

# UNIQUE STUDY POINT

By Sumeet Sahu

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Unique Study Point, Amitesh Nagar, Indore, MP | Contact: 8103405051

<b>Class:</b> X	<b>Subject:</b> Science	<b>Session:</b> 2025-26
<b>Chapter:</b> 07 - How do Organisms Reproduce?	<b>Time:</b> 1½ Hours	<b>Max. Marks:</b> 40

## General Instructions:

1. All questions are compulsory.
2. This question paper contains 20 questions divided into five sections A, B, C, D and E.
3. Section A contains 10 MCQs of 1 mark each.
4. Section B contains 4 questions of 2 marks each.
5. Section C contains 3 questions of 3 marks each.
6. Section D contains 1 question of 5 marks.
7. Section E contains 2 Case Study Based questions of 4 marks each.

## SECTION A - Multiple Choice Questions (1 mark each)

- Q1.** Which of the following is NOT an example of asexual reproduction?
- (a) Budding in Yeast
  - (b) Fertilization in flowering plants
  - (c) Binary fission in Amoeba
  - (d) Spore formation in Rhizopus
- Q2.** The female part of a flower consisting of stigma, style and ovary is called:
- (a) Stamen
  - (b) Pistil
  - (c) Sepal
  - (d) Petal
- Q3.** The development of an embryo from a zygote is known as:
- (a) Fertilization
  - (b) Pollination
  - (c) Development
  - (d) Germination
- Q4.** In human reproduction, fertilization takes place in:
- (a) Uterus
  - (b) Vagina
  - (c) Ovary
  - (d) Fallopian tube
- Q5.** The approximate time for human embryo development inside mother's body is:
- (a) 3 months
  - (b) 6 months

- (c) 9 months
- (d) 12 months

**Q6.** Which of the following is a bisexual flower?

- (a) Papaya
- (b) Watermelon
- (c) Mustard
- (d) Pumpkin

**Q7.** The common passage for sperms and urine in males is:

- (a) Vas deferens
- (b) Testis
- (c) Urethra
- (d) Penis

**Q8.** Plants like banana and orange are commonly propagated by vegetative methods because they:

- (a) Produce many seeds
- (b) Have lost capacity to produce seeds
- (c) Grow very slowly
- (d) Have small flowers

**Q9.** DNA is present in the cell's:

- (a) Cytoplasm
- (b) Cell wall
- (c) Nucleus
- (d) Cell membrane

**Q10.** Which sexually transmitted disease is caused by a virus?

- (a) Gonorrhoea
- (b) Syphilis
- (c) HIV-AIDS
- (d) All of these

### SECTION B - Short Answer Questions (2 marks each)

**Q11.** What is puberty? At what age does it generally occur in humans?

**Q12.** What is the significance of sexual reproduction over asexual reproduction?

**Q13.** Why cannot complex multicellular organisms reproduce through cell-by-cell division?

**Q14.** List two sexually transmitted diseases. How can they be prevented?

### SECTION C - Short Answer Questions (3 marks each)

**Q15.** What is tissue culture? Explain its advantages in plant propagation.

**Q16.** Explain why variations are important for a species. Support your answer with an example.

**Q17.** Describe the changes that occur in a flower after fertilization leading to fruit and seed formation.

### SECTION D - Long Answer Question (5 marks)

**Q18.** Describe the various modes of asexual reproduction found in different organisms. Give suitable examples for each mode.

### SECTION E - Case Study Based Questions (4 marks each)

**Q19. Case Study 1:**

Priya's mother is 42 years old and became pregnant unexpectedly. The family was not prepared for another child due to financial constraints and her mother's health concerns. They consulted a doctor who explained various contraceptive methods and the importance of family planning for the well-being of both mother and existing children.

Based on this case study, answer the following:

- (a) Why is family planning important? (1 mark)
- (b) Name two temporary contraceptive methods. (1 mark)
- (c) Which contraceptive method also prevents STDs? (1 mark)
- (d) What is the difference between temporary and permanent contraceptive methods? (1 mark)

**Q20. Case Study 2:**

In a science lab, students placed a wet slice of bread in a cool, moist, and dark place. After one week, they observed fuzzy growth on the bread. Under a microscope, they saw thread-like hyphae and round structures on stalks called sporangia. Inside the sporangia were numerous tiny spores protected by thick walls.

Based on this case study, answer the following:

- (a) What organism grew on the bread? (1 mark)
- (b) What is the function of hyphae? (1 mark)
- (c) How do spores help in reproduction? (1 mark)
- (d) Why are spores suitable for survival in unfavorable conditions? (1 mark)

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## DETAILED ANSWER KEY - PAPER 04

### SECTION A - Answers to MCQs

#### Answer 1: (b) Fertilization in flowering plants

Fertilization in flowering plants is sexual reproduction as it involves fusion of male and female gametes from two different sources.

#### Answer 2: (b) Pistil

Pistil is the female reproductive part present in the centre of a flower, made of stigma, style, and ovary.

#### Answer 3: (c) Development

The process of changes that take place in an organized sequence for the zygote to develop into an embryo is called development.

#### Answer 4: (d) Fallopian tube

Fertilization occurs in the fallopian tube (oviduct) where the sperm meets and fuses with the egg.

#### Answer 5: (c) 9 months

The development of the child inside the mother's body takes approximately nine months.

#### Answer 6: (c) Mustard

Mustard and Hibiscus are bisexual flowers containing both stamens and pistil, while papaya and watermelon have unisexual flowers.

#### Answer 7: (c) Urethra

The urethra forms a common passage for both sperms and urine in the male reproductive system.

#### Answer 8: (b) Have lost capacity to produce seeds

Vegetative propagation makes possible the propagation of plants such as banana, orange, rose, and jasmine that have lost the capacity to produce seeds.

#### Answer 9: (c) Nucleus

The chromosomes in the nucleus of a cell contain DNA (Deoxyribonucleic Acid) molecules which carry genetic information.

#### Answer 10: (c) HIV-AIDS

HIV-AIDS is caused by a virus, while gonorrhoea and syphilis are bacterial infections. All are sexually transmitted diseases.

### SECTION B - Answers to Short Answer Questions

#### Answer 11:

**Puberty:** The period during adolescence when reproductive tissues begin to mature and sexual maturation occurs is called puberty.

**Age:** It generally occurs during early teenage years (around 10-14 years in girls and 12-16 years in boys). The exact age varies from person to person.

### Answer 12:

#### **Significance of Sexual Reproduction:**

- Sexual reproduction creates more variations by combining DNA from two different individuals
- These variations are beneficial for survival of species over time
- If environment changes, some variants may survive while others adapted to old conditions may not
- Asexual reproduction creates limited variation, making species more vulnerable to environmental changes

### Answer 13:

Complex multicellular organisms cannot reproduce through cell-by-cell division because:

- They are not simply a random collection of cells
- Specialized cells are organized as tissues, and tissues are organized into organs
- Organs must be placed at definite positions in the body
- In such carefully organized situations, cell-by-cell division would be impractical
- They need more complex reproductive methods involving specialized reproductive cells

### Answer 14:

#### **Examples of STDs:**

- Bacterial infections: Gonorrhoea, Syphilis
- Viral infections: Warts, HIV-AIDS

#### **Prevention:**

Using condoms during sexual intercourse helps prevent transmission of many sexually transmitted infections.

## SECTION C - Answers to Short Answer Questions

### Answer 15:

**Tissue Culture:** A technique where new plants are grown by removing tissue or separating cells from the growing tip of a plant.

#### **Process:**

- Cells are placed in artificial medium where they divide rapidly to form callus
- Callus is transferred to another medium with hormones for growth and differentiation
- Plantlets are then placed in soil to grow into mature plants

#### **Advantages:**

- Many plants can be grown from one parent
- Plants are grown in disease-free conditions
- Commonly used for ornamental plants
- Allows rapid multiplication of desirable plant varieties

### Answer 16:

#### **Importance of Variations:**

- Variations are useful for the survival of species over time
- Populations fill specific niches in the ecosystem
- If environmental conditions change drastically, a population without variations could be wiped out
- Some variations present in a few individuals provide chance for survival

#### **Example:**

If there were a population of bacteria living in temperate waters at 25°C, and if the water temperature increased to 40°C due to global warming:

- Most bacteria adapted to 25°C would die
- A few variants resistant to heat would survive
- These heat-resistant bacteria would grow and reproduce
- Eventually, the population would be dominated by heat-resistant variants
- Thus, variation ensured species survival despite drastic environmental change

### Answer 17:

#### Changes After Fertilization:

##### 1. Zygote to Embryo:

- After fertilization, zygote is formed in the ovule
- Zygote divides several times to form an embryo
- Embryo develops within the ovule

##### 2. Seed Formation:

- The ovule develops a tough coat
- Ovule is gradually converted into a seed
- Seed contains the embryo (future plant)

##### 3. Fruit Formation:

- The ovary grows rapidly and ripens to form a fruit
- Fruit encloses the seeds

##### 4. Other Changes:

- Petals, sepals, stamens shrivel and fall off
- Style and stigma may also fall off
- Some flower parts may persist in the fruit (like sepals in some fruits)

## SECTION D - Answer to Long Answer Question

### Answer 18:

#### Modes of Asexual Reproduction:

##### 1. Fission:

- Cell division leads to creation of new individuals
- **Binary fission:** Splitting into two equal halves (Example: Amoeba, bacteria)
- **Multiple fission:** Division into many daughter cells simultaneously (Example: Plasmodium)
- In some organisms like Leishmania, fission occurs in definite orientation

##### 2. Budding:

- Small buds develop as outgrowths on parent body
- Buds mature and detach to become independent individuals
- **Example:** Hydra (uses regenerative cells), Yeast (puts out small buds)

##### 3. Fragmentation:

- Organism breaks into smaller pieces upon maturation
- Each fragment grows into a new individual
- **Example:** Spirogyra (simple multi-cellular organism)

##### 4. Regeneration:

- Ability to develop complete organism from broken body parts
- Uses specialized cells that proliferate and differentiate
- **Example:** Planaria, Hydra can regenerate from cut pieces

- Not the normal mode of reproduction

### 5. Vegetative Propagation:

- Parts like root, stem, leaves develop into new plants
- **Example:** Bryophyllum (buds on leaves), Potato (buds on tubers), Money plant (cuttings), Sugarcane
- Also includes tissue culture technique

### 6. Spore Formation:

- Organisms produce spores in sporangia
- Spores have thick protective walls
- Develop into new individuals when conditions are favorable
- **Example:** Rhizopus (bread mould), Ferns, Mosses

## SECTION E - Answers to Case Study Based Questions

### Answer 19:

#### (a) Why is family planning important?

Family planning is important because:

- Pregnancy makes major demands on body and mind of woman
- If not prepared, woman's health will be adversely affected
- Allows proper spacing between children
- Ensures financial and emotional readiness for parenthood

#### (b) Two temporary contraceptive methods:

- Condoms (mechanical barrier method)
- Oral contraceptive pills (hormonal method)
- Copper-T (intrauterine device)

(Any two)

#### (c) Method that prevents STDs:

Condoms help prevent transmission of sexually transmitted diseases by creating a mechanical barrier.

#### (d) Difference between temporary and permanent methods:

**Temporary methods:** Can be reversed; fertility can be restored after stopping use (condoms, pills, Copper-T)

**Permanent methods:** Cannot be reversed; create permanent blocks in reproductive ducts through surgery (vasectomy in males, tubectomy in females)

### Answer 20:

#### (a) Organism that grew on bread:

Rhizopus (bread mould) - a fungus

#### (b) Function of hyphae:

Hyphae are thread-like structures that are not involved in reproduction. They help in obtaining nutrition and provide structural support to the organism.

#### (c) How spores help in reproduction:

Spores are reproductive cells present in sporangia. When spores come into contact with a moist surface under favorable conditions, they germinate and develop into new Rhizopus individuals.

#### (d) Why spores suitable for unfavorable conditions:

Spores are covered by thick walls that protect them during unfavorable conditions. They can survive harsh environments like drought, extreme temperatures, or lack of nutrition. When favorable conditions return,

they can germinate and grow into new organisms.

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