How Do Organisms Reproduce

Previous Years' CBSE Board Questions

1. In which of the following organisms, multiple fission is a means of asexual reproduction? (2024)
(a) Yeast
(b) Leishmania
(c) Paramoecium
(d) Plasmodium

Answer. (d) / Plasmodium

2. (A) Plants → Deer → Lion (2024)
In the given food chain, what will be the impact of removing all the organisms of second trophic level on the first and third trophic level?
Will the impact be the same for the organisms of the third trophic level in the above food chain if they were present in a food web? Justify.

OR

(B) A gas 'X' which is a deadly poison is found at the higher levels of atmosphere and performs an essential function. Name the gas and write the function performed by this gas in the atmosphere. Which chemical is linked to the decrease in the level of this gas? What measures have been taken by an international organization to check the depletion of the layer containing this gas?

Answer. (A)

- Number of plants/organisms of first trophic level will increase.
- Number of lions/ organisms of third trophic level will decrease.
- No
- As the organisms of that level will find alternative foods and will not starve to death / food web is more stable where other animals as prey may be available.

OR

(B)
• Gas 'X' is Ozone
• Ozone shields the surface of the earth from ultra-violet (UV) radiations from the sun.
• CFCs (Chlorofluorocarbons)
• Succeeded in forging an agreement to freeze CFC production at 1986 levels / Manufacturing of CFC free refrigerators

3. (A) (i) Name three techniques/devices used by human females to avoid pregnancy. Mention the side effects caused by each.
(ii) What will happen if in a human female (a) fertilisation takes place, (b) an egg is not fertilised? (2024)

OR

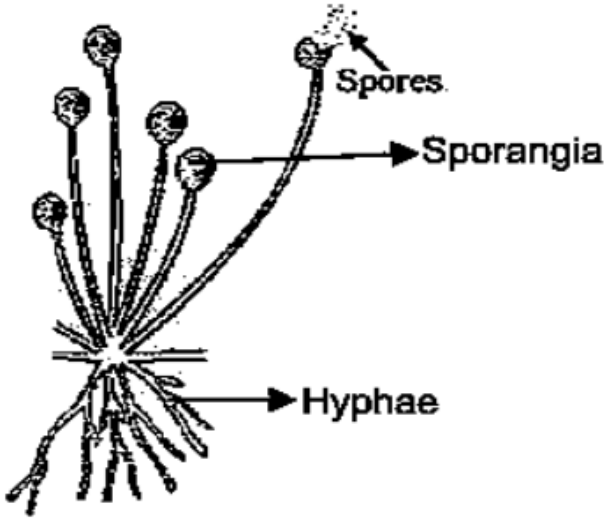
(B) (i) Draw a diagram showing spore formation in Rhizopus and label the (a) reproductive and (b) non-reproductive parts. Why does Rhizopus not multiply on a dry slice of bread ?
(ii) Name and explain the process by which reproduction takes place in Hydra.

Answer. (A) (i) • Chemical Method/Oral pills Side effects: Change the hormonal balance of the body. • Barrier method / Loop / Copper–T Side effects: Irritation in uterus.
• Surgical method / Fallopian tube in female is blocked; Side effects – may cause infections.

(ii) (a) Fertilized egg/zygote gets implanted in the lining of uterus and starts dividing
(b) If the egg is not fertilized, the thick and spongy lining of the uterus breaks and comes out through the vagina as blood and mucous.

ORs

(B) (i)



(a) Reproductive part – Sporangia
(b) Non-reproductive part – Hypha/Hyphae.

• Dry slice of bread does not provide moisture and nutrients necessary for the germination and multiplication of Rhizopus.

(ii) • Budding:
• Hydra uses regenerative cells for reproduction. A bud develops as an outgrowth due to repeated cell division at one specific site and develop into tiny individuals. On maturation, these buds detach from the parent and become new individuals.

Alternate answer:
• Regeneration:
• It is carried out by specialised cells. If hydra is cut or broken into many pieces, many of these pieces grow into separate individuals.

7.1 Do Organisms Create Exact Copies of Themselves?

VSA (1 mark)

1. Newly formed DNA copies may not be identical at times. Give one reason. (NCERT, AI 2017)

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

3. What is DNA? (Delhi 2016, Foreign 2015)

4. Name the life process of an organism that helps in the growth of its population. (AI 2015)

SA II (3 marks)

5. Reproduction is one of the most important characteristic of living beings. Give three reasons in support of the statement. (AI 2017)

6. Define reproduction. How does it helps in providing stability to the population of species?(NCERT Exemplar, Al 2016)

7. What is DNA copying? State its importance. (NCERT Intext, Delhi 2015)

8. What is the effect of DNA copying, which is not perfectly accurate, on the reproduction process? How does the amount of DNA remain constant through each new generation is a combination of DNA copies of two individuals? (AI 2014)

LA (5 marks)

(a) What is reproduction? List its two types.
(b) How are the modes of reproduction different in unicellular and multicellular organisms? (2019)

7.2 Modes of Reproduction Used by Single Organisms

MCQ

10. Assertion (A): Amoeba always produces two daughter amoebae while Plasmodium divides into many daughter cells.
Reason (R): Amoeba undergoes binary fission while Plasmodium undergoes multiple fission.
(a) Both (A) and (R) are true and (R) is the correct explanation of the assertion (A).
(b) Both (A) and (R) are true, but (R) is not the correct explanation of the assertion (A).
(c) (A) is true, but (R) is false.
(d) (A) is false, but (R) is true. (2020 C)

VSA (1 mark)

11. Define fragmentation. (2021 C)

12. Name the method by which Spirogyra reproduces under favourable conditions. Is this method sexual or asexual? (Delhi 2017)

13. How does Plasmodium reproduce? Is this method sexual or asexual? (Delhi 2017)

14. Name the part of Bryophyllum where the buds are produced for vegetative propagation. (Delhi 2016)

15. What happens when a mature Spirogyra filament attains considerable length? (AI 2016)

16. Name the method by which Hydra reproduces. Is this method sexual or asexual? (Foreign 2016)

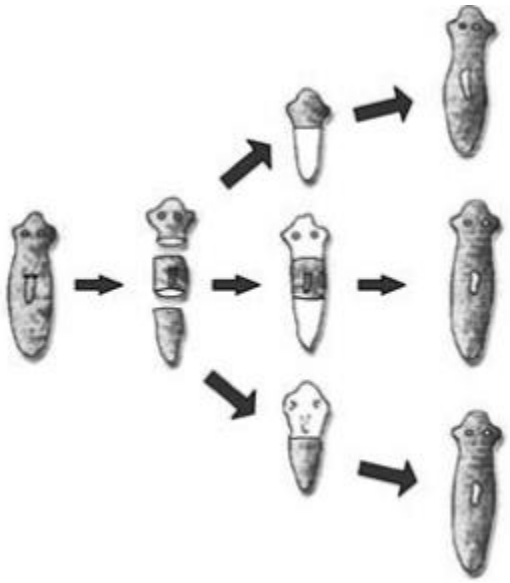
17. Name two simple organisms having the ability of regeneration. (AI 2015)

18. Name the causative agent of the disease "Kala-azar" and its mode of asexual reproduction. (Foreign 2015)

SAI (2 marks)

19. (a) Name the reproductive and non-reproductive
(b) List any two advantages of vegetative propagation. (Term II, 2021-22, Foreign 2015)

20. (a) Name the process shown below and define it:



(b) Name the type of cells present in the organisms which exhibit this process. (Term II, 2021-22) Ev

21. After examining a prepared slide under the high power of a compound microscope, a student concludes that the given slide shows the various stages of binary fission in a unicellular organism. Write two observations on the basis of which such a conclusion may be drawn. (2019)

22. Define multiple fission. Give its one example. (2019, Foreign 2014)

23. Write two differences between binary fission and multiple fission in a tabular form. (NCERT Intext, Delhi 2015)

24. List four modes of asexual reproduction other than fission in the living organisms. (Delhi 2014)

25. List four advantages of vegetative propagation. (Delhi 2014)

26. Draw labelled diagrams to illustrate budding in Hydra. (AI 2014)

27. How do Plasmodium and Leishmania reproduce? Write one difference in their mode of reproduction. (Foreign 2014) SA II (3 marks)
28. What is vegetative propagation? List with brief explanation three advantages of practising this process for growing some types of plants. Select two plants from the following which are grown by this process: Banana, Wheat, Mustard, Jasmine, Gram (2020, Foreign 2016)

29. What happens when
(a) accidently, Planaria gets cut into many pieces
(b) Bryophyllum leaf falls on the wet soil
(c) on maturation sporangia of Rhizopus bursts? (NCERT Exemplar, Delhi 2017)

30. Describe reproduction by spores in Rhizopus. (AI 2017)

31. What is vegetative propagation? State two advantages and two disadvantages of this method. (AI 2017)

32. What is multiple fission? How does it occur in an organism? Explain briefly. Name one organism which exhibits this type of reproduction. (Delhi 2016)

33. Explain the term "regeneration" as used in relation to reproduction of organisms. Describe briefly how regeneration is carried out in multicellular organisms like Hydra. (AI 2016)

34. In the context of reproduction of species state the main difference between fission and fragmentation. Also give one example of each.

35. What happens when
(a) Planaria gets cut into two pieces
(AI 2016) Ev
(b) a mature Spirogyra filament attains considerable length
(c) on maturation sporangia burst? (Foreign 2016, Delhi 2016)

36. Explain budding in Hydra with the help of labelled diagrams only.

37. (a) Name the following: (Delhi 2015)
(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. (Delhi 2015)
38. Explain the process of regeneration in Planaria. How is this process different from reproduction? (Foreign 2015, Al 2014)

39. On cutting the body of an organism into many pieces, it was observed that many of these pieces developed as new individuals. Name the process and list two organisms in which this process may be observed. Draw a schematic diagram to illustrate the changes that are likely to be observed during the development of new individuals in any one of the organisms named. (Delhi 2014)

40. Draw diagrams to explain the regeneration that takes place in each of the body parts of Planaria when its body is cut into three pieces. Name any other organism in which a similar process can be observed. (Delhi 2014)

41. List any two modes of asexual reproduction in animals. Under which mode of reproduction is vegetative propagation placed and why? List two advantages of vegetative propagation. (AI 2014)

42. What is vegetative propagation? List its two advantages. Select two plants raised by this method from the list given below: Wheat, Tomato, Rose, Pea, Gram, Corn, Banana (Foreign 2014)

LA (4/5 marks)

43. (i) Name and explain the two modes of asexual reproduction observed in Hydra.
(ii) What is vegetative propagation? List two advantages of using this technique. (2023)

44. The modes by which various organisms reproduce depend on the body design of the organisms. In asexual reproduction, a single individual parent produces offsprings without the involvement of gametes. This method is a common means of increasing the offsprings rapidly under favourable conditions. Asexual reproduction occurs mostly in unicellular organisms, some plants and certain simple multicellular animals.
(a) State the name of the organism in which binary fission takes place in a definite orientation. Also name the disease caused by this organism.
(b) List any two advantages of producing plants through vegetative propagation.
(c) Explain the process of budding in Hydra.

OR

(c) What happens when :
(1) a Spirogyra filament matures and attains a considerable length, and
(II) a sporangia in Rhizopus bursts on maturation? (Term II, 2021-22)

45. (a) Name the mode of reproduction of the following organisms and state the important feature of each mode :
(i) Planaria (ii) Hydra
(iii) Rhizopus
(b) We can develop new plants from the leaves of Bryophyllum. Comment.
(c) List two advantages of vegetative propagation over other modes of reproduction. (2020)

46. (a) Although Amoeba and Leishmania, both show same mode of reproduction, but the process of reproduction is carried out in different ways. Identify their mode of reproduction and mention the way it is carried out in

the two species.
(b) What is regeneration? Explain with the help of a diagram how this process is carried out in Planaria.
(c) Name the part of Rhizopus in which spores are formed. State the condition under which spores grow into a new individual. (2019 C)

7.3 Sexual Reproduction

Sexual Reproduction in Flowering Plants

MCQ

47. The number of chromosomes in parents and offsprings of a particular species undergoing sexual reproduction remain constant due to
(a) doubling of chromosomes after zygote formation
(b) halving of chromosomes after zygote formation.
(c) doubling of chromosomes before gamete formation
(d) halving of chromosomes at the time of gamete formation. (2023)

48. The stamen contains
(a) stigma
(c) sepal
(b) pollen grain
(d) ovule. (2020 C)

49. Seeds are called products of sexual reproduction because they
(a) give rise to new plants
(b) are formed by fusion of gametes
(c) are formed by the fusion of pollen tubes
(d) can survive for a longer period. (2020 C)

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

VSA (1 mark)

51. What are all organisms called which bear both the sex organs in the same individual? Give one example of such organism. (AI 2016)

52. List two unisexual flowers. (Foreign 2016)

53. Why is fertilisation not possible without pollination? (NCERT Exemplar, Foreign 2016)

54. Name the parts of a bisexual flower that are not directly involved in reproduction. (Foreign 2015)

55. No two individuals are absolutely alike in a population. Why? (Delhi 2014)

SAI (2 marks)

56. Mention the changes that occur in the following after fertilisation in a flower:
(a) Petals
(c) Ovary
(b) Zygote
(d) Ovule (Term-II, 2021-22 C)

57. Name the reproductive parts of an angiosperm. Where are these parts located? Explain the structure of its male reproductive part. (Term II, 2021-22)
58. (a) Which of the following flowers will have higher possibility of self-pollination?
Mustard, Papaya, Watermelon, Hibiscus
(b) List the two reproductive parts of a bisexual flower. (Term II, 2021-22)

59. Draw labelled diagram to show the following parts in an embryo of a pea seed : Cotyledon, Plumule, Radicle (2019)

SA II (3 marks)

60. In flowering plants, the pollen grains are transferred to stigma by pollination but the female germ cells are present in the ovary. Explain with the help of a labelled diagram (only concerned parts), how the male germ cells reaches the ovary. (Term II, 2021-22)

61. Define the term pollination. Differentiate between self-pollination and cross-pollination. What is the significance of pollination? (2020, Delhi 2016, Foreign 2016)

62. State the basic requirement for sexual reproduction. Write the importance of such reproductions in nature. (Delhi 2017)

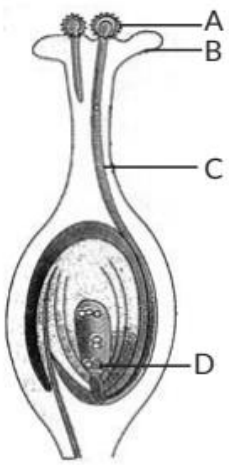
63. List any two steps involved in sexual reproduction and write its two advantages.(Delhi 2017)

64. How do organisms, whether reproduced asexually or sexually maintain a constant chromosome number through several generations? Explain with the help of suitable example. (Delhi 2016)

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

66. (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.
(ii) How does A reaches part B?
(iii) State the importance of the part C.
(iv) What happens to the part marked D afterfertilisation is over?
(NCERT Exemplar, Al 2016) Ev

67. What is sexual reproduction? List its four significances. (Foreign 2016)

68. Name the reproductive parts of an angiosperm. Where are these parts located? Explain in brief the structure of its female reproductive parts. (Foreign 2016)

69. List six specific characteristics of sexual reproduction. (AI 2015)

70. Draw longitudinal section of a bisexual flower and label the following parts on it.
(i) Anther
(iii) Stigma
(ii) Ovary
(iv) Style (NCERT Exemplar, Foreign 2015)

71. 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. (Foreign 2015, AI 2014)

72. Why is DNA copying an essential part of the process of reproduction? What are the advantages of sexual reproduction over asexual reproduction? (NCERT, Foreign 2015)

73. Draw a diagram of the longitudinal section of a flower exhibiting germination of pollen on stigma and label
(i) ovary,
(ii) male germ cell,
(iii) female germ cell and
(iv) ovule on it. (Foreign 2015)

74. Describe in brief the function of the various parts of the female reproductive part of a bisexual flower. (Foreign 2014)

75. Name the two reproductive parts of a bisexual flower which contain the germ cells. State the location and function of its female reproductive part. (Foreign 2014)

LA (5 marks)

76. (i) What happens when :
(1) Leaves of Bryophyllum fall on the soil?
(2) Planaria is cut into many pieces?
(3) Sporangia of Rhizopus on maturation liberate spores? Mention the modes of reproduction in each of the above three cases.
(ii) Write the changes that occur in a flower once the fertilization has taken place. (2023)

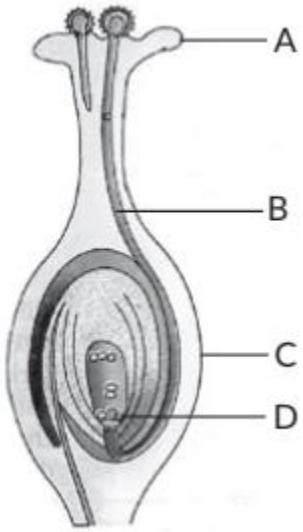
77. Draw a neat diagram showing fertilisation in a flower and label (a) pollen tube (b) Male germ cell and (c) Female germ cell on it. Explain the process of fertilisation in a flower. What happens to the (i) ovary and (ii) ovule after fertilisation? (2020)

78. (a) Identify the modes of asexual reproduction in each of the following organisms:

(i) Hydra
(ii) Planaria
(iii) Amoeba
(iv) Spirogyra
(v) Rhizopus
(b) List three advantages of vegetative propagation.
(c) Why cannot fertilisation take place in flowers if pollination does not occur? (2020)
79. Define pollination. Explain the different types of pollination. List two agents of pollination. How does suitable pollination lead to fertilisation? (Delhi 2019)

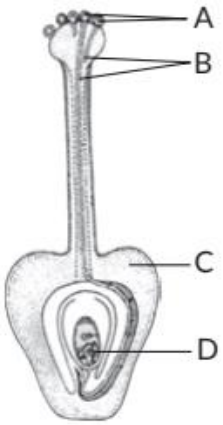
80. (a) Distinguish between cross-pollination and self- pollination. Mention the site and product of fertilisation in a flower.
(b) Draw labelled diagram of a pistil showing the following parts: Stigma, Style, Ovary, Female germ cell. (AI 2019)

81. (a) Identify A, B, C and D in the given diagram and write their names.



(b) What is pollination? Explain its significance.
(c) Explain the process of fertilisation in flowers. Name the parts of the flower that develop after fertilisation into
(i) seed (ii) fruit. (Foreign 2015)

82. (a) Name the parts labelled as A, B, C and D in the diagram given below:



(b) What is pollination? State its significance.
(c) How does fertilisation occur in flowers? Name the parts of the flower that develop into (i) seed, and (ii) fruit after fertilisation. (Al 2014)

83. (a) Give one example each of unisexual and bisexual flower.
(b) Mention the changes a flower undergoes after fertilisation.
(c) How does the amount of DNA remain constant though each new generation is a combination of DNA copies of two individuals? (Delhi 2014)

Sexual Reproduction in Human Beings

MCQ

84. Assertion (A): Sexual reproduction involves two parents of different sexes, a male and female, which produce male and female gametes respectively.
Reason (R): The male and female gametes fuse to form a zygote in sexual reproduction, which develops into a new individual.
(a) Both (A) and (R) are true and (R) is the correct explanation of the assertion (A).
(b) Both (A) and (R) are true, but (R) is not the correct explanation of the assertion (A).
(c) (A) is true, but (R) is false.
(d) (A) is false, but (R) is true. (2021 C)

85. Which one of the following is not a part of the human female reproductive system?
(a) Ovary
(c) Uterus
(b) Oviduct
(d) Seminal vesicle (2020 C)

86. Assertion (A): Testes are located outside the abdominal cavity in the scrotum.
Reason (R): Because sperm formation requires lower temperature than the normal body temperature.
(a) Both (A) and (R) are true and (R) is the correct explanation of the assertion (A).
(b) Both (A) and (R) are true, but (R) is not the correct explanation of the assertion (A).
(c) (A) is true, but (R) is false.
(d) (A) is false, but (R) is true. (2020 C)

VSA (1 mark)

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

SAI (2 marks)

88. Give reasons: (AI 2016)
(i) Placenta is extremely essential for fetal development.
(ii) Uterine lining become thick and spongy after fertilisation. (Term II, 2021 22)

89. What is puberty? Mention any two changes that are common to both boys and girls in early teenage years. (Term II, 2021-22)

90. What are testes? List two functions performed by testes in human beings. (2019 C)

91. What is the main difference between sperms and eggs of humans? Write the importance of this difference. (AI 2014)

92. List two preparations shown every month by the uterus in anticipation of pregnancy in humans. (NCERT Exemplar, Foreign 2014)

SA II (3 marks)

93. What is placenta? Explain its function in humans. (2021 C, Foreign 2015, Al 2014)

94. What are chromosomes? Explain how in sexually reproducing organisms the number of chromosomes in the progeny is maintained. (2020)

95. (a) What provides nutrition to human sperms? State the genetic constitution of a sperm.
(b) Mention the chromosome pair present in a zygote which determines the sex of (i) a female child and (ii) a male child. (2020) An

96. State the changes that take place in the uterus when:
(a) Implantation of embryo has occurred.
(b) Female gamete/egg is not fertilised. (Delhi 2017)

97. What are the functions of testes 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? (Delhi 2016)

98. (a) Mention the role of the following organs of human male reproductive system.
(i) Testes
(ii) Scrotum
(iii) Vas deferens
(iv) Prostate gland
(b) What are the two roles of testosterone? (Foreign 2016)

99. Write names of those parts of a flower which serve the same function as the following do in the animals
(i) testes
(iii) ovary
(ii) sperm
(iv) egg. (Delhi 2014)

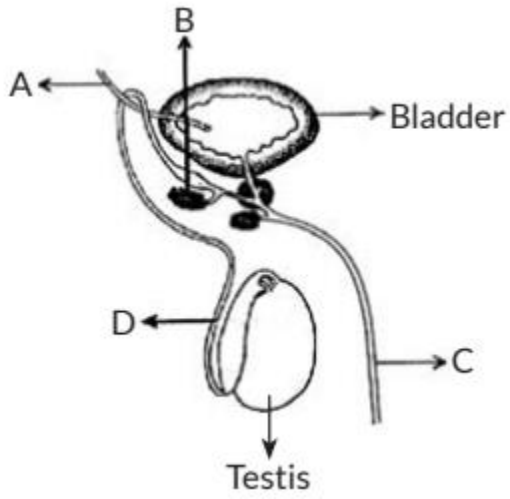
LA (5 marks)

100. (a) In the female reproductive system of human beings, state the functions of:
(i) Ovary (ii) Oviduct.
(b) Mention the changes which the uterus undergoes, when

(i) it has to receive a zygote.
(ii) no fertilisation takes place.
(c) State the functions of placenta. (2020)

101. (a) What is puberty?
(b) Describe in brief the functions of the following parts in the human male reproductive system.
(i) Testes
(ii) Seminal vesicle
(iii) Vas deferens
(iv) Urethra
(c) Why are testes located outside the abdominal cavity?
(d) State how sperms move towards the female germ cell. (2020)

102. Based on the given diagram answer the questions given below:



(a) Label the parts A, B, C and D.
(b) Name the hormone secreted by testis and mention its role.
(c) State the functions of B and C in the process of reproduction. (2020)

103. (a) Write the function of following parts in human female reproductive system:
(i) Ovary (ii) Oviduct
(iii) Uterus
(b) Describe in brief the structure and function of placenta. (NCERT Exemplar, Al 2018, Delhi 2016)

104. (a) Name the organ that produces sperms as well as secretes a hormone in human males. Name the hormone it secretes and write its functions.
(b) Name the part of the human female reproductive system where fertilisation occurs.
(c) Explain how the developing embryo gets nourishment inside the mother's body. (Delhi 2017)

105. What is placenta? Describe its structure. State its functions in case of a pregnant human female. (NCERT Exemplar, Al 2016)

106. (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? (NCERT, Foreign 2016)

107.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. (Delhi 2015)

108.(a) Name the human male reproductive organ that produce 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. (Al 2015)

OR

(a) Write the name of the human male reproductive organ that produces sperms and secretes a hormone. Name the hormone secreted and state its functions.
(b) Write the site of fertilisation and the part where the zygote gets implanted in the human female.
(c) State, in brief, how an embryo gets its nourishment inside the mother's body. (Delhi 2014)

109.(a) Name the respective part of human female reproductive system:
(i) that produces egg
(ii) where fusion of egg and sperm takes place, and
(iii) where zygote gets implanted.

(b) Describe in brief what happens to the zygote after it gets implanted. (Delhi 2014)

110. (a) Draw a sectional view of human female reproductive system and label that part where
(i) eggs develop
(ii) fertilisation take place
(iii) fertilised egg gets implanted
(b) Describe, in brief, the changes that uterus undergoes
(i) to receive the zygote
(ii) if zygote is not formed. (Al 2014)

Reproductive Health

MCQ

111. The bacterial and the viral infections that may be caused due to unsafe sex respectively are
(a) Warts and HIV-AIDS
(b) HIV-AIDS and Warts
(c) Gonorrhoea and Syphilis
(d) Syphilis and Warts. (2023)

112. Which of the following techniques is used as a contraceptive method in males only?
(a) Copper-T
(b) Oral pills
(c) Blockage of fallopian tube
(d) Blockage of vas deferens (2020 C)

VSA (1 mark)

113.Name two infections which can be sexually transmitted in human beings. (2020 C)

SAI (2 marks)

114. Name the part/organ of the human female reproductive system
(a) where contraceptive devices such as loop or copper-T are placed to prevent pregnancy.
(b) which is blocked to prevent the transfer of eggs.

(c) where formation of green cells as ova takes place.
(d) from where the embryo gets nutrition from the mother's blood. (Term-II, 2021-22)

SA II (3 marks)

115. (a) Explain the surgical method of contraception used by
(i) males, and
(ii) females to prevent fertilisation.
(b) Write the role of oral pills taken by women as a contraceptive. (2021 C)

116. What are sexually transmitted diseases? List two examples each of diseases caused due to (i) bacterial infection and (ii) viral infection. Which device or devices may be used to prevent the spread of such diseases? (2019, NCERT Exemplar, Delhi 2015)

117. List three techniques that have been developed to prevent pregnancy. Which one of these techniques is not meant for males? How does the use of these techniques have a direct impact on the health and prosperity of a family? (NCERT Exemplar, Al 2017)

118.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. (Delhi 2016)

119. 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. (AI 2015)

120. List any four methods of contraception used by humans. How does their use have a direct effect on the health and prosperity of a family? (Delhi 2015, 2014)

OR

List four methods of contraception used by humans. Justify the following statement. "The use of contraceptive methods has a direct effect on the health and prosperity of a family." (NCERT, AI 2014)

121. On the notice board of ultrasound clinics it is generally stated. "Here prenatal sex determination and disclosure of sex (boy or girl before birth) of fetus is not done. It is prohibited and punishable under law."

(a) List two advantages of imposing ban on prenatal sex determination.
(b) What can students do to educate the society about the following?
(i) The ill-effects of indiscriminate female feticide.
(ii) Adopting small family norms. (Foreign 2014)

LA (4/5 marks)

122. (i) Where are testes located in the human males and why? State two functions of the testes.
(ii) In the human female, one of the ovaries releases an egg every month. State the changes that take place if
(1) the egg is fertilized
(2) the egg is not fertilized
(iii) What is done during the surgical method in males and females to prevent pregnancy? (2023)

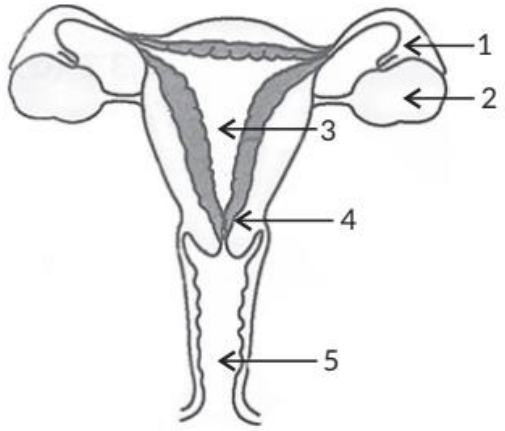
123. The growing size of the human population is a cause of concern for all people. The rate of birth and death in a given population will determine its size. Reproduction is the process by which organisms increase their population. The process of sexual maturation for reproduction is gradual and takes place while general body growth is still going on. Some degree of sexual maturation does not necessarily mean that the mind or body is ready for sexual acts or for having and bringing up children. Various contraceptive devices are being used by human beings to control the size of population.
(i) List two common signs of sexual maturation in boys and girls.
(ii) What is the result of reckless female feticide?
(iii) Which contraceptive method changes the hormonal balance of the body?
(iv) Write two factors that determine the size of a population. (2020)

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

125. (a) Suggest any two categories of contraceptive methods to control the size of human population which is essential for the prosperity of a country. Also explain about each method briefly.
(b) Name two bacterial and two viral infections each that can get sexually

transmitted.
(c) List two advantages of using condom during sexual act. (2020)

126. (a) Identify the given diagram. Name the parts 1 to 5.



(b) What is contraception? List three advantages of adopting contraceptive measures. (NCERT Exemplar, Delhi 2019)

127. (a) Draw a diagram of human female reproductive system and label the parts: (i) which produce an egg
(ii) where fertilisation takes place
(b) List two bacterial diseases which are transmitted sexually.
(c) What are contraceptive devices? Give two reasons for adopting contraceptive devices in humans. (AI 2019)

CBSE Sample Questions

7.2 Modes of Reproduction Used by Single Organisms

SAI (2 marks)

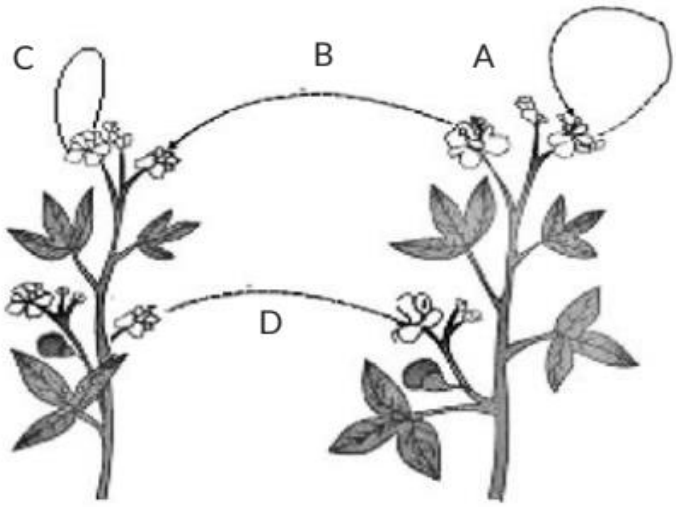
1. Rajesh observed a patch of greenish black powdery mass on a stale piece of bread.
(a) Name the organism responsible for this and its specific mode of asexual reproduction.
(b) Name its vegetative and reproductive parts. (Term II, 2021-22)

7.3 Sexual Reproduction

Sexual Reproduction in Flowering Plants

MCQ

The diagram shown below depicts pollination. Choose the options that will show a maximum variation in the offspring.



(a) A, B and C
(b) B and D
(c) B, C and D
(d) A and C

(2022-23) U

SAI (2 marks)

3. Mustard was growing in two fields - A and B. While field A produced brown coloured seeds, field B produced yellow coloured seeds. It was observed that in field A, the offsprings showed only the parental trait for consecutive generations, whereas in field B, majority of the offsprings showed a variation in the progeny. What are the probable reasons for these? (Term II, 2021-22)

LA (5 marks)

4. Trace the changes that take place in a flower from gamete formation to fruit formation. (2020-21)

Sexual Reproduction in Human Beings

SAI (2 marks)

5. (a) Trace the path a male gamete takes to fertilise a female gamete after being released from the penis.

(b) State the number of sets of chromosomes present in a zygote.(Term II, 2021-22)

LA (5 marks)

6. (a) Why is it not possible to reconstruct the whole organism from a fragment in complex multicellular organisms?
(b) Sexual maturation of reproductive tissues and organs are necessary link for reproduction. Elucidate. (2022-23)

7. (a) How are variations useful for species if there is drastic alteration in the niches?
(b) Explain how the uterus and placenta provide necessary conditions for proper growth and development of the embryo after implantation. (2022-23)

SOLUTIONS

Previous Years' CBSE Board Questions

1. When a cell reproduces, DNA replication occurs which results in formation of two similar copies of DNA. The process of copying the DNA leads to some variations each time. As a result, the DNA copies produced are similar to each other but sometimes may not identical.

2. When a cell reproduces, DNA replication occurs which forms two similar copies of DNA.

3. DNA (deoxyribonucleic acid) is a polymer made up of large number of nucleotide units. It carries genetic information from generation to generation.

4. Reproduction is a life process that helps in multiplication of an organism and growth of its population.

5. Reproduction is one of the most important characteristics of living beings because:
(i) it is essential for existence and continuity of a species.
(ii) it helps to pass genetic information to next generation.
(iii) it brings variations in next generation which is the basis for evolution.

6. The production of new organisms by the existing organisms of the same species is known as reproduction. It is linked to the stability of population of a

species. DNA replication during reproduction ensures transfer of specific characters or body design features that is essential for an individual of a population to live and use that particular niche. Some variations present in a few individuals of population caused due to reproduction which also helps in their survival at changing niches.

7. DNA copying is the production of similar copies of DNA present in a cell using various chemical reactions. DNA copying is essential for reproduction through which the organisms pass on their body features to their offspring. Moreover, minor alternations during the process of DNA copying result in the production of variations. Such variations are useful for the survival of species over time.

8. In the process of reproduction, if DNA copying is not perfectly accurate, variation occurs. These in turn may allow few individuals of a population to survive in an altered niche and becomes the basis of evolution and over time. Such variations are useful for the survival of species. The combination of DNA copies of two individuals (male and female) occurs during sexual reproduction. Reduction division (meiosis) during gamete formation halves the chromosome number in both male and female gametes. Since these two gametes fuse during fertilisation, the original number of chromosomes (as in the parent) is restored in the offspring. By this way the amount of DNA remains constant in each new generation. Concept Applied Reduction division occurs during sexual reproduction.

9. (a) Reproduction is the production of new individuals of the same species by existing organisms. It is of two types-asexual reproduction and sexual reproduction.
(b) Unicellular organisms generally reproduce asexually by fission, budding and spore formation. They have only one celled body and can multiply easily by simple cell division. The multicellular organisms use both asexual and sexual methods for reproduction. Simple multicellular organisms usually follow the asexual methods of reproduction while the complex multicellular organisms reproduce mainly by sexual reproduction.

10. (a) Amoeba reproduce through binary fission and produces two daughter amoebae. Plasmodium reproduces through multiple fission and splits to form many new organisms.

11. Fragmentation is the mode of reproduction in which parent body breaks into two or more fragments and each fragment develops into a new individual. E.g., Spirogyra.
12. The method by which Spirogyra reproduces under favorable conditions is fragmentation. This is an asexual mode of reproduction.

13. Plasmodium reproduces through multiple fission method. In this method, the parent organism splits to form many new organisms at the same time. This is an asexual method of reproduction.

14. Bryophyllum propagates vegetatively by the buds produced at the margins of leaves.

15. When a mature Spirogyra filament attains considerable length it simply breaks into two or more fragments and each fragment, then grows into a new Spirogyra.

16. Hydra generally reproduces through budding. It is an asexual method of reproduction.

17. Hydra and Planaria are two organisms that have the ability to regenerate.

18. Causative agent of the disease Kala-azar is Leishmania. It reproduces asexually by binary fission.

19. (a) Reproductive part of bread mould or Rhizopus- Sporangia, a bob like structure which contain spores. Non-reproductive part - Hyphae, which are thread like structures developed on bread.
(b) Advantages of vegetative propagation:
(i) It produces a large number of plants in shortest time.
(ii) All plants produced are genetically similar to parent, preserves purity, resistance and good qualities.

20. (a) The process shown is regeneration in Planaria. Regeneration is the ability to give rise to a new individual from any broken or injured body part.
(b) Regeneration in Planaria is carried out by specialised cells known as neoblasts (stem cells).

21. The two observations that was taken by the student that concludes that the given slide shows the various stages of binary fission in a unicellular organism are as follows:

(i) Presence of unicellular and uninucleate organism showing irregular outline.
(ii) Division of nucleus of parent cell into two equal halves.

22. Multiple fission is an asexual mode of reproduction in which the parent organism splits to form many new organisms at the same time. Multiple fission occurs in Plasmodium.

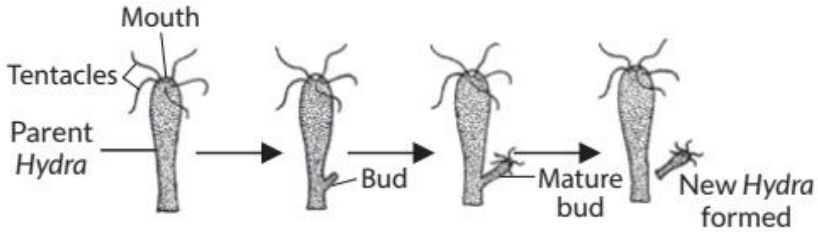
23. Differences between binary fission and multiple fission are as follows:

S. No.	Binary fission	Multiple fission
(i)	The parent organism, splits to form two new organisms, *e.g.*, *Amoeba*, *Paramecium*.	The parent organism splits to form many new organisms at the same time, *e.g.*, *Plasmodium*.
(ii)	The nucleus of the parent body divides only once to produce two nuclei.	The nucleus of the parent body divides repeatedly to produce many nuclei.

24. The four modes of asexual reproduction other than fission in living organisms are :
(i) budding
(iii) regeneration and
(ii) spore formation
(iv) fragmentation.

25. Four advantages of vegetative propagation are as follows:
(i) The characters of the parent plants are preserved hence a good variety produced can be propagated by vegetative means.
(ii) The plants, which do not produce viable seeds or produce very few seeds, can be reproduced by this method. For example, banana, potato, grapes, sugarcane, rose, orange, etc.
(iii) It is an easier, quicker and cheaper method of propagation.
(iv) It is easier to get rid of pathogen from any part of plant by vegetative propagation.

26. The given diagram illustrates budding in Hydra:



27. Plasmodium and Leishmania reproduce by the process of fission which is an asexual mode of reproduction. Plasmodium reproduces by multiple fission. About 1000 daughter cells are produced by the multiple fission of a Plasmodium. Leishmania reproduces by the process of binary fission. In Leishmania, the splitting of parent cell takes place in a definite plane (longitudinally) with respect to flagellum at its end to produce two daughter cells.

28. Vegetative propagation is an asexual method of reproduction in plants. In this method, new plants are obtained from the parts of old plants (like stems, roots and leaves), without the help of any reproductive organs. Advantages of vegetative propagation are as follows:
(i) Vegetative propagation is usually used for the propagation of those plants which produce either very few seeds or do not produce viable seeds.
(ii) Seedless plants can be obtained by artificial vegetative propagation.
(iii) Grafting is a propagation method which is very useful for fruit trees and flowering bushes. It enables to combine the most desirable characteristics of two plants. Banana and jasmine are generally grown through vegetative propagation method.

29. (a) When Planaria accidently gets cut into many pieces then its each piece grows into a complete organism. This is known as regeneration.
(b) When the Bryophyllum leaf falls on the wet soil, the buds present in the notches along the leaf margin develop into new plants. This is known as vegetative propagation.
(c) The sporangia of Rhizopus contain cells or spores that can eventually develop into new Rhizopus individuals when it bursts on maturation.

30. Fungus Rhizopus reproduces by spore formation. During the growth of Rhizopus, small rounded, bulb-like structures develop at the top of the erect hyphae. Such structures are called sporangia. Inside each sporangium, nucleus

divides several times. Each nucleus gets surrounded by a little amount of cytoplasm to become spore. Large number of spores are formed inside each sporangium. After sometime sporangium bursts and spores are released in the air. When these spores land on food or soil, under favourable conditions, they germinate into new individuals.

31. Vegetative propagation is a type of asexual reproduction in which the plant parts other than seeds are used as a propagule. Advantages of vegetative propagation:
(i) Desirable character of the plant can be preserved through generation.
(ii) Seedless plants can be grown via this method. Disadvantages of vegetative propagation:
(i) Plants produced by this method posses less vigour and are more prone to diseases.
(ii) Plants produced by this method show no genetic variation.

32. Multiple fission refers to the process of asexual reproduction in which many individuals are formed from a single parent. This method of reproduction occurs in unfavourable conditions. The unicellular organism develops a protective covering called cyst, over the cell. The nucleus of the cell divides repeatedly producing many nuclei. Later on, each nucleus is surrounded by small amount of cytoplasm and many daughter cells are produced within the cyst. When conditions are favourable, the cyst breaks and small offspring are liberated. This type of reproduction is seen in some protozoans, e.g., malarial parasite (Plasmodium).

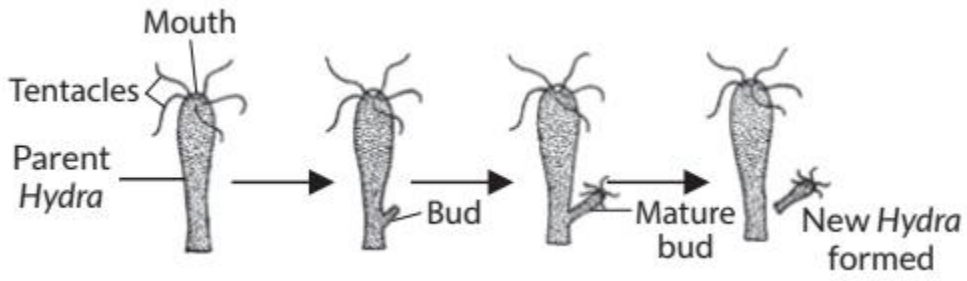
33. The process of formation of entire organism from the body parts of a fully differentiated organism is called regeneration. It occurs by process of growth and development. Simple animal like Hydra shows regeneration. When a small piece of Hydra breaks off it grows into complete new Hydra. During regeneration, the cells of cut body part of the organism divide rapidly to make a mass of cells. The cells here move to their proper places within the mass where they have to form different types of tissues. In this way complete organism is regenerated.

34. The main differences between fission and fragmentation are as follows:

S. No.	Fission	Fragmentation
(i)	Occurs in unicellular organisms.	Occurs in multicellular organisms.
(ii)	Body of organism divides by mitotic divisions into two or more daughter cells. *E.g., Leishmania.*	Body of the organism splits into one or more fragments and each fragment forms a complete organism. *E.g., Spirogyra.*

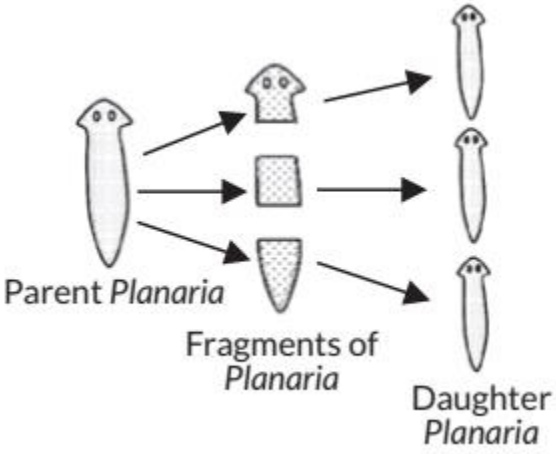
35. (a) When Planaria is cut into two pieces then each piece grows into a complete organism. This is known as regeneration.
(b) When a mature Spirogyra filament attains a considerable length it breaks into small pieces called fragments. These fragments grow into new individuals and this mode of reproduction is called fragmentation.
(c) When a sporangium burst, large number of spores are released in the air. When these spores land on food or soil, under favourable conditions they germinate into new individuals.

36. The given diagram illustrates budding in Hydra:



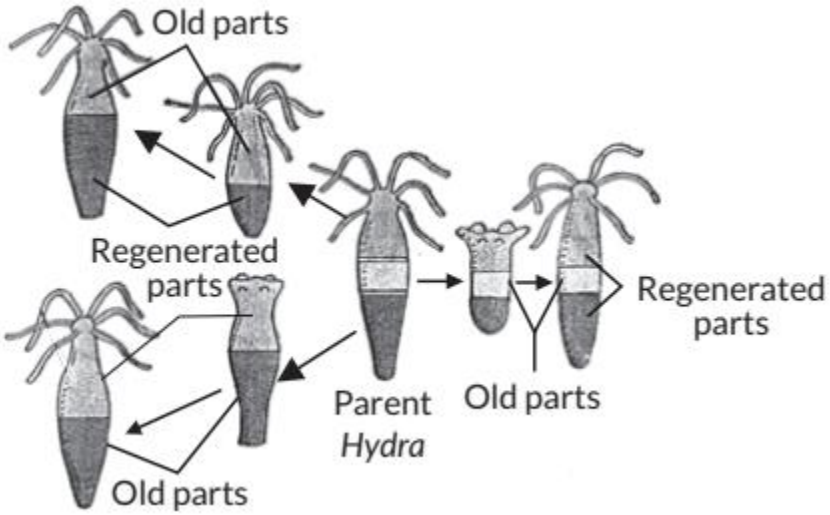
37. (a) (i) Thread like non-reproductive structures present in Rhizopus are called hyphae.
(ii) 'Blobs' developing at the tip of hyphae are called sporangia which contain spores.
(b) The structures called spores (released from 'blobs') are present in sporangia which can develop into new Rhizopus individuals. These spores are covered with thick walls that protect them until they come in contact with another moist surface and can begin to grow.

38. Regeneration is the formation of the whole body of an organism from its own small fragments. Planaria possesses great power of regeneration. If the body of Planaria somehow gets cut into a number of pieces, then each body piece can regenerate into a complete Planaria by growing all the missing parts. This is shown in given figure:

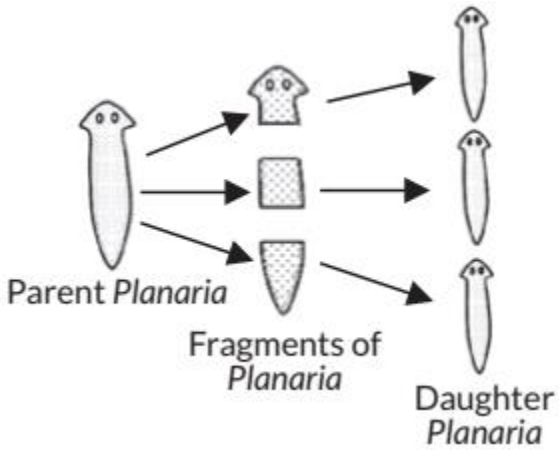


During the process of reproduction, new organism is formed from the complete parent organism. However, during fragmentation, a fragment of original parent body grows into new individual.

39. On cutting the body of an organism into many pieces, each of these pieces develop as new individuals. Hydra and Planaria are the organisms in which this process may be observed. Following is the diagram showing development of new individuals by regeneration of body parts of a parent Hydra:



40. The diagram showing development of new individuals from fragments of Planaria is as follows:



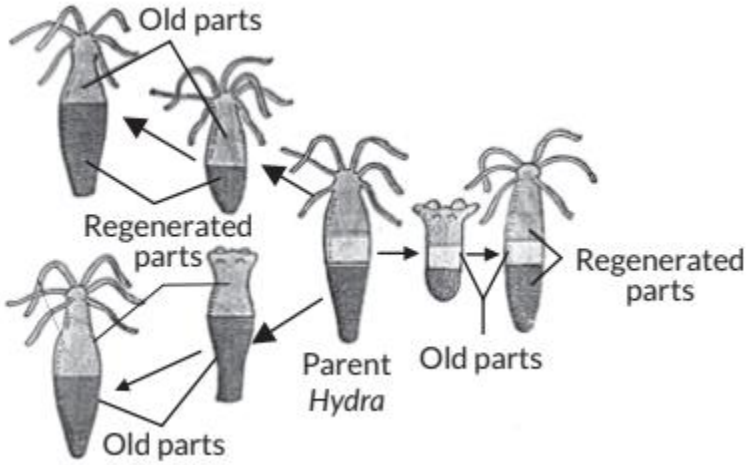
Hydra is another organism in which regeneration is observed.

41. The two modes of asexual reproduction in animals are: (i) fission and (ii) fragmentation. Vegetative propagation is placed under asexual mode of reproduction because in this mode new plants are obtained from the parts of old plants (like stems, roots and leaves), without the help of any reproductive organs. Advantages of vegetative propagation:
(i) It produces a large number of plants in shortest time.
(ii) All plants produced are genetically similar to parent, preserves purity, resistance and good qualities.

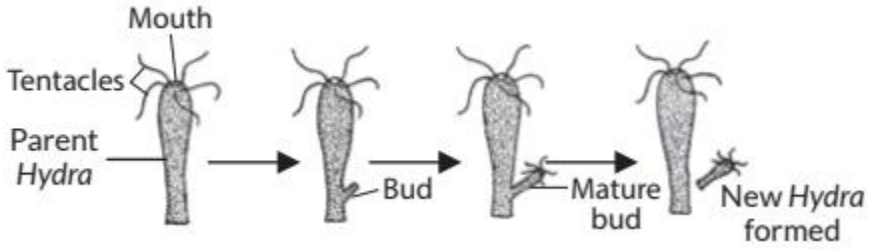
42. Vegetative propagation is a type of asexual reproduction in which the plant parts other than seeds are used as a propagule. Advantages of vegetative propagation:
(i) Desirable character of the plant can be preserved through generation.
(ii) Seedless plants can be grown through this method. Banana and rose are propagated by vegetative propagation.

43. (i) Hydra reproduces by two different asexual methods; namely regeneration and budding. Regeneration in Hydra: When a small piece of Hydra breaks off, it grows into complete new Hydra. During regeneration, the cells of cut body part of the organism divide rapidly to make a mass of cells. The cells here move to their proper places within the mass where they have to form different type of tissues. In this way complete organism is regenerated.

Given figure shows development of new individuals by regeneration of body parts of a parent Hydra.

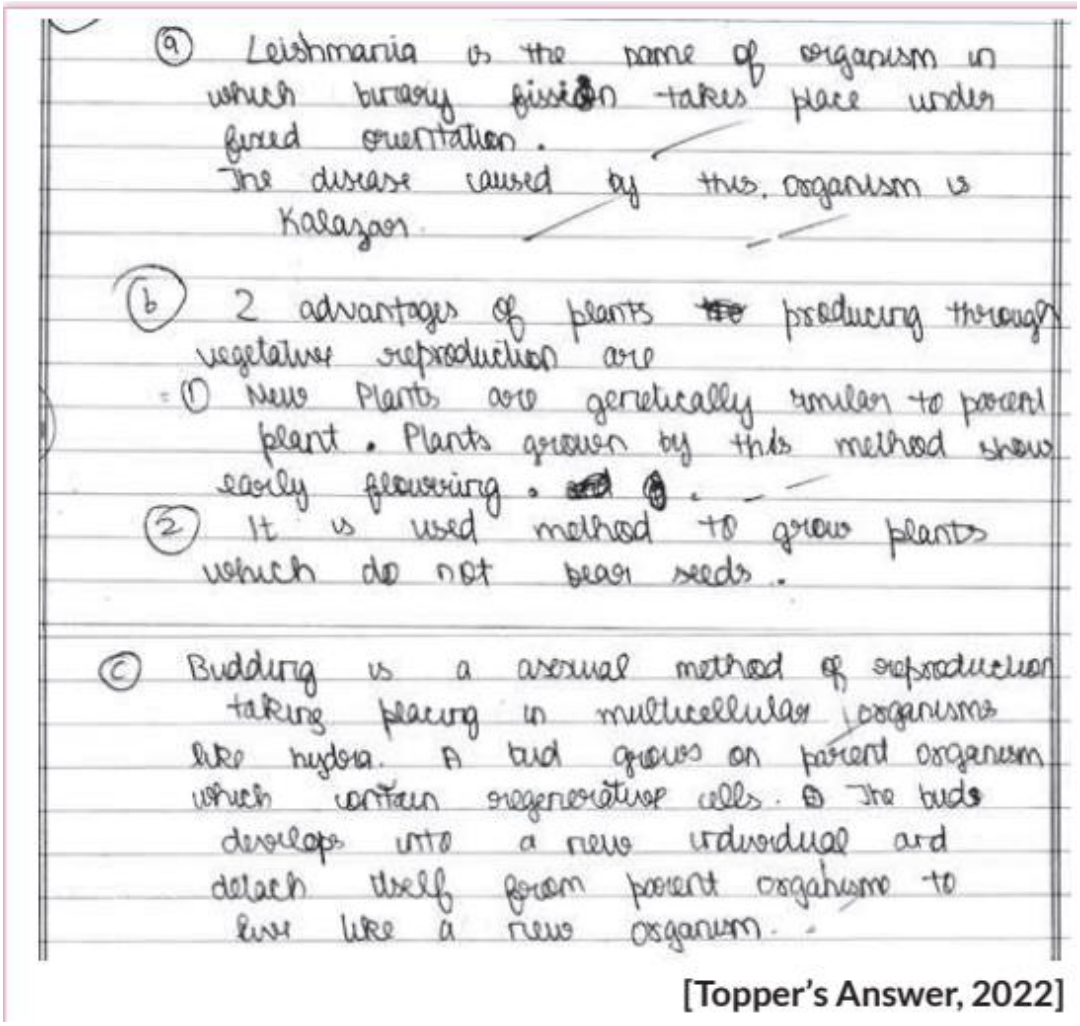


Budding in Hydra: In Hydra, a small protuberance arises from one side of the body. The protuberance grows and develops adult like structure. It develops hypostome and tentacles at its free end and also develops a basal disc at the point of attachment with the parent organism and finally gets detached to lead an independent life. The given diagram illustrates budding in Hydra:



(ii) Vegetative propagation is an asexual method of reproduction in plants. In this method, new plants are obtained from the parts of old plants (like stems, roots and leaves), without the help of any reproductive organs. Advantages of vegetative propagation are as follows:
(1) Vegetative propagation is usually used for the propagation of those plants which produce either very few seeds or do not produce viable seeds.
(2) Seedless plants can be obtained by artificial vegetative propagation.

44.



(a) Leishmania is the name of organism in which binary fission takes place under fixed orientation.
The disease caused by this organism is Kalazar.

(b) 2 advantages of plants producing through vegetative reproduction are
(1) New Plants are genetically similar to parent plant. Plants grown by this method show early flowering.
(2) It is used method to grow plants which do not bear seeds.

(c) Budding is a asexual method of reproduction taking placing in multicellular organisms like hydra. A bud grows on parent organism which contain regenerative cells. The buds develops into a new individual and detach itself from parent organism to live like a new organism.

[Topper's Answer, 2022]

OR

(c) (1) When a mature Spirogyra filament attains considerable length it simply breaks into two or more fragments and each fragment, then grows into a new Spirogyra.
(II) The sporangia of Rhizopus contain cells or spores that can eventually develop into new Rhizopus individuals when it bursts on maturation..

45. (a) (i) Planaria - Regeneration
- Regeneration of organism from its cut body parts occurs by the process of growth and development.
- Regeneration is an asexual mode of reproduction common in lower plants and animals.
(ii) Hydra - Budding

- In budding, a small part of the body of the parent organism grows out as a bud which on detaching forms a new organism.
(iii) Rhizopus - Spores
- Spores are usually produced in sporangia.
- Spore formation is a common method of an asexual reproduction in bacteria and most of the fungi.
(b) The leaves of a Bryophyllum have special type of buds in their margins. These buds may get detached from the leaves, fall to ground and then grow to produce new Bryophyllum plants. The buds can also drop to the ground together with the leaf and then grow to produce new plants.
(c) Advantages of vegetative propagation are:
(i) The new plants produced by artificial vegetative propagation are exactly like the parent plants.
(ii) Many plants can be grown from one plant by vegetative propagation.

46. (a) Amoeba and Leishmania both shows binary fission. Binary fission involves division of cell into nearly equal sized identical daughter cells.
- In Amoeba, simple binary fission or irregular binary fission occurs in which division occur through any plane.
- In Leishmania, longitudinal binary fission the plane of division passes along the longitudinal axis of the animal.
(b) Refer to answer 38.
(c) Refer to answer 30.

47. (d)

48. (b): Stamen is male reproductive organ of plant which is made up of anther and filament. The anther produces pollen grains.

49. (b):Seeds are the products of sexual reproduction because fusion of male and female gametes results into formation of zygote which in turn undergoes meiotic division to form embryo. Embryo further develops within the ovule which becomes a seed.

50. (b)

51. Organisms which bear both male and female sex organs in the same individual are called bisexual. For example, Hibiscus.

52. Flowers of papaya and cucumber are unisexual.

53. The process of pollination (in plants) ensures that male gametes bearing structure called pollen comes in contact with the female reproductive structure of the plant. Once the male and female gametes are in close vicinity, they fuse and fertilisation is accomplished. Hence, fertilisation cannot take place without pollination.

54. Calyx and corolla are parts of a flower that are not directly involved in reproduction.

55. No two individuals are absolutely alike in a population because sexual reproduction promotes diversity of characters in the offspring by providing genetic variation.

56. (b): After fertilisation, the fertilised egg (or zygote) divides several times to form an embryo within the ovule. The ovule develops a tough coat around it and is gradually converted into a seed. The ovary of flower develops and becomes a fruit (with seeds inside it). The other parts of flower like sepals, petals, stamens, stigma and style dry up and fall off. Only the ovary is left behind. So, at the place on plant where we had a flower originally, we now have a fruit (which is the ovary of the flower containing seeds). A fruit protects the seeds.

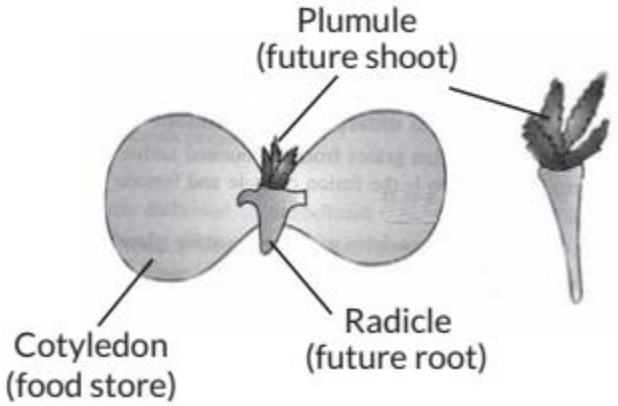
57. The reproductive parts of an angiosperm are stamen (male reproductive part) and carpel (female reproductive part). They are located in a flower. Stamen is the male reproductive part of a flower.

The stamen consists of: -

(a) Anther: It stores pollen grains.
(b) Filament : A long slender stalk like structure which supports the anther.

58. (a) Mustard and Hibiscus will have higher possibility of self pollination, since these are bisexual flowers i.e., produced on the same plant.
(b) The two reproductive parts of a bisexual flower are stamens (male reproductive part) and carpels (female reproductive part).

59. Embryo of pea seed is shown as follows:



60.

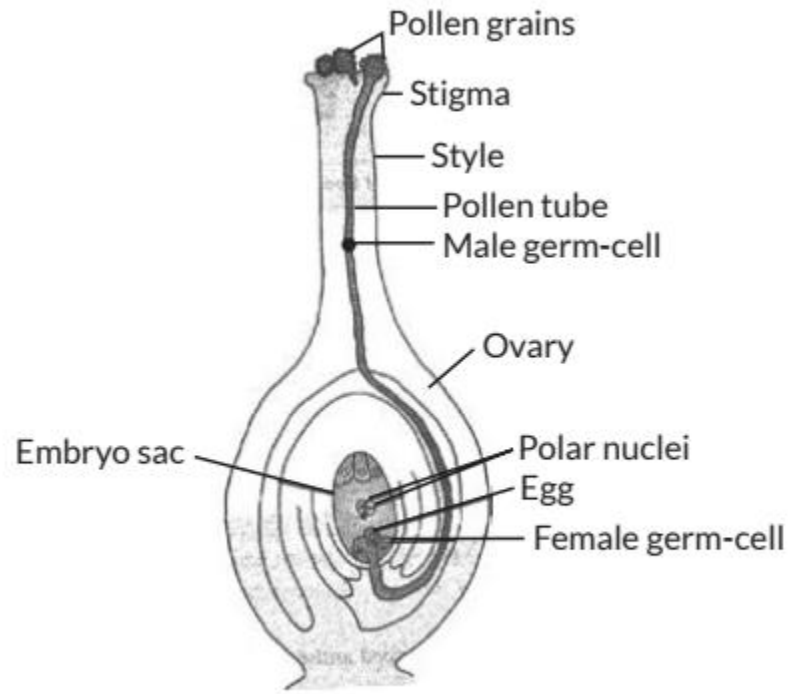


Fig.: Fertilisation in a flowering plant

61. The process of transfer of pollen grains from anther of a flower to the stigma of the same flower or another flower of the same species is known as pollination. The two modes of pollination are self pollination and cross pollination. Differences between self pollination and cross pollination are as follows:

Character	Self pollination	Cross pollination
Occurrence	Occurs within a flower or between two flowers of the same plant.	Occurs between two flowers of two different plants of the same species.
Agent of pollination	Usually no external agent of pollination is required.	External agents such as wind, water, insects and birds are required.
Production of pollen grains	Produced in small numbers, thus no wastage of pollen grains occurs.	Produced in large numbers thus, wastage of pollen grains occurs.
Appearance of flowers	Flowers are generally not attractive.	Flowers are attractive with coloured petals.
Fragrance and nectar	Commonly flowers do not produce scent or nectar.	Flowers generally produces scent and nectar.
Nature of offspring produced	Offspring produced have genetic makeup identical to the parent plant, no variation occurs.	Offspring produced may differ in genetic make-up and variations occur.

Pollination is important because it brings pollen grains to the female reproductive part (carpel) of the plant that leads to fertilisation.

62. The basic requirement for sexual reproduction is involvement of both sexes, i.e., male and female, to produce an offspring. It takes place by the combination of gametes which come from two different parents. The importance of sexual reproduction in nature are:
(i) Fusion of male and female gametes coming from two different and sexually distinct individuals, exhibit diversity of characters in offspring. provides
(ii) Meiosis during gametogenesis opportunities for new combination of genes, which leads to variation required for evolution and plays a prominent role in the origin of new species. Variations lead to the appearance of such characters, which fit to the changing environment, resulting in the survival of the species.

63. The two main steps involved in sexual reproduction are:
(i) formation of male and female gametes.
(ii) fusion of a male gamete with a female gamete to form a new cell called zygote by the process of fertilisation. The two important advantages of sexual reproduction are:

(i) It promotes diversity of characters in the offspring through genetic variations.
(ii) It plays an important role in continuous evolution of better organisms that may lead to the origin of new species.

64. In asexually reproducing organisms, only single parent is involved in reproduction. Therefore, amount of DNA remains same from parent to offspring. For example in Amoeba, whole organism divides into two daughter individuals by binary fission. Therefore, amount of DNA remain constant. In sexually reproducing organisms, reproduction take place with the help of formation of haploid gametes. Gametes are special type of cells called reproductive cells which contain only half the amount of DNA as compared to the normal body cells of an organism. So, when a male gamete combines with a female gamete during sexual reproduction, then the new cell 'zygote' will have the normal amount of DNA. For example, the human sperm has 23 chromosomes and the human egg (or ovum) has also 23 chromosomes. So, when a sperm and an egg fuse together during fertilisation, then the zygote formed will have $23 + 23 = 46$ chromosomes, which is the normal number of chromosomes.

65. In the given figure, part A is anther, part B is style and part C is ovule. Anther (A) is a part of male reproductive organ of flower called stamen. Large number of pollen grains are formed inside anther. Style (B) and ovule (C) are parts of female reproductive organ of flower called carpel / pistil. Style is a long conducting tube which gives the passage to pollen tube carrying male gametes so that it reaches ovary which contains one or more ovules. Ovules contain female gamete or egg. On fertilisation, ovary converts into fruit and ovules give rise to seeds.

66. (a) Variations arise in sexually reproducing organisms on account of the following:
(i) Genetic variations occur because DNA copying mechanism is not absolutely accurate.
(ii) Creation of new combinations of genetic variations because variations from two individuals combine during fusion of gametes.
(b) (i) A is pollen grain.
(ii) Part B is stigma. It is the part of pistil (female reproductive organ) that receives pollen grains. Pollen grains reach stigma through various agencies

like wind, water, insect, etc.
(iii) Pollen tube (C) carries male gametes to the ovule present in ovary. Male gametes fuse with egg and secondary nucleus to give rise to zygote and endosperm.
(iv) Female gamete (D) fuses with male gamete and converts to embryo after fertilisation.

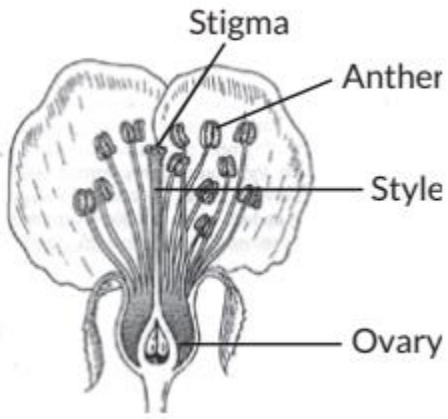
67. Sexual reproduction is the process of production of offspring by the fusion of male and female gametes. Here, haploid gametes fuse to form diploid zygote which develop into a mature organism. Significance of sexual reproduction are as follows:
(i) Sexual reproduction gives rise to genetic variations because of genetic recombination that takes place during fusion of gametes.
(ii) Progenies arising through sexual reproduction sometimes show better combination of traits and get better adapted to their surroundings.
(iii) Genetic recombination, interaction, etc., during sexual reproduction provide vigour and vitality to the offspring.
(iv) Variations in genes play an important role in evolution.

68. The reproductive parts of an angiosperm are stamen (male reproductive part) and carpel/pistil (female reproductive part). These are located in the flowers of an angiospermic plant.
A carpel is made of three parts: stigma, style and ovary. The top part of carpel is called stigma. Stigma is for receiving the pollen grains during pollination. Stigma is sticky so that pollen can stick to it. The middle part of carpel is called style. Style is a tube which connects stigma to the ovary. The swollen part at the bottom of a carpel is called ovary. The ovary contains ovules. Ovules contain the female gametes or female sex cells (egg) of the plant. There are usually many ovules in the ovary. Each ovule contains only one female gamete of the plant.

69. Six specific characteristics of sexual reproduction are as follows:
(i) Two different sexes, i.e., male and female are involved in this process.
(ii) Sexual reproduction involves formation of special sex cells called gametes.
(iii) Fusion of gametes or fertilisation takes place in the body of female (internal fertilisation) or outside (external fertilisation).
(iv) Offspring inherit traits from both parents (heredity) and also show some new traits of their own (variation), hence they are not clones of the parents.

(v) Variations in sexually reproducing organisms arises on account of crossing over during meiotic division during gamete formation.
(vi) It plays a prominent role in origin of new species as it leads to variations which accumulate over a period of time and get carried to successive generations.

70. Longitudinal section of a bisexual flower is as follows:



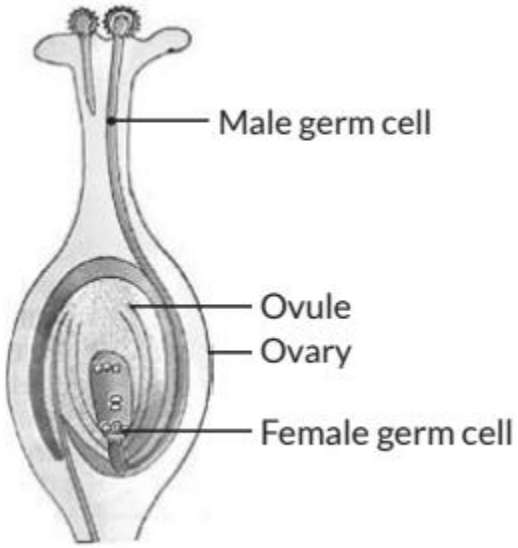
71. Difference between asexual and sexual mode of reproduction is as follows:

Asexual reproduction	Sexual reproduction
Gametes are not formed hence fertilisation does not take place.	Gametes are always formed and fertilisation takes place to form a zygote.

Species reproducing sexually have a better chance of survival as variation occurs only during the sexual reproduction. Variations are necessary for evolution and increase chances of survival in changed environmental conditions.

72. DNA copying is an essential part of the process of reproduction as it results in passing of nearly same genetic information from parents to the offsprings. DNA replication also ensures that same number of chromosomes are passed from parents to offspring. Advantages of sexual reproduction over asexual reproduction is that sexual reproduction provides variations which is a major factor for evolution that helps in survival of species in changing environment.

73. The diagram of the longitudinal section of flower is as follows:



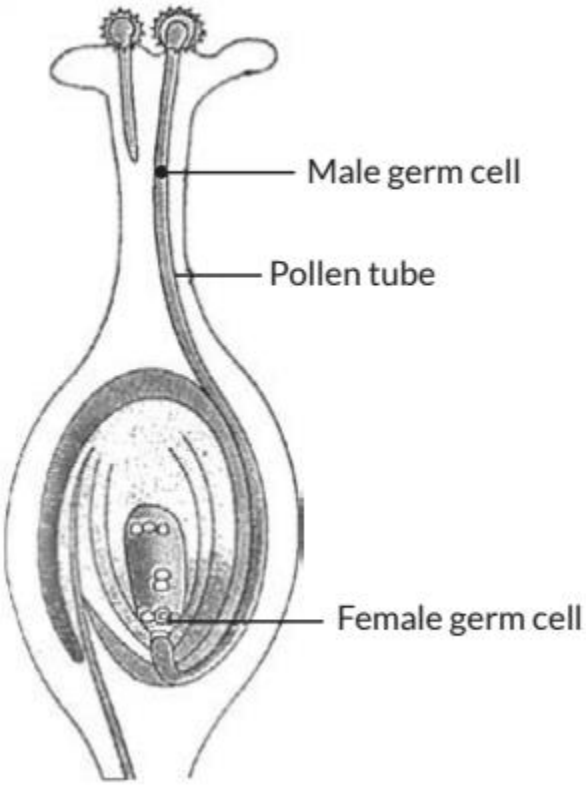
74. A carpel is made of three parts: stigma, style and ovary. The top part of carpel is called stigma. Stigma is for receiving the pollen grains during pollination. Stigma is sticky so that pollen can stick to it. The middle part of carpel is called style. Style is a tube which connects stigma to the ovary. The swollen part at the bottom of a carpel is called ovary. The ovary contains ovules. Ovules contain the female gametes or female sex cells (egg) of the plant. There are usually many ovules in the ovary.

75. The two reproductive parts of a of a bisexual flower which contain the germ cells are carpel (female reproductive part) and part) stamen (male reproductive part). Carpel is situated is situated in the centre of the flower as a flask-shaped structure. A carpel is made up of three parts-stigma, style and ovary. The distal part of a carpel is called stigma. Stigma is responsible for receiving pollen during pollination. Style is an elongated tubular structure which connects stigma with ovary. The basal swollen part of carpel is ovary. Ovary bears several ovules. After fertilisation, ovules form seeds and ovary forms the fruit.

76. (i) (1) When the Bryophyllum leaf falls on the wet soil, the buds present in the notches along the leaf margin develop into new plants. This is one of the example of vegetative propagation by leaves.
(2) When Planaria accidently cut into many pieces then its each piece grows into a complete organism. This is one of the example of regeneration.

(3) The sporangia of Rhizopus contain cells or spores that can eventually develop into new Rhizopus individuals when it bursts on maturation. Rhizopus reproduce asexually by the formation of the spores (sporulation).
(ii) After fertilization, the fertilized egg (or zygote) divides several times to form an embryo within the ovule. The ovule develops a tough coat around it and is gradually converted into a seed. The ovary of flower develops and becomes a fruit (with seeds inside it). The other parts of flower like sepals, petals, stamens, stigma and style dry up and fall off. Only the ovary is left behind. So, at the place on plant where we had a flower originally, we now have a fruit (which is the ovary of the flower containing seeds). A fruit protects its seeds.

77. Diagram showing fertilisation in a flower is as follows:



Fertilisation, in plants, occurs when the male gamete present in pollen grain fuses with the female gamete (or egg) present in ovule. When a pollen grain falls on the stigma of the carpel, it bursts open and grows a pollen tube downwards through the style towards the female gamete in the ovary. Male gametes move down the pollen tube. The pollen tube enters the ovule in the ovary. The tip of pollen tube bursts and male gametes comes out of pollen

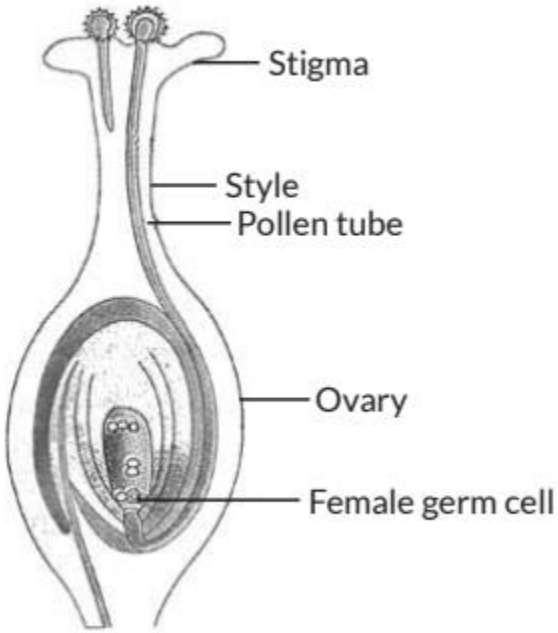
tube. In ovary, the male gamete of pollen combines with the female gamete or egg present in ovule to form a fertilised egg. After fertilisation,
(i) ovule develops into seed
(ii) ovary develops into fruit.

78. (a) (i) Hydra - Budding
(ii) Planaria Regeneration
(iii) Amoeba - Fission
(iv) Spirogyra - Fragmentation
(v) Rhizopus - Spores
(b) Refer to answer 25.
(c) Refer to answer 53.

79. The process of transfer of pollen grains from anther of a flower to the stigma of the same flower or another flower of the same species is known as pollination. Pollination may be of two major types- (i) self pollination and (ii) cross pollination.
(i) Self pollination is the transfer of pollen grains from the anther to the stigma of the same flower, or to the stigma of another flower of the same plant. This pollination generally takes place in bisexual flowers because they have both male and female gametes in them.
(ii) Cross pollination is the transfer of pollen grains from the anther of a flower of one plant to the stigma of a flower of another plant of the same species. This occurs in unisexual as well as bisexual flowers. Two agents of pollination are wind and water. Pollination results in the deposition of related pollen grains over the receptive stigma of the carpel. Pollen grains after landing on stigma, absorb water, swell and then germinate to produce pollen tubes. Many pollen tubes grow into the stigma, but only one passes through the style and then moves towards the ovary. Two non- motile male gametes are formed inside the tube during its growth through the style. After reaching the ovary, pollen tube enters the ovule through the micropyle. The tip of the tube finally pierces the micropylar end of the embryo sac. After penetration, the tip of pollen tube ruptures releasing two male gametes into the embryo sac. The mature embryo sac consists of an egg apparatus (one haploid egg and two synergids), two polar nuclei and three antipodal cells. During the act of fertilisation, one male gamete fuses with the egg to form the diploid zygote.

80. Refer to answer 61.
Fertilisation takes place in the ovary of a female flower. Inside the ovary, the ovule is fertilised by pollen. After the process of fertilisation, the ovary in the flower thickens and enlarges to form the fruit, whereas the ovule becomes the seed containing the embryo.

(b) The labelled diagram of a pistil is as follows:



81. (a) In the given diagram A is stigma, B is pollen tube, C is ovary and D is female germ cell.
(b) The process of transfer of pollen grains from the anther of a flower to the stigma of the same flower or another flower is known as pollination. Pollination is important because it brings pollen grains to the female reproductive part (carpel) of the plant that leads to fertilisation.
(c) Fertilisation, in plants, occurs when the male gamete present in pollen grain fuses with the female gamete (or egg) present in ovule. When a pollen grain falls on the stigma of the carpel, it bursts open and grows a pollen tube downwards through the style towards the female gamete in the ovary. Male gametes move down the pollen tube. The pollen tube enters the ovule in the ovary. The tip of pollen tube bursts and male gametes comes out of pollen tube. In ovary, the male gamete of pollen combines with the female gamete or egg present in ovule to form a fertilised egg. After fertilisation,

(i) ovule develops into seed
(ii) ovary develops into fruit.

82. (a) A represents pollen grains, B represents pollen tubes, C represents ovary and D represents female germ cell.
(b) Refer to answer 81 (b).
(c) Refer to answer 81 (c).

83. (a) Unisexual flowers bear organs of only one sex, i.e., either stamen or pistil, e.g., papaya. Bisexual flowers contain both stamen and pistil, e.g., Hibiscus.
(b) After fertilisation, the fertilised egg (or zygote) divides several times to form an embryo within the ovule. The ovule develops a tough coat around it and is gradually converted into a seed. The ovary of flower develops and becomes a fruit (with seeds inside it). The other parts of flower like sepals, petals, stamens, stigma and style dry up and fall off. Only the ovary is left behind. So, at the place on plant where we had a flower originally, we now have a fruit (which is the ovary of the flower containing seeds). A fruit protects the seeds.
(c) Refer to answer 64.

84. (b)

85. (d): Female reproductive system consists of ovaries, oviducts, uterus and vagina. The seminal vesicles are the pair of glands found in male reproductive system.

86. (a): Sperm formation requires 2-2.5°C lower temperature than the normal internal body temperature, so testes are located outside the abdominal cavity in the scrotum.

87. Two functions of ovary of human female are:
(i) production of female gametes, i.e., ova
(ii) secretion of female hormones, i.e., estrogen and progesterone.

88. (i) Placenta is a special tissue by means of which embryo gets nutrition from the mother's blood. The villi present in placenta provides larger surface area for glucose and oxygen to pass from the mother's blood to the embryo. Also, the waste generated by the developing embryo is removed by transferring them into the mother's blood through placenta. Hence, placenta is

extremely essential for fetal development.
(ii) The uterine lining becomes thick after fertilisation and is richly supplied with blood to nourish the growing embryo.

89. Puberty is the age of human males and females at which the reproductive organs become functional, gonads start producing gametes and sex hormones, and the boys and the girls become sexually mature. Changes that are common to both boys and girls in early teenage years are as follows:
(i) Hair grows in the pubic area and armpits
(ii) Increase in height and acquisition of muscle mass.

90. Testes are the primary reproductive organs in males. Testes produce male gametes (sperms) and male sex hormones (testosterone).

91. The main difference between sperms and eggs of humans is that a sperm has X or Y chromosome whereas egg has a pair of X chromosome. This helps in determination of the sex of a person and maintaining the genetic continuity in the organisms.

92. The two preparations shown every month by the uterus in anticipation of pregnancy in humans are:
(i) The wall of uterus becomes thick to receive the fertilised egg.
(ii) The uterine wall is richly supplied with blood to nourish the growing embryo.

93. Placenta is an intimate connection between fetus and uterine wall of the mother to exchange the materials. It is a disc shaped structure embedded in the uterine wall. It contains villi on embryo's side and blood spaces towards mother's side. Blood spaces surround villi. Placenta performs the following functions:
(i) All nutritive elements from maternal blood pass into the fetus through it.
(ii) Placenta helps in respiration, i.e., supply of oxygen and removal of CO_2 from fetus to maternal blood.
(iii) Fetal excretory products diffuse out into maternal blood through placenta and are excreted by mother.
(iv) Placenta also secretes hormone.

94. A chromosome is a long DNA molecule found in nucleus with part on all of genetic material. The amount of DNA remain constant in each new generation

because of formation of haploid gametes. Gametes are special type of cells called reproductive cells which contain only half the amount of DNA as compared to the normal body cells of an organism. So, when a male gamete combines with a female gamete during sexual reproduction, then the new cell 'zygote' will have the normal amount of DNA. For example, the human sperm has 23 chromosomes and the human egg (or ovum) has also 23 chromosomes. So, when a sperm and an egg fuse together during fertilisation, then the zygote formed will have $23 + 23 = 46$ chromosomes, which is the normal number of chromosomes.

95. (a) The secretions of seminal vesicles and prostate gland provides nutrition to the human sperms and also make their further transport easier. The genetic constitution of a 50% sperm have X chromosome and 50% have Y chromosome.
(b) (i) XX - Female child
(ii) XY - Male child

96. (a) Implantation is the close attachment of the blastocyst (young multicellular embryo) to the uterine wall. It is followed by a number of developmental changes in the thickened wall of uterus. An intimate connection between the fetal membrane and the uterine wall called placenta is formed. This is a disc which is embedded in the uterine wall. The placenta serves as the nutritive, respiratory and excretory organ of the fetus.
(b) When the female gamete/egg is not fertilised, this lining is not needed any longer. So, the lining slowly breaks and comes out through vagina as blood and mucus. This cycle takes place every month and is known as menstrual cycle.

97. Testes, in human males, are the primary reproductive organs. They are the site of sperm formation. The testes also produce male sex hormone testosterone. Testes are located outside the abdominal cavity because sperm formation requires a lower temperature than normal body temperature. The temperature of the testes in the scrotum is about 2-2.5°C lower than normal body temperature. This temperature is ideal for sperm formation and development. Hormone testosterone brings about the development of secondary sexual characters during puberty in boys like growth of facial hair, deepening of voice, growth of scrotum and penis, accumulation of muscle mass, etc., and also regulates formation of sperms.

98. (a) (i) Testes: The two testes in male are the sites where male gametes, i.e., sperms are formed. Testes also produce the male sex hormone called testosterone.
(ii) Scrotum : The scrotum is a pouch of skin that lie outside abdominal cavity. The two testes lie in respective scrotal sacs. The scrotum acts as a thermoregulator and provides an optimal temperature for the formation of sperms.
(iii) Vas deferens: This is a straight tube, about 40 cm long, which carries the sperms to the seminal vesicles, where mucus and a watery alkaline fluid containing fructose, mix with the sperms.
(iv) Prostate gland: It is a single large gland that surrounds the urethra and produces a milky, slightly acidic secretion. Secretion of prostate gland nourishes and activates the sperm to swim.
(b) Two roles of testosterone are:
(i) It plays a key role in development of male secondary sex organs such as prostate, etc.
(ii) It promotes the secondary sexual characteristics in males such as increased muscle and bone mass, growth of body hair, etc.

99. The parts of a flower which serve the same function as following do in the animals are
(i) testes - anther of stamen
(ii) sperm - pollen grain
(iii) ovary - ovary of pistil
(iv) egg - female germ cell present in ovule.

100. (a) (i) The ovaries in female are primary sex organs (or female gonads) which perform the dual function - production of female gametes (eggs or ova) and secretion of female sex hormones (estrogen and progesterone).
(ii) Oviducts or fallopian tube are paired tubes originating near the ovaries of their respective sides and extend upto uterus. The terminal part of fallopian tube is funnel-shaped with finger-like projections called fimbriae lying near ovary. Fimbriae pick up the ovum released from ovary and push it into fallopian tube. Fertilisation also takes place in the oviduct.
(b) (i) As the ovary releases one egg every month, the uterus also prepares itself, every month to receive fertilised egg by making its lining thick and spongy to nourish the zygote if fertilisation takes place.

(ii) When the female gamete/egg is not fertilised, this lining is not needed any longer. So, the lining slowly breaks and comes out through vagina as blood and mucus through menstrual cycle that takes place every month.
(c) Placenta performs the following functions:
(i) All nutritive elements from maternal blood pass into the fetus through it.
(ii) Placenta helps in respiration i.e., supply of oxygen and removal of CO_2 from fetus to maternal blood.
(iii) Fetal excretory products diffuse out into maternal blood through placenta and are excreted by mother.
(iv) Placenta also secretes various hormones during pregnancy.

101. (a) The age at which the sex hormones begin to be produce and the boy and girl becomes sexually mature, i.e., able to reproduce is called puberty.
(b) (i) Testes: The two testes in male are the sites where male gametes, i.e., sperms are formed. Testes also produce the male sex hormone called testosterone.
(ii) Seminal vesicles: Seminal vesicles are one pair of sac-like structures near the base of bladder. Seminal fluid is a watery alkaline fluid that contains nutrients (fructose) which serve as a source of energy for the sperm. Each seminal vesicle releases its contents into the ejaculatory duct during ejaculation.
(iii) Vas deferens: This is a straight tube, about 40 cm long, which carries the sperms to the seminal vesicles, where mucus and a watery alkaline fluid containing fructose, mix with the sperms.
(iv) Urethra : It is a long tube that arises from urinary bladder. Urethra carries urine from the bladder as well as sperms from the vas deferens, through the penis.
(c) Testes are located outside the abdominal cavity because sperm formation requires a lower temperature than normal body temperature. The temperature of the testes in the scrotum is about 2-2.5°C lower than normal body temperature. This temperature is ideal for sperm formation and development.
(d) The sperms present in the testes of man are introduced into the vagina of the woman through penis during copulation. Millions of sperms are released into the vagina at one time. The sperms are highly active and mobile. They travel from here upward through the uterus at the top of fallopian tube within five minutes.

102. (a) A - Ureter
B - Seminal vesicle
C - Urethra
D - Vas deferens

(b) Testes produce male sex hormone testosterone. Hormone testosterone brings about the development of secondary sexual characters during puberty in boys like growth of facial hair, deepening of voice, build up of muscle mass and also regulates formation of sperms.
(c) Seminal vesicles (B) release its contents into the ejaculatory duct during ejaculation. Urethra (C) carries sperms from the vas deferens through the penis.

103. (a) Function of human female reproductive part are as follows:
(i) Ovary: The ovaries are primary sex organs (or female gonads), which perform the dual function:
- Production of female gametes (eggs or ova)
- Secretion of female sex hormones (estrogen and progesterone).
(ii) Oviduct (Fallopian tube): It is a site where egg and sperms meet and fertilisation takes place. It also conducts the ovum or zygote towards uterus by ciliary action.
(iii) Uterus It is the site of implantation, placentation and fetal development. It's muscular wall helps in expelling of baby during childbirth.
(b) Placenta is an intimate mechanical and physiological connection between fetus and uterine wall of the mother. It is a disc shaped structure embedded in the uterine wall. It contains chorion having villi on the embryo's side and blood spaces towards mother's side. Blood spaces surround the villi. Placenta is connected to the fetus by umbilical cord. Placenta performs the following functions:
(i) All nutritive elements from maternal blood passes into the fetus through it.
(ii) Placenta helps in respiration, i.e., supply of O_2 to the fetus and removal of CO_2 from fetus to maternal blood.
(iii) Fetal excretory products diffuse out into maternal blood through placenta and are excreted by mother.
(iv) Placenta also secretes hormones.
(v) Placenta acts as a barrier between mother and fetus blood and only allows necessary materials to pass through it.

104.(a) Testes: The two testes in male are the sites where male gametes, i.e., sperms are formed. Testes als produce the male sex hormone called testosterone. Two roles of testosterone are:
(i) It plays a key role in development of male secondary sex organs such as prostate, etc.
(ii) It promotes the secondary sexual characteristics in males such as increased muscle and bone mass, growth of body hair, etc.
(b) In human female, the fertilisation occurs in the oviducts or fallopian tube.
(c) The developing embryo gets nourishment from the mother's blood with the help of a special tissue called placenta. This is a disc like structure embedded in uterine wall. It contains villi that provides a large surface area to pass glucose and oxygen from mother to embryo.
105.Refer to answer 103 (b).

106. (a) Refer to answer 103 (a).
(b) Menstruation is the cyclic discharge of blood along with endometrial lining of the uterus and unfertilised egg in women. It last for 3-5 days. After the release of egg in the females, the uterine lining becomes thickened for the implantation of fertilised egg or zygote. In the absence of fertilisation, the egg along with endometrial lining is expelled out of the body in the form of menstruation.

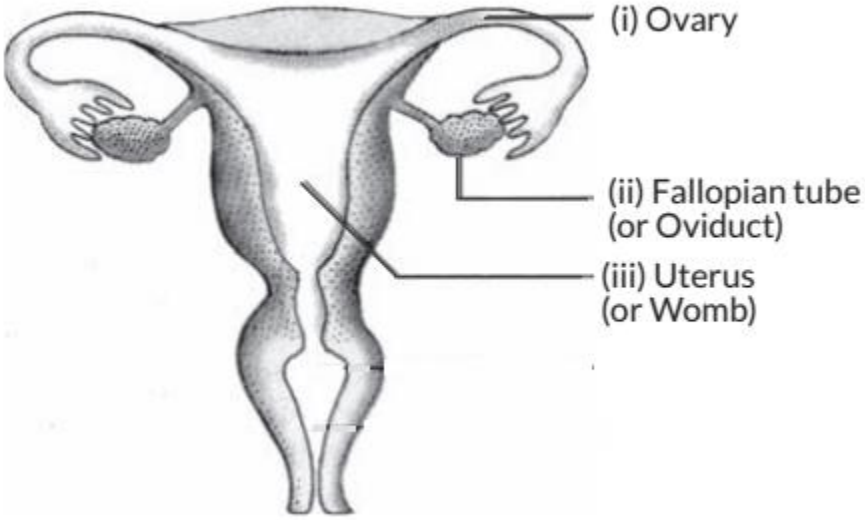
107. Refer to answer 103(a).
The developing embryo gets nourishment from the mother's blood with the help of a special tissue called placenta. This is a disc like structure embedded in uterine wall. It contains villi that provides a large surface area to pass glucose and oxygen from mother to embryo.

108. (a) Testes: The two testes in male are the sites where male gametes, i.e., sperms are formed. Testes also produce the male sex hormone called testosterone. Two roles of testosterone are:
(i) It plays a key role in development of male secondary sex organs such as prostate, etc.
(ii) It promotes the secondary sexual characteristics in males such as increased muscle and bone mass, growth of body hair, etc.
(b) (i) In human female the fertilisation occurs in the oviducts or fallopian tube.
(ii) Implantation of the fertilised egg occurs in uterus. The developing embryo

gets nourishment from the mother's blood with the help of a special tissue called placenta. This is a disc like structure embedded in uterine wall. It contains villi that provides a large surface area to pass glucose and oxygen from mother to embryo. Placenta links the embryo to the mother through umbilical cord.

109. (a) (i) Ovary produces egg or ova.
(ii) The fusion of sperm and egg occurs in oviduct or fallopian tube.
(iii) The zygote gets implanted in the uterus.
(b) After implantation of zygote or embryo in the thick lining of the uterus, a disc-like special tissue develops between the uterus wall and the embryo, which is called as placenta. Placenta meets all the requirements for developing the fetus like nutrition, respiration, excretion, etc. When fetus (embryo) develops completely, the rhythmic contraction of uterus muscles gradually pushes the baby out of the mother's body through vagina.

110. (a) The sectional view of human female reproductive system is as follows:



(b) (i) When the ovum (or egg) is fertilised in the oviduct, then a zygote is formed. The uterus prepares itself every month to receive a zygote. The inner lining of uterus becomes thick and spongy with lot of blood capillaries in it. This would be required for nourishment and further development of embryo.
(ii) If a sperm is not available at the time of ovulation,
then fertilisation of ovum does not take place. Since the ovum (or egg) is not fertilised, so the thick and soft uterus lining having lot of blood capillaries in it

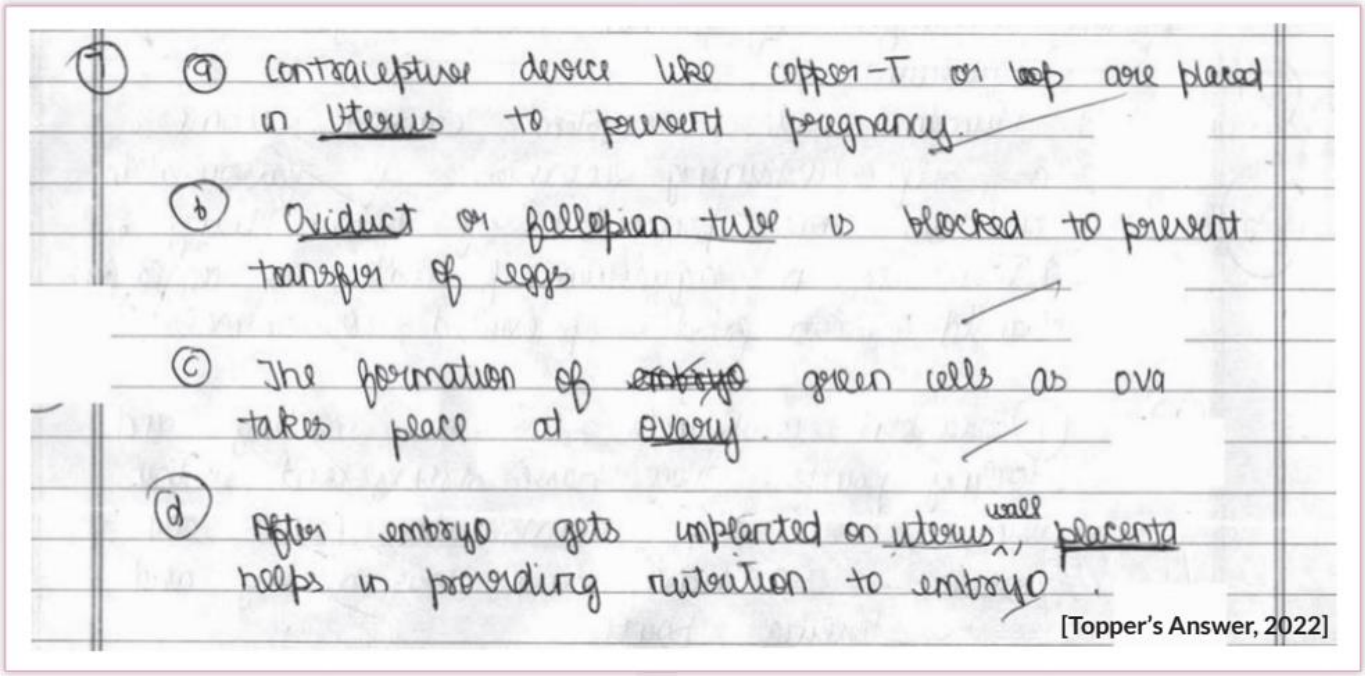
which is not required. The unfertilised ovum dies within a day and the uterus lining also breaks down. The breakdown and removal of the inner, thick and soft lining of the uterus alongwith its blood vessels in the form of vaginal bleeding called menstrual flow or menstruation.

111. (d): Among sexually transmitted infections, bacterial infections are gonorrhoea and syphilis whereas viral infections are warts and HIV-AIDS. Syphilis is caused by bacterium Treponema pallidum. Warts is caused by Human papilloma virus (HPV).

112. (d): In males, blockage of vas deferens is called vasectomy which prevents the sperms to getting into the semen.

113. The diseases that are spread by sexual contact with infected person are called sexually transmitted diseases (STDs), e.g., AIDS, gonorrhoea.

114.



115. (a) (i) Vasectomy is a small surgical operation performed in males. It involves removal of a small portion of the sperm duct (or vas deferens) by surgical operation. The two cut ends are then ligated (tied) with threads and this prevents the sperms from coming out.
(ii) Tubectomy is done in females where oviducts are cut and tied with threads and therefore, passage of ova is prevented.
(b) Oral pills inhibit ovulation. These are mainly hormonal preparations which

contain estrogen and progesterone. These hormones inhibit development of egg and ovulation.

116. The diseases that are spread by sexual contact with an infected person are called sexually transmitted disease (STDs).
(i) Bacterial infection causes gonorrhoea, syphilis.
(ii) Viral infection causes AIDS, genital herpes. STDs can be prevented by using male and female condoms.

117. Methods developed to prevent pregnancy are:
(i) barrier method, i.e., use of condoms, diaphragm, etc.
(ii) oral contraceptive method, i.e., use of oral pills.
(iii) surgical method, i.e., vasectomy and tubectomy. Out of these methods, chemical method is not meant for males. Use of these techniques help to keep control over number of children in a family, which directly affects prosperity of a family. One of the most common reason for deterioration of women's health is frequent conception. Controlled childbirth will directly affect women health and this will indirectly affect the prosperity of family and nation.

118. The four methods of birth control which deliberately prevent fertilisation in humans are:
(i) Barrier method- These are physical devices to prevent the entry of sperm in the female, e.g., condoms. It is a mechanical barrier which does not allow sperms and ovum to meet, hence prevents fertilisation.
(ii) Chemical method - It involves the use of oral pills that check ovulation. These are mainly hormonal preparations and contain estrogen and progesterone.
(iii) Intrauterine contraceptive device-These devices are implemented into uterus, e.g., copper - T. They increase phagocytosis of sperms within uterus and suppress sperm motility and its fertilising capacity. They also make uterus unsuitable for implantation and cervix hostile to sperms.
(iv) Surgical methods: These methods involves removal of a small portion of vas deferens in males or fallopian tube in females to prevent transport of gametes. (any three) properly. Contraception prevents frequent pregnancies and sexually transmitted diseases thus, supports good health and prosperity of a family.

119. The general awareness regarding reproductive health in a society is significant as :
(i) Maintenance of personal hygiene among youngsters and proper knowledge of their reproductive parts helps them adjust with the physical changes and cope with emotional disturbances.
(ii) Reproductively healthy society must be free from the curse of child marriage which begets many complications at the level of individual and society both.
(iii) Proper care of expecting mothers, monitoring their health after child birth and care of new born help in building a healthy society.
(iv) Married couples aware of contraceptive methods lead a better married life as they are capable of avoiding unwanted pregnancies and have negligible chances of contracting sexually transmitted diseases. In past 50 years, various areas related to reproductive health have been launched which have improved the reproductive health of our society in following ways: Two of them are:
(i) reduced mortality rate of mother and infant
(ii) birth control due to easily available contraceptive and reduced STDs cases.

120. Refer to answer 118.

121. (a) The two advantages of imposing ban on prenatal sex determination are:
(i) check on female feticide
(ii) improving sex ratio in the country.
(b) Students should educate the society as
(i) female feticide is reducing the number of girls drastically in some societies. For a healthy society, the male-female sex ratio must be maintained at almost the same level. Due to reckless female feticide, the male- female child sex ratio is declining at an alarming rate in some sections of our society.
(ii) Children in a small family can be provided with all the resources from education, good amenities like food, clothing and healthy lifestyle. As the family grows larger, the resources should be shared with increased number of member. Having fewer children also keeps the mother in good health. Key Points India was the first country to adopt family planning as the government sponsored programme in 1951.

122. (i) Testes, in human males, are the primary reproductive organs. They are located outside the abdominal cavity in scrotum because sperm formation

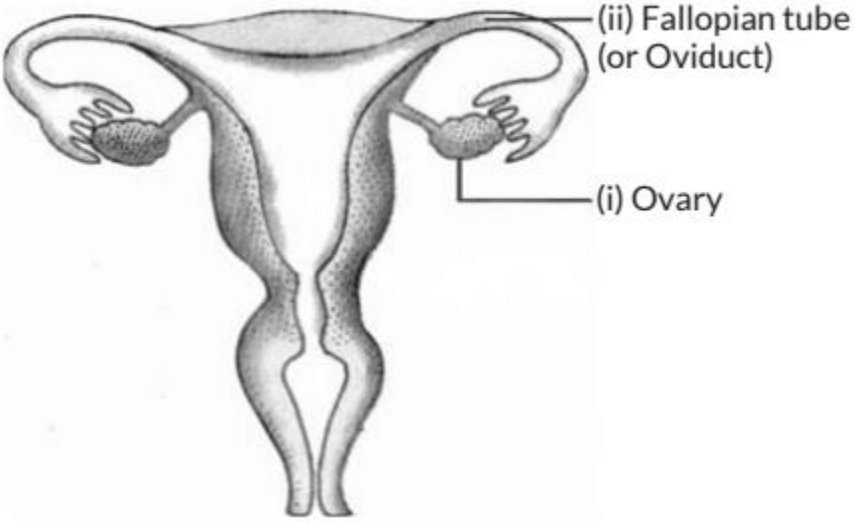
requires a lower temperature than normal body temperature. The temperature of the testes in the scortum is about 2-2.5°C lower than normal body temperature. This temperature is ideal for sperm formation and development. Testes are the site of sperm formation. The testes also produce male sex hormone testosterone.
(ii) (1) When the ovum (or egg) is fertilized in the oviduct, then a zygote is formed. The uterus prepares itself every month to receive a zygote. The inner lining of uterus becomes thick and spongy with lot of blood capillaries in it. This would be required for nourishment and further development of embryo.
(2) The fertilisation of ovum does not take place, if a sperm is not available at the time of ovulation. The unfertilised ovum dies within a day and the uterus lining also breaks down. The breakdown and removal of the inner, thick and soft lining of the uterus along with its blood vessels in the form of vaginal bleeding is called menstrual flow or menstruation.
(iii) Surgical methods are most effective methods of contraception. Surgical methods include vasectomy and tubectomy. Vasectomy is a small surgical operation performed in males. It involves removal of a small portion of the sperm duct (or vas deferens) by surgical operation. The two cut ends are then ligated (tied) with threads and this prevents the sperm from coming out. Tubectomy is done in females where oviducts are cut and cut ends are tied with threads and therefore, passage of ova is prevented.

123. (i) Two common signs of sexual maturation in boys and girls are:
(a) Growth of pubic hair and extra hair in the armpits.
(b) Development of oily skin and pimples.
(ii) Female feticide is reducing the number of girls drastically in our country, due to which male-female sex ratio is also declining.
(iii) Chemical contraceptive method changes the hormonal balance of the body.
(iv) The rate of birth and death in a given population will determine the size of a population.

124. (a) Three different categories of contraceptive methods are:
(i) Barrier methods, i.e., use of condoms, etc.
(ii) Oral contraceptive methods, i.e., use of oral pills etc.
(iii) Surgical methods, i.e., vasectomy and tubectomy.
(b) Prenatal sex determination was banned in India in 1994. This was done to

prevent sex selective abortion. It is being used to kill the normal female fetus. This killing of the unborn girl child is called female feticide which is reducing the number of girls drastically in some societies of our country. Due to reckless female feticide, male-female sex ratio is declining at an alarming rate. Its benefit in the long run is that the female-male ratio could be maintained for a healthy society.
(c) Bacterial diseases due to unsafe sex are gonorrhoea and syphilis. Viral diseases due to unsafe sex are AIDS and genital herpes.

125. (a) Two categories of contraceptive methods used to control the size of human population are:
(i) Barrier method- These are physical devices to prevent the entry of sperm in the female, e.g., condoms.
(ii) Chemical method - It involves the use of oral pills that check ovulation. These are mainly hormonal preparations and contain estrogen and progesterone.
(b) Refer to answer 124 (c).
(c) Advantages of condom during sexual act:
(i) Condom act as a mechanical barrier and prevent the entry of sperms in the female reproductive tract. Thus, It act as a contraceptive method and prevent unwanted pregnancy.
(ii) Condom also protect against sexually transmitted diseases (STDs).



126. (a) The given diagram is the sectional view of human female reproductive system. The labelled parts are:

127. Funnel of fallopian tube or oviduct

128. Ovary

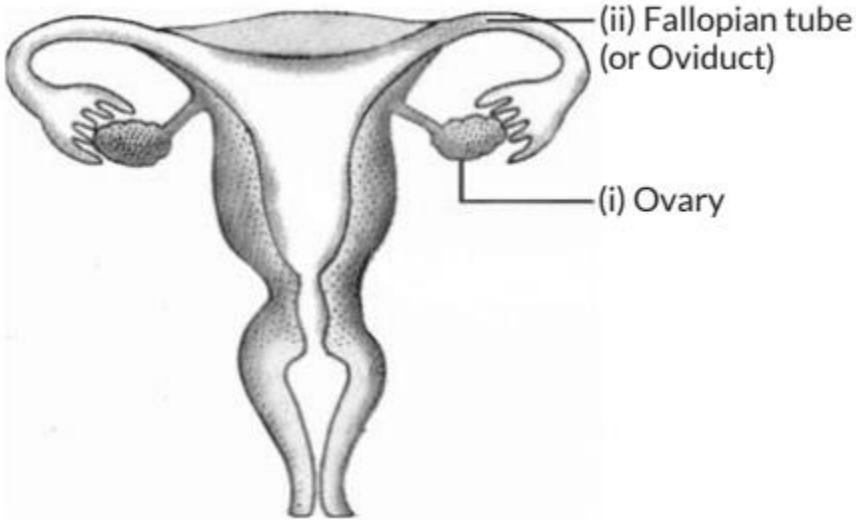
129. Uterus or womb

130. Cervix

131. Vagina

(b) Contraception is the avoidance of pregnancy. Three advantages of adopting contraceptive methods are:
(i) They prevent frequent or unwanted pregnancies.
(ii) They prevent the transfer of sexually transmitted infections.
(iii) They help to regulate the population growth.

127. (a) The sectional sectional view of human female reproductive system is as follows:



(b) Gonorrhoea and syphilis are two bacterial diseases which are transmitted sexually.
(c) Contraceptive devices are those devices which are used to prevent pregnancy. It includes diaphragm, condom and intrauterine devices.
Contraceptive methods are adopted:

(i) to avoid unwanted birth.
(ii) to keep the population of a country under control.

CBSE Sample Questions

1. (a) The greenish black powdery mass on a stale piece of bread is due to the growth of bread mould fungus (Rhizopus) which reproduce by the method of spore formation. (1)
(b) Rhizopus possess thread-like projections called hyphae (vegetative structure) from which small spherical structure called sporangium (reproductive structure) is developed. (1)

2. (b): The given diagram shows two different types of pollination. A and C are showing self pollination, so variation does not occur here, while B and D is showing cross pollination that leads to variation in the next progeny. (1)

3. In field A, the parental traits seen in consecutive generations of the offspring is due to self-pollination because self pollination maintained parental characteristics in the offspring whereas in field B, where majority of the offsprings showed a variation in progeny due to the occurrence of cross-pollination because in cross-pollination, genetic diversity is introduced within the various species of same plant. (2)

4. Stamen is the male reproductive part and it produces pollen grains. Carpel is the female reproductive part of the flower having basal swollen ovary. The ovary contains ovules and each ovule has an egg cell. (1)
For the formation of seeds, pollen grains need to be transferred from the stamen to the stigma. If this transfer of pollen occurs in the same flower, it is referred to as self-pollination. On the other hand, if the pollen is transferred from one flower to another, it is known as cross-pollination. (1)
After the pollen lands on a suitable stigma, it has to reach the female germ-cells which are in the ovary. For this, a tube grows out of the pollen grain and travels through the style to reach the ovary. Two male gametes are formed in pollen tube which appears due to the germination of pollen grain. Pollen grain undergoes only two mitotic divisions and give rise to vegetative cell and generative cell. (1)
The male germ-cell produced by pollen grain fuses with the female gamete present in the ovule. This fusion of the germ-cells called fertilisation gives the zygote. (1)
After fertilisation, the zygote divides several times to form an embryo within

the ovule. The ovule develops a tough coat and is gradually converted into a seed. The Ovary grows rapidly and ripens to form a fruit. Meanwhile, the petals, sepals, stamens, style and stigma may shrivel and fall off. (1)

5. (a) A male gamete follows the following path to fertilise a female gamete after being released from the penis:

Sperm → Enter into the vagina → Uterus → Fallopian tube (Fertilisation takes place) → Zygote (2n) **(1)**

(b) A zygote is formed by the fusion of two sets of gametes i.e.,(n) from male parent and (n) from female parent. Therefore, it will have two sets of chromosomes (2n). (1)

6. (a) Many multicellular organisms are not simply a random collection of cells. Specialised cells are organised as tissues, and tissues are organised into organs, which then have to be placed at definite positions in the body. Therefore, cell-by-cell division (i.e., asexual) to form various types of cells with different structures and functions would be impractical in complex multicellular organisms. (2)

(b) Sexual maturation of reproductive tissues is a necessary link for reproduction because of the need for specialised cell called germ-cells to participate in sexual reproduction. The germ-cells are produced only in mature reproductive tissues. The body of the individual organism has to grow into its adult size. When the rate of general body growth begins to slow down, reproductive tissues begin to mature. If humans have to participate in the process of mating, their state of sexual maturity must be identifiable by other individuals. Some changes taking place are different in boys and girls. In girls, breast size begins to increase, with darkening of the skin of the nipples. Girls also begin to menstruate during puberty. Boys begin to have new thick hair growth on the face and their voices begin to crack. The actual transfer of germ-cells between two people needs special organs for the sexual act, such as in males, penis when it is capable of becoming erect and release of ovum from ovary in females. (3)

7. (a) If the niches are drastically altered, the population could be wiped out due to the population's inability to suddenly adapt to the changes. Variation is

thus, useful for the survival of species over time. (12)
(b) After fertilisation and formation of the embryo, the uterus is prepared to receive the embryo and to support the development of the fetus. The lining of the uterus thickens and is richly supplied with blood to nourish the growing embryo. The embryo gets nutrition from the mother's blood with the help of placenta. It 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 developing embryo will also generate waste substances which can be removed by transferring them into the mother's blood through the placenta. The child is born as a result of rhythmic contractions of the muscles in the uterus. (32)