

II. Very short answer type questions

- | | | | |
|------|-----------------------------------------------------------------------------|------|--------------------|
| Q.1 | The process by which living things produce offspring of their own kind | Ans: | Reproduction |
| Q.2 | Special reproductive cells | Ans: | Gametes |
| Q.3 | The process by which male and female gametes fuse to form a zygote | Ans: | Fertilisation |
| Q.4 | Male sex hormone | Ans: | Testosterone |
| Q.5 | The process by which an ovum is released from the ovary | Ans: | Ovulation |
| Q.6 | The period in which the baby stays and grows inside the mother's womb | Ans: | Gestation |
| Q.7 | The part of the female body that is called the womb | Ans: | Uterus |
| Q.8 | Animals that give birth to live offspring | Ans: | Viviparous animals |
| Q.9 | Animals that lay eggs that hatch into offspring | Ans: | Oviparous animals |
| Q.10 | The transformation of larva into an adult through series of drastic changes | Ans: | Metamorphosis |

III. Short answer type questions

- Q.1 What is reproduction? Name two types of reproduction in an organism.
Ans: Reproduction is the biological process by which living organisms produce offspring of their own kind to ensure the continuity of life.

Two types of reproduction are:

4. Differentiate between internal and external fertilization.

Ans:

Internal Fertilization	External Fertilization
Fertilization occurs inside the female body.	Fertilization occurs outside the female body, usually in water.
Example: Humans, cats	Example: Frogs, fish

5. What are chromosomes? Name the two types of sex chromosomes.

- Ans: Chromosomes are thread-like structures found in the nucleus of cells that carry genetic information. Two types of sex chromosomes are:

a) X chron

6. What is parturition?

Ans: Parturition is the process of giving birth to a foetus.

7. What are viviparous animals? Give two examples.
Ans: Viviparous animals are those that give birth to live young ones instead of laying eggs.

Examples: Humans, Dogs

8. Define metamorphosis. Name two animals that undergo metamorphosis.
Ans: Metamorphosis is a biological process in which an organism undergoes a drastic transformation in body form from the larval stage to the adult stage.
Examples: Butterfly, Frog

9. Write a short note on gender issues and myths associated with female infanticide.

- Ans: Gender issues arise from the belief that males are superior to females. This often leads to discrimination against girls, including the harmful practice of female infanticide — the killing of new born girls due to a preference for sons. Myths include the belief that only sons can carry the family name or support parents in old age. These beliefs are unjust, illegal & need to be challenged through awareness & education.

10. What are some of the problems associated with adolescent pregnancy?

- Ans: Adolescent pregnancy can lead to several health and social problems including:

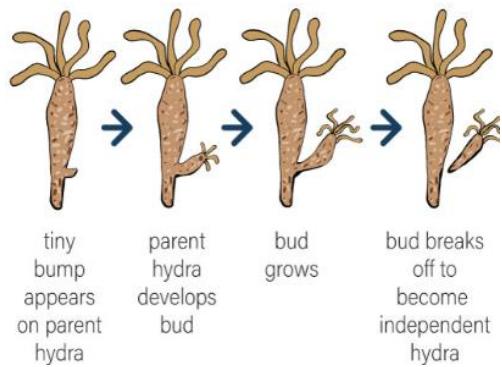
 - a) Increased risk of maternal and infant health complications
 - b) Interrupted education and limited career opportunities
 - c) Social stigma and emotional stress
 - d) Higher chances of poverty and dependency

IV. Long answer type questions**1. With the help of a labelled diagram, explain how an animal reproduces asexually.**

Ans: One common method of asexual reproduction in animals is budding, seen in *Hydra*.

Explanation:

- A small outgrowth or bud forms on the parent's body.
- The bud grows using the nutrients from the parent.
- Once fully developed, it detaches and becomes a new individual.

Labelled Diagram Description:

- Parent Hydra
- Developing bud
- Tentacles on the bud
- Bud detaches

2. Explain the structure of human male and female gametes with the help of diagrams.

Ans: Structure of Human Male and Female Gametes

Human Male Gamete (Sperm Cell)

The male gamete is called the sperm cell. It is small, motile, and specially designed to carry the male genetic material to the female gamete (egg) during fertilization.

Structure of Human Sperm Cell:

- Head:** The head contains the nucleus, which carries the haploid set of chromosomes (23 chromosomes in humans). It is covered by a cap-like structure called the acrosome, which contains enzymes that help in penetrating the egg during fertilization.
- Middle Piece:** The middle piece contains mitochondria that provide energy (ATP) required for the movement of the sperm.
- Tail (Flagellum):** The tail is a long, whip-like structure that propels the sperm forward, allowing it to swim towards the egg.

Human Female Gamete (Egg Cell or Ovum)

The female gamete is called the egg cell (ovum). It is larger than the sperm cell and non-motile. The egg contains the female genetic material and, upon fertilization, provides the nutrients required for the early development of the zygote.

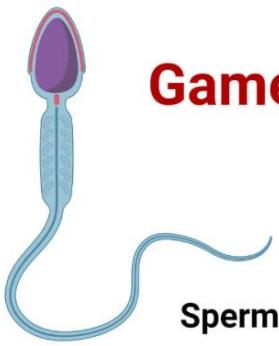
Structure of Human Egg Cell:

- Cytoplasm:** The cytoplasm of the egg contains yolk, which provides nourishment for the early stages of development.
- Nucleus:** The nucleus of the egg contains the female haploid set of chromosomes (23 chromosomes in humans).
- Plasma Membrane:** The egg is surrounded by a plasma membrane, which prevents more than one sperm from fertilizing it.

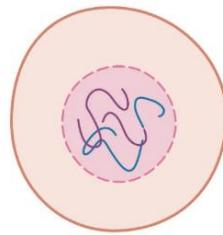
Conclusion:

- Male gamete (sperm): Small, motile, with a tail for movement and acrosome for penetrating the egg.
- Female gamete (egg): Larger, non-motile, contains cytoplasm for nourishment and a nucleus with chromosomes.

These gametes fuse during fertilization to form a zygote, which develops into an embryo.



Gametes



Sperm

Ovum

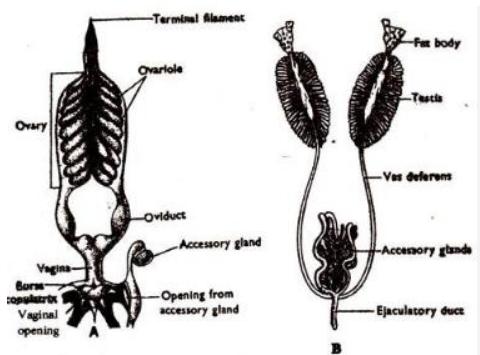
- a) Sperm: Head → Nucleus, Middle piece → Mitochondria, Tail → Flagellum
- b) Ovum: Circular cell → Nucleus, Cytoplasm, Cell membrane

Q.3 With the help of a labelled diagram, explain how reproduction takes place in human beings.

Explanation (Sexual Reproduction in Humans):

- a) Male reproductive organ produces sperms in testes.
- b) Female reproductive organ produces ova in ovaries.
- c) During reproduction, sperm is deposited into the vagina and travels through the uterus to meet the ovum in the oviduct (fallopian tube).
- d) Fertilization occurs here, forming a zygote.
- e) The zygote travels to the uterus, implants in the wall, and develops into a baby.

Labelled Diagram Description:



- Male: Testes, Vas deferens, Urethra, Penis
- Female: Ovary, Oviduct, Uterus, Vagina

Q.4 Describe the stepwise process of fertilization in human beings.

Ans: **Stepwise Process of Fertilization in Human Beings**

Fertilization in human beings is the process by which a **male sperm** and a **female egg** (ovum) combine to form a **zygote**. This process takes place in the **fallopian tube** of the female reproductive system. Here's a detailed stepwise explanation:

Step 1: Ovulation (Release of Egg)

- a) Every month, during the menstrual cycle, one mature egg is released from the **ovary** into the **fallopian tube**. This process is called **ovulation**.
- b) The egg is now ready to be fertilized by the sperm.

Step 2: Sperm Entry (Through the Female Reproductive Tract)

- a) During sexual intercourse, **millions of sperm** are ejaculated into the **vagina**.
- b) The sperm swim through the cervix and into the **uterus**, and from there, they travel up to the **fallopian tube** where the egg is located.

Step 3: Capacitation of Sperm

- a) Before fertilization, the sperm undergo a process called **capacitation**.
- b) Capacitation involves biochemical changes in the sperm's membrane, allowing it to penetrate the egg's outer layers.

Step 4: Sperm Penetration

- a) The sperm reach the egg and bind to its outer membrane. The outer layer of the egg is called the **zona pellucida**.
- b) The sperm's **acrosome** (cap-like structure at the head of the sperm) releases enzymes that break down the **zona pellucida**, allowing the sperm to penetrate the egg.
- c) Only **one sperm** successfully enters the egg.

Step 5: Fusion of Nuclei

- a) Once the sperm enters the egg, its **nucleus** combines with the **egg's nucleus**, each contributing half of the **23 chromosomes** (haploid sets).
- b) This fusion results in the formation of a **diploid zygote** (with a total of 46 chromosomes), which contains the genetic material from both the mother and father.

Step 6: Formation of Zygote

- a) The fertilized egg (zygote) now contains a complete set of **46 chromosomes** (23 from the mother and 23 from the father).
- b) The zygote begins to divide through **mitosis** and forms multiple cells, eventually becoming a **blastocyst**.

Step 7: Implantation

- a) The zygote continues dividing as it travels down the fallopian tube toward the **uterus**.
- b) After a few days, the blastocyst reaches the uterus and attaches itself to the thickened **endometrial lining** of the uterus, where it will continue to develop.
- c) This process is known as **implantation**, marking the beginning of pregnancy.

- Q.5 With the help of an example, illustrate how a pair of chromosomes determine the sex of a child in human beings.

Ans: Sex Determination in Humans

- a) Humans have **two types of sex chromosomes: X and Y**.
- b) **Females** have **XX** chromosomes, and **males** have **XY** chromosomes.

Process of Determining Sex:

- a) **Mother's Egg:** Always carries an **X** chromosome (since females are **XX**).
- b) **Father's Sperm:** Can carry either an **X** or a **Y** chromosome.

Fertilization:

- a) If the **father's sperm** carries an **X** chromosome, the fertilized egg will be **XX**, resulting in a **female child**.
- b) If the **father's sperm** carries a **Y** chromosome, the fertilized egg will be **XY**, resulting in a **male child**.

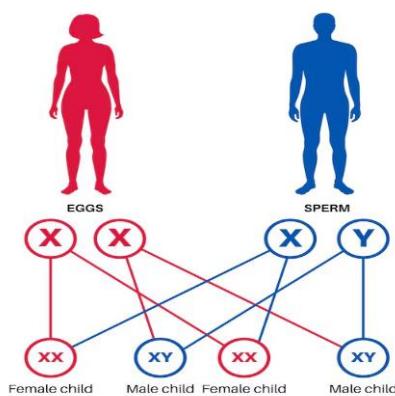
Example:

- a) **Female Child (XX):**
Mother (X) + Father (X) = **XX** → Female
- b) **Male Child (XY):**
Mother (X) + Father (Y) = **XY** → Male

Conclusion:

- a) The **father** determines the sex of the child by contributing either an **X** (female) or **Y** (male) chromosome.

Diagram Description:



Q.6 With the help of a labelled diagram, explain the life cycle of a frog.

Ans: Life Cycle of a Frog: - The life cycle of a frog is an example of **complete metamorphosis**. It involves four distinct stages: **egg**, **tadpole**, **juvenile frog (tadpole with legs)**, and **adult frog**.

Stages in the Life Cycle of a Frog:

1. Egg Stage:

- * Female frogs lay eggs in water. The eggs are surrounded by a jelly-like substance that protects them.
- * The eggs hatch into larvae known as **tadpoles**.

2. Tadpole Stage:

- * Tadpoles hatch from the eggs and are aquatic.
- * They have a tail for swimming and gills for breathing underwater.
- * Tadpoles feed on algae and other small organisms in the water.

3. Juvenile Frog (Tadpole with Legs):

- * As the tadpole matures, it begins to grow **hind legs**, followed by **front legs**.
- * The tail starts to shrink, and the **lungs** develop, allowing the frog to breathe air.
- * The tadpole is now transforming into a juvenile frog.

4. Adult Frog:

- * The tail disappears completely, and the frog becomes fully adapted to life on land and water.
- * The adult frog can breathe through **lungs** and skin is capable of reproducing to start the cycle again.

Diagram Labels:

Frog Life Cycle

