PRACTICE PAPER 07
CHAPTER 07 HOW DO ORGANISMS REPRODUCE?

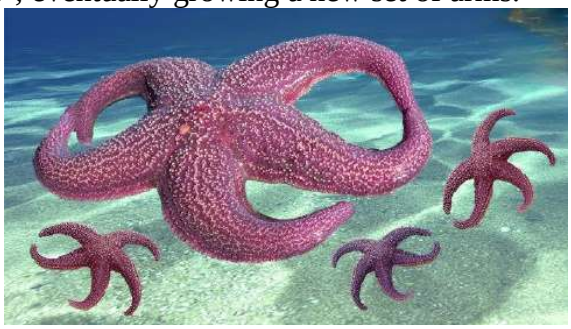
SUBJECT: SCIENCE **MAX. MARKS : 40**
CLASS : X **DURATION : 1½ hrs**

General Instructions:
(i). **All** questions are compulsory.
(ii). This question paper contains 2**0** questions divided into five Sections A, B, C, D and E.
(iii). **Section A** comprises of **10 MCQs** of **1 mark** each. **Section B** comprises of 4 questions of **2 marks** each. **Section C** comprises of 3 questions of **3 marks** each. **Section D** comprises of 1 question of **5 marks** each and **Section E** comprises of 2 Case Study Based Questions of **4 marks** each.
(iv). There is no overall choice.
(v). Use of Calculators is not permitted

SECTION – A

Questions 1 to 10 carry 1 mark each.

1. Asexual reproduction in starfish takes place by fission or through autotomy of arms. In fission, the central disc breaks into two pieces and each portion then regenerates the missing parts. In autotomy, an arm is shed with part of the central disc attached, which continues to live independently as a "comet", eventually growing a new set of arms.

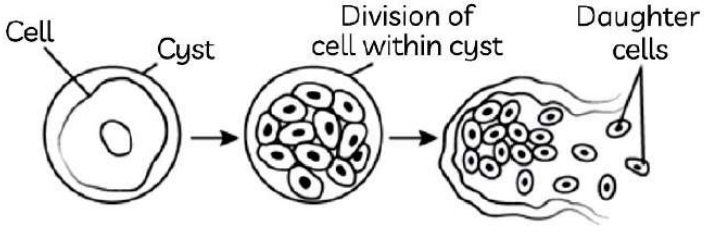


Offspring formed by asexual method of reproduction have greater similarity among themselves because:
(I) asexual reproduction involves only one parent.
(II) asexual reproduction does not involve gametes.
(III) asexual reproduction occurs before sexual reproduction.
(IV) asexual reproduction occurs after sexual reproduction.
Options:
(a) (I) and (II) (b) (I) and (III) (c) (II) and (IV) (d) (III) and (IV)

2. Select the INCORRECT match (between the plant and its vegetative part) from the following:
(a) Bryophyllum, leaf (b) Potato, stem (c) Money-plant, stem (d) Rose, root

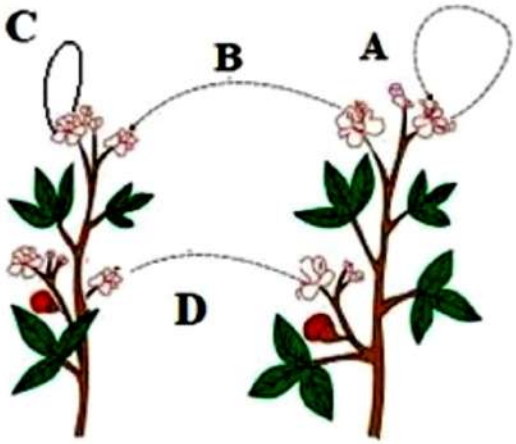
3. The number of chromosomes in parents and offsprings of a particular species remains constant due to:
(a) doubling of chromosomes after zygote formation
(b) halving of chromosomes during gamete formation
(c) doubling of chromosomes after gamete formation
(d) halving of chromosomes after gamete formation

4. The image shows the process of division in Plasmodium.



What can be concluded about the division in Plasmodium?
(a) The cyst divides repeatedly to form many daughter cells.
(b) The cell divides multiple times giving rise to many daughter cells.
(c) The nucleus divides repeatedly inside the cell to form new daughter cells.
(d) Thy cyst enlarges in size and then bursts producing many new daughter cells.

5. 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

6. The table lists some changes that occur inside the female body after fertilisation of egg with sperm.
(A) Rhythmic contractions of uterus muscle for child birth.
(B) Formation of placenta.
(C) Implantation of embryo.
(D) Development of organs in foetus.
(E) Cell division of zygote.
Which option correctly sequences these events?
(a) C→B→E→A→D (b) E→C→D→B→A (c) E→C→B→D→A (d) C→E→A→B→D

7. The image shows the production of a new sugarcane from an existing sugarcane plant. The method is called vegetative propagation. Which option supports the name of this process?
(a) It is a sexual method of producing new plants.
(b) It is an asexual method of producing new plants.
(c) It does not require a parent plant for reproduction.
(d) It involves fusion of two parts of a single parent for reproduction.

8. A farmer wants to grow banana plants genetically similar enough to the plants already available in his field. Which one of the following methods would you suggest for this purpose?
(a) Regeneration (b) Budding (c) Vegetative propagation (d) Sexual reproduction

In the following questions 9 and 10, a statement of assertion (A) is followed by a statement of reason (R). Mark the correct choice as:
(a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).
(b) Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).
(c) Assertion (A) is true but reason (R) is false.
(d) Assertion (A) is false but reason (R) is true.

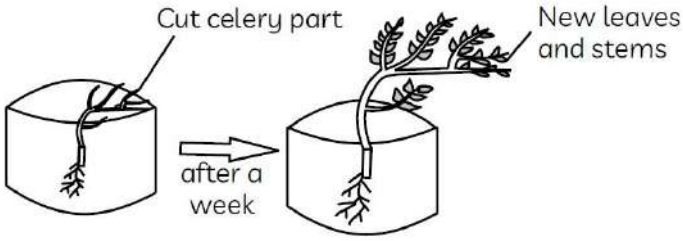
9. **Assertion (A):** Pollen grains are produced by all flowers.
Reason (R): Stamen is the male reproductive part of a flower and produces pollen grains.

10. **Assertion (A):** A basic event in reproduction is the creation of a DNA copy.
Reason (R): The DNA in the cell's nucleus is the information source for making proteins.

SECTION – B

Questions 11 to 14 carry 2 marks each.

11. Medha cut a celery plant into two pieces. She placed the lower part of the cut celery in a jar of water.



The pictures below show what Medha observed after a week.
What can Medha conclude from her activity?

12. Give an example each of unisexual and bisexual flowers.

13. What would be the ratio of chromosome numbers between an egg and a zygote? How is the sperm genetically different from the egg?

14. 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.

SECTION – C

Questions 15 to 17 carry 3 marks each.

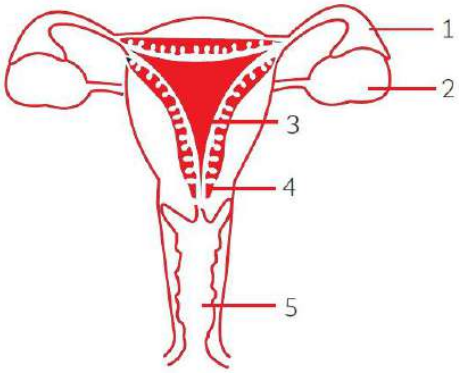
15. Sneha was taught by her teacher that ‘‘Variation is useful for the survival of species.’’ She passed on the same information to her friend, Abdul. Support the view of both Sneha and her teacher by giving a suitable justification for the same.

16. (i) What are sexually transmitted diseases (STD)? List two viral and two bacterial STDs.
(ii) Give two reasons for avoiding frequent pregnancies by women.

17. What are chromosomes ? Explain how in sexually reproducing organisms the number of chromosomes in the progeny is maintained.

OR

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



(b) What is contraception? List three advantages of adopting contraceptive measure.

SECTION – D

Questions 18 carry 5 marks.

18. (i) Draw a diagram to show spore formation in Rhizopus.
(ii) With the help of an example differentiate between the process of budding and fragmentation.
(iii) Why is vegetative propagation practiced for growing some type of plants?

OR

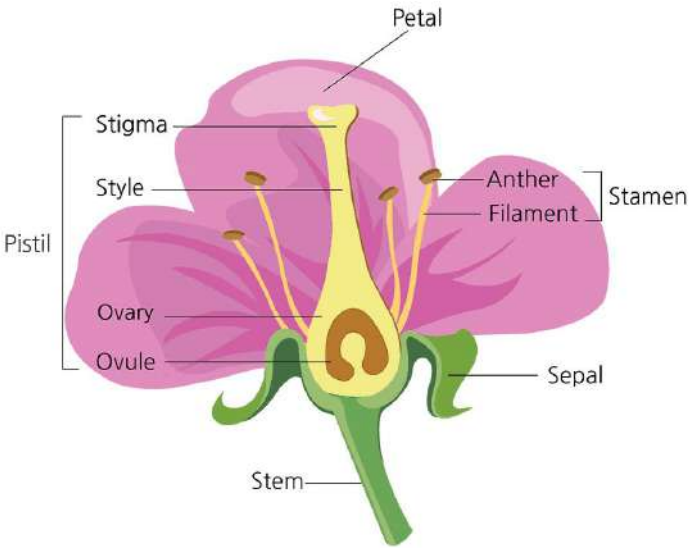
(a) Write the functions of each of the following parts in a human female reproductive system:
(i) Ovary (ii) Uterus (iii) Fallopian tube
(b) Write the structure and functions of placenta in a human female.

SECTION – E (Case Study Based Questions)

Questions 19 to 20 carry 4 marks each.

19. Read the given passage and answer the questions based on passage and related studied concepts.

The reproductive parts of angiosperms are located in the flower. The different parts of a flower are sepals, petals, stamens and carpels. Stamens and carpels are the reproductive parts of a flower which contain the germ cells. The flower may be unisexual (papaya, watermelon) when it contains either stamens or carpels or bisexual (Hibiscus, mustard) when it contains both stamens and carpels. Stamen is the male reproductive part and it produces pollen grains that are yellowish in colour. Carpel is present in the centre of a flower and is the female reproductive part.



(a) (i) Where are the plant's sex organs located? (1)
(ii) What is the function of a flower? (1)
(b) Where is the male and female gametes formed in flowering plants? (1)
(c) What changes take place in the flower after fertilisation which lead to the formation of seeds and fruit? (1)

20. An all India lockdown was announced throughout the country in March 2020 to control the spread of Corona virus. During the lockdown period, Megha developed an interest in gardening and successfully propagated several money plants through cutting.

(a) Which part of money plant did Megha use to propagate money plant? What name is given to such type of methods?
(b) Can you grow Peepal or Neem by the method which is used by Megha?
(c) Which part of the plant you would use to grow the following plants?
Bryophyllum, Potato, Dahlia, Onion, Sweet-potato, Mint
Is there any disadvantage of growing the above mentioned plants by this method?

PRACTICE PAPER 07
CHAPTER 07 HOW DO ORGANISMS REPRODUCE?
(ANSWERS)

SUBJECT: SCIENCE **MAX. MARKS : 40**

CLASS : X **DURATION : 1½ hrs**

General Instructions:

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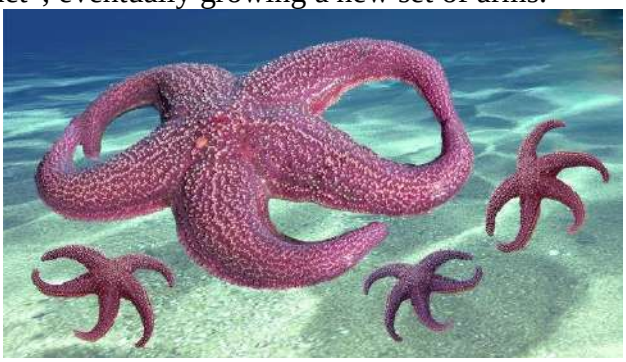
(iv). There is no overall choice.
(v). Use of Calculators is not permitted

SECTION – A

Questions 1 to 10 carry 1 mark each.

1. Asexual reproduction in starfish takes place by fission or through autotomy of arms. In fission, the central disc breaks into two pieces and each portion then regenerates the missing parts. In autotomy, an arm is shed with part of the central disc attached, which continues to live independently as a "comet", eventually growing a new set of arms.



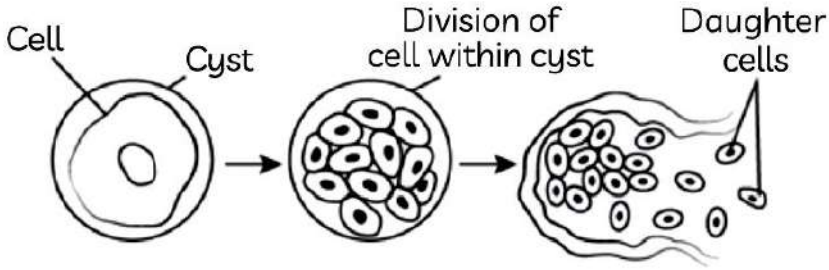
Offspring formed by asexual method of reproduction have greater similarity among themselves because:
(I) asexual reproduction involves only one parent.
(II) asexual reproduction does not involve gametes.
(III) asexual reproduction occurs before sexual reproduction.
(IV) asexual reproduction occurs after sexual reproduction.
Options:
(a) (I) and (II) (b) (I) and (III) (c) (II) and (IV) (d) (III) and (IV)
Ans. (a) (I) and (II)
In the process of asexual reproduction, only one parent is involved and there is no fusion of the male and the female gametes. As a result, the offsprings so produced are genetically similar, having same chromosome number to their parents and are called clones.

2. Select the INCORRECT match (between the plant and its vegetative part) from the following:
(a) Bryophyllum, leaf (b) Potato, stem (c) Money-plant, stem (d) Rose, root
Ans. (d) Rose, root
Stem cuttings are a method of asexual or vegetative reproduction in rose plants and the new rose plant developed from the cutting resembles the original plant. This method is frequently used to grow roses.

3. The number of chromosomes in parents and offsprings of a particular species remains constant due to:

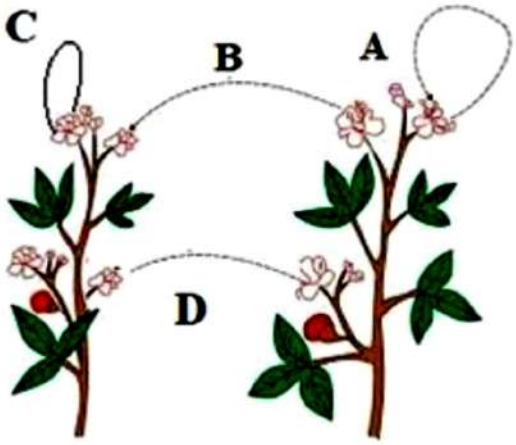
(a) doubling of chromosomes after zygote formation
(b) halving of chromosomes during gamete formation
(c) doubling of chromosomes after gamete formation
(d) halving of chromosomes after gamete formation
Ans. (b) halving of chromosomes during gamete formation
The gametes have half the number of chromosomes as compared to that of normal body cells. Reduction division (meiosis) takes place during gamete formation, which halves the number of chromosomes in both male and female gametes.
So, when a male gamete combines with a female gamete during sexual reproduction, then the new cell, zygote will have a normal amount of DNA, i.e., original chromosome number (as in both parents) is restored.

4. The image shows the process of division in Plasmodium.



What can be concluded about the division in Plasmodium?
(a) The cyst divides repeatedly to form many daughter cells.
(b) The cell divides multiple times giving rise to many daughter cells.
(c) The nucleus divides repeatedly inside the cell to form new daughter cells.
(d) Thy cyst enlarges in size and then bursts producing many new daughter cells.
Ans. (b) The cell divides multiple times giving rise to many daughter cells.
The nucleus of Plasmodium divides into multiple nuclei if within the cyst. These freshly formed nuclei are surrounded by cytoplasm, resulting in the development of daughter cells. As a result, multiple fission produces a large number of daughter cells. The cyst cracks open under ideal or favorable conditions, releasing these cells.

5. 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
Ans. (b) B and D
Male and female gametes are formed by the same parent plant in selfpollination (as shown by "A" and "C"), and the progeny produced almost exactly resembles the parent plant. As they grow on the same plant, this indicates that the genetic makeup of the male and female flowers is the same.

Cross-pollination (represented by the letters “B” and “D”), allows two genetically different plant characteristics from the same species to fuse. Due to the mixing of genetically diverse gametes, it causes genetic recombination and variability in plants.

6. The table lists some changes that occur inside the female body after fertilisation of egg with sperm.
(A) Rhythmic contractions of uterus muscle for child birth.
(B) Formation of placenta.
(C) Implantation of embryo.
(D) Development of organs in foetus.
(E) Cell division of zygote.
Which option correctly sequences these events?
(a) C→B→E→A→D (b) E→C→D→B→A
(c) E→C→B→D→A (d) C→E→A→B→D
Ans. (c) E→C→B→D→A
The sperm fertilises the egg in the fallopian tube. The fertilised egg, the zygote gets implanted in the lining of the uterus and starts dividing and become embryo. Foetus is a stage of embryo which nearly resembles a human being. The embryo gets its nutrition from mother’s blood with the help of a special tissue called placenta. The development of the child inside the mother’s body takes approximately nine months. The child is born as a result of rhythmic contraction of the muscles in the uterus.

7. The image shows the production of a new sugarcane from an existing sugarcane plant. The method is called vegetative propagation. Which option supports the name of this process?
(a) It is a sexual method of producing new plants.
(b) It is an asexual method of producing new plants.
(c) It does not require a parent plant for reproduction.
(d) It involves fusion of two parts of a single parent for reproduction.
Ans. (b) It is an asexual method of producing new plants.
Vegetative propagation is a type of asexual plant reproduction. There is only one plant involved, and the progeny are the offspring of only one parent. The new plant is genetically similar to the original plant and is derived from its parts.

8. A farmer wants to grow banana plants genetically similar enough to the plants already available in his field. Which one of the following methods would you suggest for this purpose?
(a) Regeneration (b) Budding (c) Vegetative propagation (d) Sexual reproduction
Ans. (c) Vegetative propagation
I would suggest the method of vegetative propagation. It is an asexual mode of reproduction and can be accomplished by propagating banana rhizome as it has the ability to produce new banana plants.

In the following questions 9 and 10, a statement of assertion (A) is followed by a statement of reason (R). Mark the correct choice as:
(a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).
(b) Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).
(c) Assertion (A) is true but reason (R) is false.
(d) Assertion (A) is false but reason (R) is true.

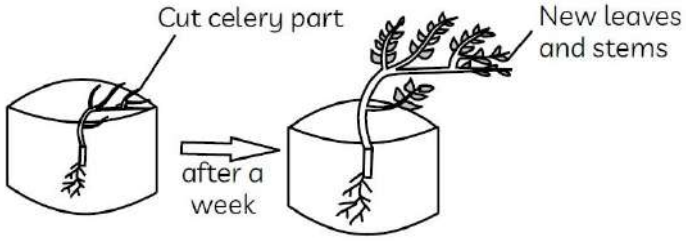
9. **Assertion (A):** Pollen grains are produced by all flowers.
Reason (R): Stamen is the male reproductive part of a flower and produces pollen grains.
Ans. (d) (A) is false but (R) is true.
All flowers do not produce pollen grains as flowers may be unisexual when they contain either stamen or pistil or bisexual when they contain both stamen and pistil. Stamen is the male reproductive part of a flower and produces pollen grains that are yellowish in colour.

10. Assertion (A): A basic event in reproduction is the creation of a DNA copy.
Reason (R): The DNA in the cell's nucleus is the information source for making proteins.
Ans. (a) Both (A) and (R) are true, and (R) is the correct explanation of (A).
Organisms look similar because they have similar body designs. As the DNA in the cells nucleus is the information source for making proteins and if this information source is changed, different proteins will be made which will lead to altered body designs. Therefore, the creation of a DNA copy by chemical reactions is a basic event in reproduction.

SECTION – B

Questions 11 to 14 carry 2 marks each.

11. Medha cut a celery plant into two pieces. She placed the lower part of the cut celery in a jar of water.



The pictures below show what Medha observed after a week.
What can Medha conclude from her activity?
Ans. Medha observed after a week, that new leaves and stem have grown from the cut celery part. This shows that the whole celery plant can reproduce from the cut celery part. This is known as vegetative propagation which means new plants can grow from the vegetative part i.e., stem of the plant. This method is a very fast and economical and all the celery leaves and stems are genitally similar to the parent plant.

12. Give an example each of unisexual and bisexual flowers.
Ans. An example of:
(i) Unisexual flower - Papaya and watermelon
(ii) Bisexual flower - Hibiscus and mustard.

13. What would be the ratio of chromosome numbers between an egg and a zygote? How is the sperm genetically different from the egg?
Ans. The ratio of chromosome numbers between egg and its zygote is 1:2.
Both sperm and egg contain half number of chromosome, i.e., 23 chromosomes. Sperm is genetically different from the egg in the way that it contains either X or Y chromosome, whereas an egg always contains an X chromosome.

14. 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.
Ans. (a) The greenish black powdery mass on a stale piece of bread is due to bread mould Rhizopus, which reproduces by spore formation.
(b) Hyphae or thread like structures are the vegetative part and tiny blob like structures or sporangia are the reproductive parts.

SECTION – C

Questions 15 to 17 carry 3 marks each.

15. Sneha was taught by her teacher that ‘‘Variation is useful for the survival of species.’’ She passed on the same information to her friend, Abdul. Support the view of both Sneha and her teacher by giving a suitable justification for the same.

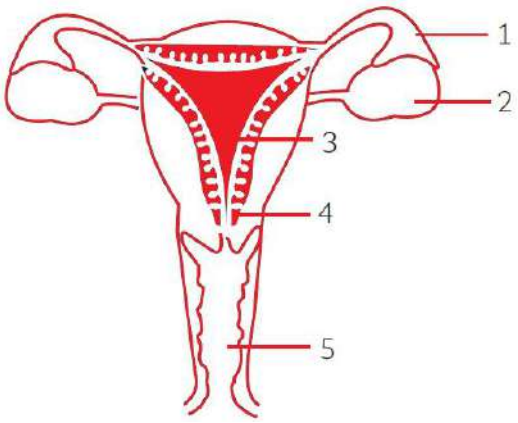
Ans. Variations which are favourable, increase the chances of survival of the species. If an organism can withstand a higher temperature, then the variation goes on accumulating in its future generations. Hence, these organisms can survive sudden rise in the temperature. This ensures the survival of the species. But other organisms (variants) without this variation may not survive due to sudden rise in temperature. So, variation is beneficial to the species, but not necessary for an individual.

16. (i) What are sexually transmitted diseases (STD)? List two viral and two bacterial STDs.
(ii) Give two reasons for avoiding frequent pregnancies by women.
Ans. (i) Sexually transmitted diseases (STD) are a group of communicable diseases that are transmitted predominantly by sexual contact and are caused by a wide range of bacterial, viral, protozoan and fungal agents and ectoparasites.
Viral STDs — AIDS, Hepatitis
Bacterial STDs — Syphilis, Gonorrhea
(ii) Frequent pregnancies by women are avoided due to the following reasons:
(a) It has adverse effect on the health of women.
(b) It increases the rate of the population of our country.

17. What are chromosomes ? Explain how in sexually reproducing organisms the number of chromosomes in the progeny is maintained.
Ans. Chromosomes are thread—like structures present in nucleus containing genetic material / DNA.
Number of chromosomes are reduced to half during gametes / germ cell formation.
After fertilisation of germ cells the number of chromosomes is maintained in progeny.

OR

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



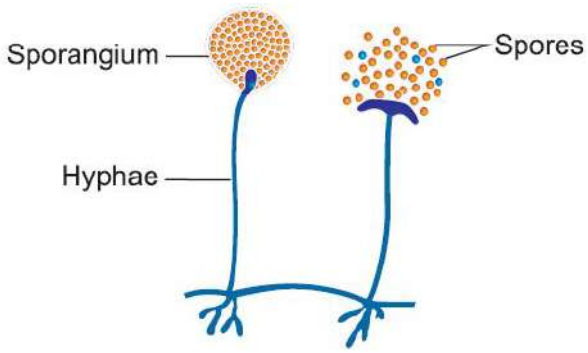
(b) What is contraception? List three advantages of adopting contraceptive measure.
Ans. (a) The given diagram is of human female reproductive system.
Name of the parts are given below: (i) Fallopian tube/Oviduct (ii) Ovary
(iii) Uterus (iv) Cervix (v) Vagina
(b) Contraception: These are the techniques which have been developed to prevent and manage unwanted pregnancies and to prevent the spread of sexually transmitted diseases (STDs).
Advantages of adopting contraceptive methods:
(i) Avoiding frequent and unwanted pregnancy.
(ii) Keeping birth rate and hence population under control.
(iii) Helps in keeping proper gap between two pregnancies.
(iv) Helps in preventing the transfer of sexually transmitted diseases (STDs).

SECTION – D

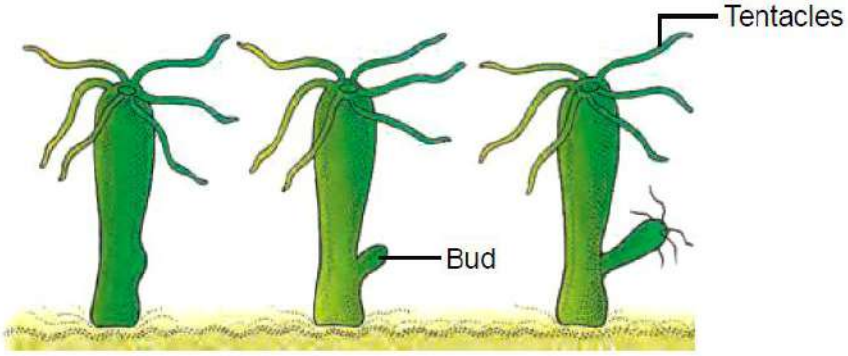
Questions 18 carry 5 marks.

18. (i) Draw a diagram to show spore formation in Rhizopus.
(ii) With the help of an example differentiate between the process of budding and fragmentation.

(iii) Why is vegetative propagation practiced for growing some type of plants?
Ans. (i)



(ii) Organisms such as Hydra use regenerative cells for reproduction in the process of budding. In Hydra, a bud develops as an outgrowth due to repeated cell division at one specific site (Fig.). These buds develop into tiny individuals and when fully mature, detach from the parent body and become new independent individuals. In multi-cellular organisms with relatively simple body organisation, simple reproductive methods can still work. Spirogyra, for example, simply breaks up into smaller pieces upon maturation. These pieces or fragments grow into new individuals.



(iii) Plants raised by vegetative propagation can bear flowers and fruits earlier than those produced from seeds. Such methods also make possible the propagation of plants such as banana, orange, rose and jasmine that have lost the capacity to produce seeds. Another advantage of vegetative propagation is that all plants produced are genetically similar enough to the parent plant to have all its characteristics.

OR

(a) Write the functions of each of the following parts in a human female reproductive system:
(i) Ovary
(ii) Uterus
(iii) Fallopian tube
(b) Write the structure and functions of placenta in a human female.
Ans. (a) (i) Ovary: Releases egg/ female gamete/ ovum, also releases oestrogen/ female hormones (Any one)
(ii) Oviduct: Transportation of ovum/ egg from ovary to the uterus/ Site of fertilisation
(iii) Uterus: Development of embryo/ foetus
(b) Placenta: It is a disc embedded in uterine wall which contains villi on the embryo side of the tissue and blood space on mother side.
Function of placenta: Provides nourishment to embryo from mother's blood / Removal of waste from embryo to mother's blood.

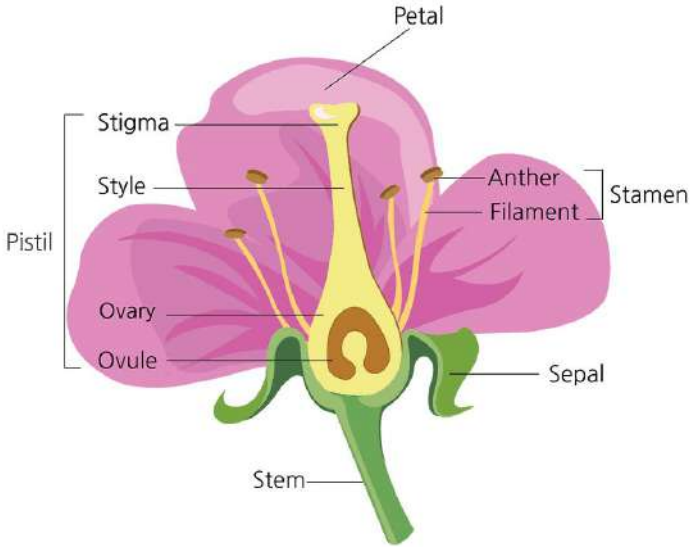
SECTION – E (Case Study Based Questions)

Questions 19 to 20 carry 4 marks each.

19. Read the given passage and answer the questions based on passage and related studied concepts.

The reproductive parts of angiosperms are located in the flower. The different parts of a flower are sepals, petals, stamens and carpels. Stamens and carpels are the reproductive parts of a flower

which contain the germ cells. The flower may be unisexual (papaya, watermelon) when it contains either stamens or carpels or bisexual (Hibiscus, mustard) when it contains both stamens and carpels. Stamen is the male reproductive part and it produces pollen grains that are yellowish in colour. Carpel is present in the centre of a flower and is the female reproductive part.



(a) (i) Where are the plant's sex organs located? (1)
(ii) What is the function of a flower? (1)
(b) Where is the male and female gametes formed in flowering plants? (1)
(c) What changes take place in the flower after fertilisation which lead to the formation of seeds and fruit? (1)
Ans. (a) (i) Plant's sex organs are located in the flower.
(ii) The function of a flower is to produce male and female gametes and to ensure that fertilisation takes place to make new seeds for the reproduction of plant.
(b) The male gamete is formed in the anther of the flower and female gamete is formed in ovary of the flower.
(c) The fertilised egg divides several times to form an embryo within the ovule which develops a tough coat around it and is gradually converted into a seed. The ovary of the flower develops and becomes a fruit with seeds inside it.

20. An all India lockdown was announced throughout the country in March 2020 to control the spread of Corona virus. During the lockdown period, Megha developed an interest in gardening and successfully propagated several money plants through cutting.

(a) Which part of money plant did Megha use to propagate money plant? What name is given to such type of methods?
(b) Can you grow Peepal or Neem by the method which is used by Megha?
(c) Which part of the plant you would use to grow the following plants?
Bryophyllum, Potato, Dahlia, Onion, Sweet-potato, Mint
Is there any disadvantage of growing the above mentioned plants by this method?

Ans. (a) Megha can use the stem of money plant containing nodes and internodes to propagate money plant. Plants like rose and sugarcane grow by stem cutting. This type of asexual reproduction is known as vegetative propagation.

(b) No, because Neem or Peepal produce seeds and grow sexually by seeds.

Vegetative propagation is possible only in those plants which have lost the capacity to produce seeds or produce non viable seeds.

(c) A new plant develops from the vegetative parts of a plant in the given plants:

Plant	**Part of Plant used for Vegatative Propagation**
Bryophyllum	Leaf
Potato	Stem
Dahlia	Root
Onion	Stem
Sweet potato	Root
Mint	Stem

Disadvantages: Plants grown by vegetative propagation have less vigour than the plants grown by seeds. Undesirable characters or disease contracted by the parent plant is also transmitted to new plants.