CHAPTER 1

REPRODUCTION IN ORGANISMS

MULTIPLE-CHOICE QUESTIONS

1. A few statements describing certain features of reproduction are given below:
   i. Gametic fusion takes place
   ii. Transfer of genetic material takes place
   iii. Reduction division takes place
   iv. Progeny have some resemblance with parents
   Select the options that are true for both asexual and sexual reproduction from the options given below:
   (a) i and ii; (b) ii and iii; (c) ii and iv; (d) i and iii.

2. The term 'clone' cannot be applied to offspring formed by sexual reproduction because:
   a. Offspring do not possess exact copies of parental DNA
   b. DNA of only one parent is copied and passed on to the offspring
   c. Offspring are formed at different times
   d. DNA of parent and offspring are completely different.

3. Asexual method of reproduction by binary fission is common to which of the following?
   i. Some eukaryotes
   ii. All eukaryotes
   iii. Some prokaryotes
   iv. All prokaryotes
   Choose the correct option from the following:
   (a) i and ii; (b) ii and iii; (c) i and iii; (d) iii and iv.

4. A few statements with regard to sexual reproduction are given below:
   i. Sexual reproduction does not always require two individuals
   ii. Sexual reproduction generally involves gametic fusion
   iii. Meiosis never occurs during sexual reproduction
   iv. External fertilisation is a rule during sexual reproduction

Choose the correct statements from the options below:
(a) i and iv (b) i and ii (c) ii and iii (d) i and iv

5. A multicellular, filamentous alga exhibits a type of sexual life cycle in which the meiotic division occurs after the formation of zygote. The adult filament of this alga has
   a. haploid vegetative cells and diploid gametangia
   b. diploid vegetative cells and diploid gametangia
   c. diploid vegetative cells and haploid gametangia
   d. haploid vegetative cells and haploid gametangia.

6. The male gametes of rice plant have 12 chromosomes in their nucleus. The chromosome number in the female gamete, zygote and the cells of the seedling will be, respectively,
   a. 12, 24, 12
   b. 24, 12, 12
   c. 12, 24, 24
   d. 24, 12, 24.

7. Given below are a few statements related to external fertilization. Choose the correct statements.
   i. The male and female gametes are formed and released simultaneously
   ii. Only a few gametes are released into the medium
   iii. Water is the medium in a majority of organisms exhibiting external fertilization
   iv. Offspring formed as a result of external fertilization have better chance of survival than those formed inside an organism
   (a) iii and iv (b) i and iii (c) ii and iv (d) i and iv

8. The statements given below describe certain features that are observed in the pistil of flowers.
   i. Pistil may produce more than one seed
   ii. Each carpel may have more than one ovule
   iii. Each carpel has only one ovule
   iv. Pistil have only one carpel
   Choose the statements that are true from the options below:
   (a) i and ii (b) i and iii (c) ii and iv (d) iii and iv

9. Which of the following situations correctly describe the similarity between an angiosperm egg and a human egg?
   i. Eggs of both are formed only once in a lifetime
   ii. Both the angiosperm egg and human egg are stationary

iii. Both the angiosperm egg and human egg are mobile
iv. Syngamy in both results in the formation of zygote
Choose the correct answer from the options given below:
(a) ii and iv (b) iv only (c) iii and iv (d) i and iv

10. Appearance of vegetative propagules from the nodes of plants such as sugarcane and ginger is mainly because:
a. Nodes are shorter than internodes
b. Nodes have meristematic cells
c. Nodes are located near the soil
d. Nodes have non-photosynthetic cells

11. Which of the following statements, support the view that elaborate sexual reproductive process appeared much later in the organic evolution.
i. Lower groups of organisms have simpler body design
ii. Asexual reproduction is common in lower groups
iii. Asexual reproduction is common in higher groups of organisms
iv. The high incidence of sexual reproduction in angiosperms and vertebrates
Choose the correct answer from the options given below:
(a) i, ii and iii; (b) i, iii and iv (c) i, ii and iv (d) ii, iii and iv

12. Offspring formed by sexual reproduction exhibit more variation than those formed by Asexual reproduction because:
a. Sexual reproduction is a lengthy process
b. Gametes of parents have qualitatively different genetic composition
c. Genetic material comes from parents of two different species
d. Greater amount of DNA is involved in sexual reproduction.

13. Choose the correct statement from amongst the following:
a. Dioecious (hermaphrodite) organisms are seen only in animals
b. Dioecious organisms are seen only in plants
c. Dioecious organisms are seen in both plants and animals
d. Dioecious organisms are seen only in vertebrates

14. There is no natural death in single celled organisms like *Amoeba* and bacteria because:
a. They cannot reproduce sexually
b. They reproduce by binary fission
c. Parental body is distributed among the offspring
d. They are microscopic

15. There are various types of reproduction. The type of reproduction adopted by an organism depends on:
    a. The habitat and morphology of the organism
    b. Morphology of the organism
    c. Morphology and physiology of the organism
    d. The organism's habitat, physiology and genetic makeup

16. Identify the incorrect statement.
    a. In asexual reproduction, the offspring produced are morphologically and genetically identical to the parent
    b. Zoospores are sexual reproductive structures
    c. In asexual reproduction, a single parent produces offspring with or without the formation of gametes
    d. Conidia are asexual structures in *Penicillium*

17. Which of the following is a post-fertilisation event in flowering plants?
    a. Transfer of pollen grains
    b. Embryo development
    c. Formation of flower
    d. Formation of pollen grains

18. The number of chromosomes in the shoot tip cells of a maize plant is 20. The number of chromosomes in the microspore mother cells of the same plant shall be:
    a. 20
    b. 10
    c. 40
    d. 15

VERY SHORT ANSWER TYPE QUESTIONS

1. Mention two inherent characteristics of *Amoeba* and yeast that enable them to reproduce asexually.
2. Why do we refer to offspring formed by asexual method of reproduction as clones?
3. Although potato tuber is an underground part, it is considered as a stem. Give two reasons.

4. Between an annual and a perennial plant, which one has a shorter juvenile phase? Give one reason.

5. Rearrange the following events of sexual reproduction in the sequence in which they occur in a flowering plant:

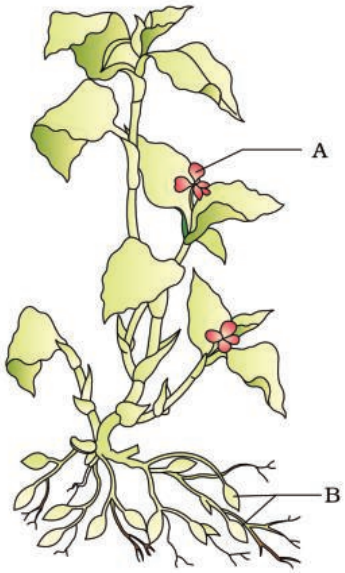
   embryogenesis, fertilisation, gametogenesis, pollination.

6. The probability of fruit set in a self-pollinated bisexual flower of a plant is far greater than a dioecious plant. Explain.

7. Is the presence of large number of chromosomes in an organism a hindrance to sexual reproduction? Justify your answer by giving suitable reasons.

8. Is there a relationship between the size of an organism and its life span? Give two examples in support of your answer.

9. In the figure given below the plant bears two different types of flowers marked 'A' and 'B'. Identify the types of flowers and state the type of pollination that will occur in them.



10. Give reasons as to why cell division cannot be a type of reproduction in multicellular organisms.

11. In the figure given below, mark the ovule and pericarp.



12. Why do gametes produced in large numbers in organisms exhibit external fertilisation?

13. Which of the followings are monoecious and dioecious organisms.

a. Earthworm _____
b. *Chara* _____
c. *Marchantia* _____
d. Cockroach _____

14. Match the organisms given in Column-'A' with the vegetative propagules given in column 'B'.

	Col. A		**Col. B**
i.	Bryophyllum	a)	offset
ii.	Agave	b)	eyes
iii.	Potato	c)	leaf buds
iv.	Water hyacinth	d)	bulbils

15. What do the following parts of a flower develop into after fertilisation?

a. Ovary _____
b. Ovules _____

SHORT ANSWER TYPE QUESTIONS

1. In haploid organisms that undergo sexual reproduction, name the stage in the life cycle when meiosis occurs. Give reasons for your answer.

2. The number of taxa exhibiting asexual reproduction is drastically reduced in higher plants (angiosperms) and higher animals (vertebrates) as compared with lower groups of plants and animals. Analyse the possible reasons for this situation.

3. Honeybees produce their young ones only by sexual reproduction. Inspite of this, in a colony of bees we find both haploid and diploid individuals. Name the haploid and diploid individuals in the colony and analyse the reasons behind their formation.
4. With which type of reproduction do we associate the reduction division? Analyse the reasons for it.
5. Is it possible to consider vegetative propagation observed in certain plants like *Bryophyllum*, water hyacinth, ginger etc., as a type of asexual reproduction? Give two/three reasons.
6. 'Fertilisation is not an obligatory event for fruit production in certains plants'. Explain the statement.
7. In a developing embryo, analyse the consequences if cell divisions are not followed by cell differentiation.
8. List the changes observed in an angiosperm flower subsequent to pollination and fertilisation.
9. Suggest a possible explanation why the seeds in a pea pod are arranged in a row, whereas those in tomato are scattered in the juicy pulp.
10. Draw the sketches of a zoospore and a conidium. Mention two dissimilarities between them and atleast one feature common to both structures.
11. Justify the statement 'Vegetative reproduction is also a type of asexual reproduction'.

LONG ANSWER TYPE QUESTIONS

1. Enumerate the differences between asexual and sexual reproduction. Describe the types of asexual reproduction exhibited by unicellular organisms.
2. Do all the gametes formed from a parent organism have the same genetic composition (identical DNA copies of the parental genome)? Analyse the situation with the background of gametogenesis and provide or give suitable explanation.
3. Although sexual reproduction is a long drawn, energy-intensive complex form of reproduction, many groups of organisms in Kingdom Animalia and Plantae prefer this mode of reproduction. Give atleast three reasons for this.
4. Differentiate between (a) oestrus and menstrual cycles; (b) ovipary and vivipary. Cite an example for each type.

5. Rose plants produce large, attractive bisexual flowers but they seldom produce fruits. On the other hand a tomato plant produces plenty of fruits though they have small flowers. Analyse the reasons for failure of fruit formation in rose.

   Both these plants - rose and tomato - both selected by human beings for different characteristics, the rose for its flower and tomato for its fruit. Roses, being vegetatively propagated do not need to produce seeds.