# UNIQUE STUDY POINT

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| **Class:** X | **Subject:** Science | **Session:** 2025-26 |
| **Chapter:** 07 - How do Organisms Reproduce? | **Time:** 1½ Hours | **Max. Marks:** 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.** Asexual reproduction through budding takes place in:

(a) Amoeba

(b) Yeast

(c) Leishmania

(d) Plasmodium

**Q2.** Spirogyra reproduces by:

(a) Binary fission

(b) Fragmentation

(c) Budding

(d) Multiple fission

**Q3.** Which of the following contains pollen grains?

(a) Ovary

(b) Stigma

(c) Anther

(d) Style

**Q4.** The female germ cells in humans are produced in:

(a) Uterus

(b) Ovaries

(c) Fallopian tubes

(d) Vagina

**Q5.** The monthly cycle in females lasting 2-8 days is known as:

(a) Puberty

(b) Fertilization

(c) Menstruation
(d) Ovulation

**Q6.** Which organism shows regeneration?
(a) Amoeba
(b) Yeast
(c) Planaria
(d) Leishmania

**Q7.** Vegetative propagation is commonly practiced in:
(a) Wheat
(b) Sugarcane
(c) Maize
(d) Rice

**Q8.** The fusion of male and female gametes is called:
(a) Pollination
(b) Fertilization
(c) Germination
(d) Reproduction

**Q9.** Which part is NOT a part of the male reproductive system?
(a) Testis
(b) Vas deferens
(c) Fallopian tube
(d) Urethra

**Q10.** What develops into a seed after fertilization?
(a) Ovary
(b) Ovule
(c) Pollen grain
(d) Stigma

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

**Q11.** What is fission? Name two organisms that reproduce by fission.

**Q12.** What is the role of seminal vesicles and prostate gland in reproduction?

**Q13.** Distinguish between self-pollination and cross-pollination.

**Q14.** What changes are commonly seen in both boys and girls during puberty?

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

**Q15.** Explain vegetative propagation with two examples. What are the advantages of this method?

**Q16.** Describe the female reproductive system in human beings.

**Q17.** Why is DNA copying not absolutely accurate? What is the significance of this for evolution?

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

**Q18.** Explain how fertilization and embryo development occur in human beings. Describe the role of placenta in this process.

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

**Q19. Case Study 1:**

Amit was studying about Bryophyllum plants in his garden. He observed that small plantlets were growing along the leaf margins of the plant. His science teacher explained that these buds fall on the soil and develop into new plants without any requirement of seeds.

Based on this case study, answer the following:

(a) What type of reproduction is shown by Bryophyllum? (1 mark)

(b) Where do the buds develop in Bryophyllum? (1 mark)

(c) What happens when these buds fall on soil? (1 mark)

(d) Why is this method advantageous for plant propagation? (1 mark)

**Q20. Case Study 2:**

A biologist was studying a population of bacteria living in temperate water at 25°C. Due to global warming, the water temperature increased to 40°C over several years. Initially, most bacteria died, but a few variants that could tolerate higher temperatures survived and reproduced, gradually increasing their population.

Based on this case study, answer the following:

(a) Why did most bacteria die when temperature increased? (1 mark)

(b) What enabled some bacteria to survive? (1 mark)

(c) How were these variations created? (1 mark)

(d) What is the significance of variation for species survival? (1 mark)

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# DETAILED ANSWER KEY - PAPER 02

## SECTION A - Answers to MCQs

**Answer 1: (b) Yeast**

Yeast reproduces through budding where small buds are put out that separate and grow further.

**Answer 2: (b) Fragmentation**

Spirogyra simply breaks up into smaller pieces (fragments) upon maturation, and these pieces grow into new individuals.

**Answer 3: (c) Anther**

The anther is the male reproductive part of the stamen that produces pollen grains.

**Answer 4: (b) Ovaries**

The female germ cells or eggs are made in the ovaries.

**Answer 5: (c) Menstruation**

Menstruation is the monthly cycle where the uterine lining breaks and comes out through the vagina as blood and mucous, usually lasting 2-8 days.

**Answer 6: (c) Planaria**

Planaria can be cut into pieces and each piece grows into a complete organism through regeneration.

**Answer 7: (b) Sugarcane**

Vegetative propagation is commonly used in plants like sugarcane, roses, and grapes for agricultural purposes.

**Answer 8: (b) Fertilization**

Fertilization is the fusion of male and female germ cells to form a zygote.

**Answer 9: (c) Fallopian tube**

Fallopian tube is part of the female reproductive system, not the male reproductive system.

**Answer 10: (b) Ovule**

The ovule develops a tough coat and is gradually converted into a seed after fertilization.

## SECTION B - Answers to Short Answer Questions

**Answer 11:**

**Fission:** For unicellular organisms, cell division or fission leads to the creation of new individuals. Many bacteria and protozoa simply split into two or more daughter cells.

**Examples:** Amoeba (binary fission) and Plasmodium (multiple fission).

**Answer 12:**

Seminal vesicles and prostate gland are glands in the male reproductive system that add their secretions along the path of vas deferens. These secretions help in:

• Making transport of sperms easier by providing fluid
• Providing nutrition to the sperms

### Answer 13:

**Self-pollination:** When transfer of pollen grains occurs from the anther to the stigma of the same flower.

**Cross-pollination:** When pollen grains are transferred from one flower to another flower. This is achieved by agents like wind, water or animals.

### Answer 14:

Common changes in both boys and girls during puberty:
• Thick hair growth in new parts like armpits and genital area
• Thinner hair appears on legs, arms, and face
• Skin frequently becomes oily and pimples may develop
• Increased awareness of their own bodies and others

## SECTION C - Answers to Short Answer Questions

### Answer 15:

**Vegetative Propagation:** Many plants have parts like root, stem and leaves that develop into new plants under appropriate conditions.

**Examples:**
1. Buds in Bryophyllum leaf margins fall on soil and develop into new plants
2. Potato pieces with buds can give rise to new plants

**Advantages:**
• Plants can bear flowers and fruits earlier than those from seeds
• Useful for plants that have lost capacity to produce seeds (banana, orange)
• All plants produced are genetically similar to parent plant

### Answer 16:

**Female Reproductive System:**
• **Ovaries:** Make female germ cells (eggs) and produce hormones. One egg is produced every month
• **Fallopian tubes/Oviduct:** Thin tubes that carry egg from ovary to uterus. Fertilization occurs here
• **Uterus:** Elastic bag-like structure where embryo develops. Prepares monthly to receive fertilized egg
• **Cervix:** Opening through which uterus opens into vagina
• **Vagina:** Passage through which sperms enter during sexual intercourse

### Answer 17:

**Why DNA copying is not absolutely accurate:**
• No bio-chemical reaction is absolutely reliable
• The copying process has some variations each time
• DNA copies generated are similar but may not be identical to the original

**Significance for evolution:**
• This inbuilt tendency for variation during reproduction is the basis for evolution
• Some variations might be drastic and harmful, leading to cell death
• However, surviving cells with useful variations can adapt to environmental changes
• Over time, these variations accumulate and lead to evolution of species

## SECTION D - Answer to Long Answer Question

**Answer 18:**

**Fertilization and Embryo Development in Humans:**

**1. Fertilization:**
• Sperms enter through vaginal passage during sexual intercourse
• They travel upwards and reach the oviduct (fallopian tube)
• One sperm fuses with the egg in the oviduct
• This fusion forms a zygote

**2. Embryo Formation and Implantation:**
• The fertilized egg (zygote) starts dividing
• Forms a ball of cells called embryo
• The embryo is implanted in the lining of the uterus
• The uterine lining is thick and richly supplied with blood

**3. Role of Placenta:**
• Placenta is a disc-shaped special tissue embedded in the uterine wall
• It contains villi on the embryo's side
• Mother's blood spaces surround these villi
• Provides large surface area for exchange of materials
• Functions of placenta:
  - Transfers glucose and oxygen from mother to embryo
  - Removes waste substances from embryo to mother's blood
  - Provides nutrition for embryo development

**4. Development:**
• Embryo continues to grow and develop organs to become foetus
• Development takes approximately nine months
• Child is born through rhythmic contractions of uterine muscles

## SECTION E - Answers to Case Study Based Questions

**Answer 19:**

**(a) Type of reproduction:**
Vegetative propagation (asexual reproduction)

**(b) Where buds develop:**
Buds develop in the notches along the leaf margins of Bryophyllum.

**(c) What happens when buds fall on soil:**
When the buds fall on soil, they develop into new complete Bryophyllum plants.

**(d) Advantage of this method:**
This method allows rapid propagation without the need for seeds, and all new plants are genetically similar to the parent plant, ensuring consistent characteristics.

**Answer 20:**

**(a) Why did most bacteria die?**
Most bacteria died because they were adapted to live at 25°C and could not survive the drastic change to 40°C temperature.

**(b) What enabled some bacteria to survive?**
A few bacteria had variations (genetic differences) that made them heat-resistant, enabling them to tolerate higher temperatures.

**(c) How were variations created?**
Variations were created during DNA copying in reproduction. The DNA copying mechanism is not absolutely accurate, leading to slight differences in DNA copies.

**(d) Significance of variation:**
Variation is useful for the survival of species over time. When environmental conditions change drastically, some variants can survive and continue the species, while others may die. This ensures species don't go extinct due to environmental changes.

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