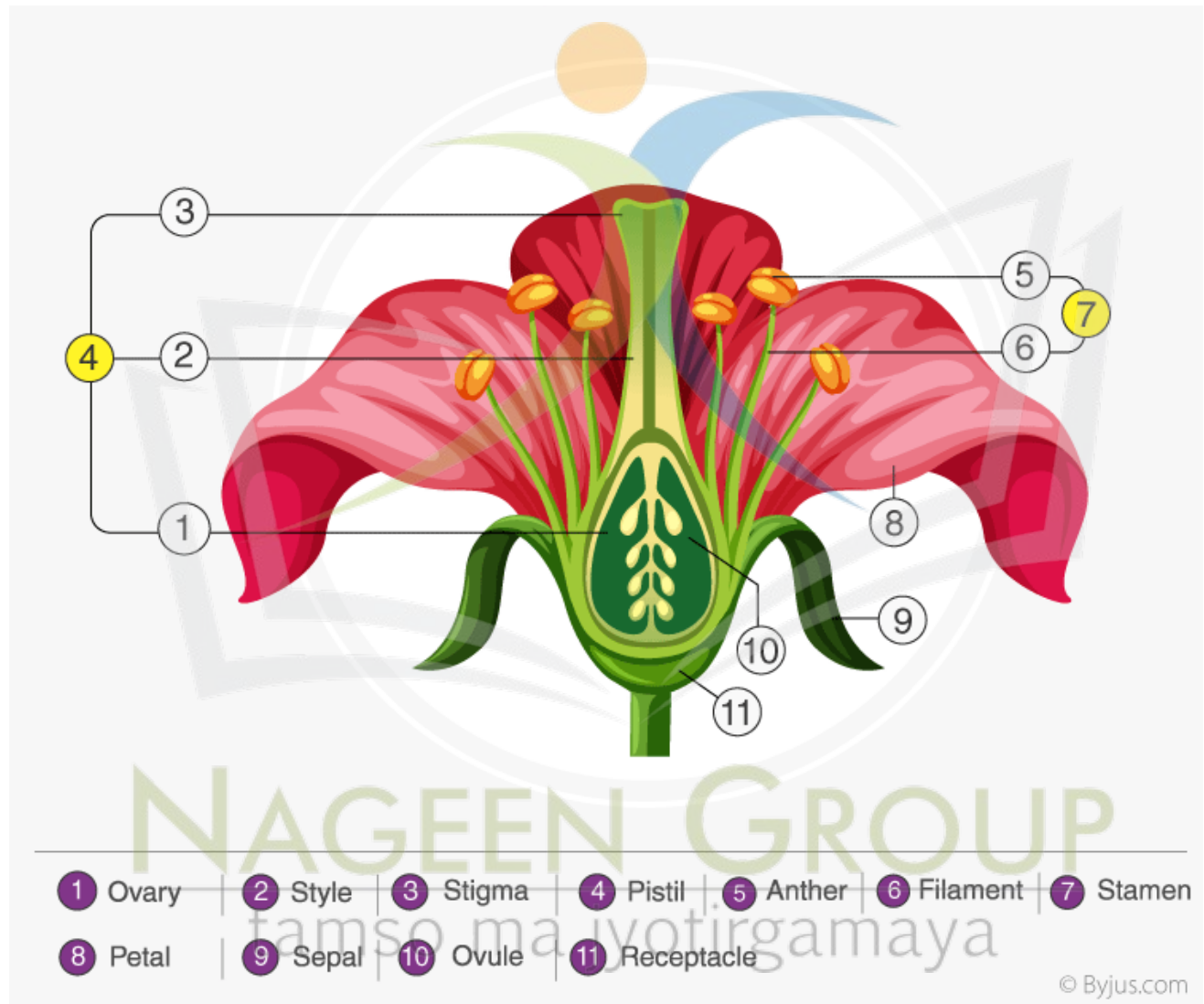
Soln:

Gamete	Zygote
Formed after Meiosis	Formed by fusion of two gametes.
Gametes produces haploid number of chromosomes	produces diploid number of chromosomes
Male and female parts produces gametes	Zygote formation takes place in female
Gametes are required for sexual reproduction	Zygote is the precursor for embryo formation

53. Draw the diagram of a flower and label the four whorls. Write the names of gamete producing organs in the flower.

Soln:

Ovary produces female gametes. Anthers produces male gametes.



54. What is placenta? Mention its role during pregnancy?

Soln:

Placenta is a disc which is embedded in the uterine wall. It contains villi on the embryo's side of the tissue. On the mother's side are blood spaces, which surround the villi. This provides a large surface area for glucose and

oxygen to pass from the mother to the embryo. The embryo gets nutrition from the mother's blood with the help of placenta. The developing embryo will also generate waste substances which can be removed by transferring them into the mother's blood through the placenta.

55. What are various ways to avoid pregnancy? Elaborate any one method.

Various ways to avoid pregnancy are given below

- a) **Physical barrier**
- b) **Copper-T**
- c) **Hormone Pills**
- d) **Surgical procedure**

Barrier method: In the barrier methods of preventing pregnancy, the physical devices such as diaphragm (or cap) and condoms are used. Diaphragm (or Cap) is used by human females which is put over the cervix. Condoms are used by males.

56. How does fertilisation take place? Fertilisation occurs once in a month. Comment.

Soln:

Once in a month one egg is released from either of the ovaries. The egg gets transferred to fallopian tube from the ovaries. Sperm swims towards fallopian tube and only one sperm can penetrate the egg at a time. This process is called fertilization.

A menstrual cycle is composed of about 28 days. This means only one egg is available for fertilization in one menstrual cycle. Hence, it can be said that fertilization can occur only once in a month.

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

Soln:

Competition for food, predation are common in nature. If there is no reproduction species would have become extinct. Hence reproduction linked to population of a species. New individuals carry lineage of their parents. More number of organisms produces counterbalances the mortality that arises due to various factors. Like this reproduction helps in maintain stability of a species.

58. Describe sexually transmitted diseases and mention the ways to prevent them.

Soln:

Disease that gets spread from person to person through sexual means are called sexually transmitted diseases. These include bacterial infections such as gonorrhoea and syphilis, and viral infections such as warts and HIV-AIDS.

Below are the ways to prevent sexually transmitted diseases

- Use of condoms or other physical barriers.
- Avoiding sexual contacts with unknown partners.
- Avoid sharing towels or underclothing.
- Get a vaccination for hepatitis B.

