CBT: APRIL 2025
CLASS – XII: BIOLOGY

GENERAL INSTRUCTION :

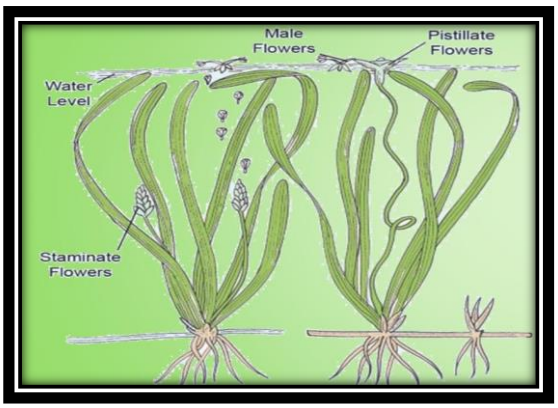
SCORE AND REVIEW OF ALL THE QUESTIONS WILL BE PROVIDED IN THE EMAIL TO ALL THE STUDENTS ON NEXT DAY AND AFTER CLOSING OF QUIZ TIME.

IMPORTANT : ALL THE STUDENTS SHOULD FILL THE CORRECT SCHOOL NAME FROM DROP DOWN BUTTON

CHAPTERS COVERED:
Chapter-1: Sexual Reproduction in Flowering Plants
Chapter-2: Human Reproduction (Only structures of Male and female Reproductive System)

Q.1: **Pollination Beneath the Surface: Nature's Aquatic Adaptation**

In aquatic environments, certain plants have adapted unique strategies to ensure successful reproduction. Among these adaptations, hydrophily is a specialized mode of pollination where water acts as the medium for the transfer of pollen. Some aquatic plants have evolved to release pollen that can move either on the water's surface or beneath it, depending on the plant's structure and habitat. Unlike terrestrial plants that rely on wind or animals, hydrophilous plants often possess flowers that are not showy, as they do not need to attract pollinators visually or through scent. Their pollen grains typically exhibit features that enable them to survive and travel efficiently in water. Understanding these adaptations helps in identifying which plants use water for pollination and how the process differs from pollination in other ecological settings. Now answer the questions given below:



1.Which of the following plants is an example of a species that shows hydrophily?

(A) Rose

(B) Water lily

(C) Vallisneria

(D) Sunflower

Answer: (C) Vallisneria

Feedback: Vallisneria is a submerged aquatic plant that exhibits hydrophily, where pollination occurs through water. It uses water currents to transfer pollen from the male to the female flower.

2.In hydrophilous plants, where does pollination typically occur?

(A) On the surface of the water

(B) In the air

(C) Underwater

(D) A and C both are correct

Answer: (D) On the surface of the water and (C) Underwater

Feedback: In hydrophilous plants, pollination can take place either on the water surface (epihydrophily, e.g., Vallisneria) or underwater (hypohydrophily, e.g., Zostera), depending on the species.

3.Which of the following characteristics is typical of hydrophilous flowers?

(A) Brightly coloured petals to attract pollinators

(B) Pollen that is buoyant and water-resistant

(C) Strong fragrance to attract aquatic animals

(D) Nectar production to feed fish

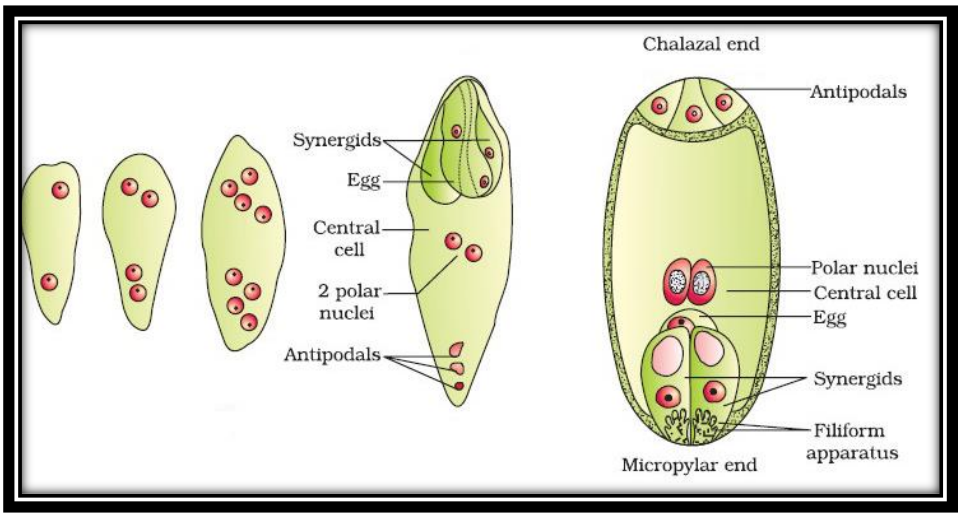
Answer: (B) Pollen that is buoyant and water-resistant

Feedback: Hydrophilous flowers produce pollen that is light, non-sticky, and water-resistant so it can float or travel in water without damage, aiding effective pollination.

Q.2: **Megasporogenesis: The Birthplace of the Female Gametophyte**

In angiosperms, megasporogenesis is the fascinating process that gives rise to the female gametophyte, the embryo sac, within the ovule. It all starts with a single diploid cell in the nucellus, called the megaspore mother cell (MMC). Through meiosis, the MMC undergoes a crucial reduction division, producing four haploid megaspores arranged in a linear tetrad. However, the story takes a turn here. Unlike microsporogenesis (pollen formation), where all four spores are functional, in most angiosperms, only one megaspore survives. The remaining three degenerate, usually those towards the micropylar end.

This lucky survivor embarks on a further mitotic journey, undergoing three rounds of nuclear division without cytokinesis (cell division). This creates a unique 7-celled, 8-nucleated structure called the embryo sac. The embryo sac houses the female gametes – the egg cell and synergid cells – along with other supporting cells that play vital roles in fertilization and seed development. Understanding megasporogenesis is essential as it lays the foundation for sexual reproduction and seed formation in flowering plants. The intricate dance of meiosis and mitosis within the ovule paves the way for the development of the future generation.



Q.1: Megaspore mother cell in ovule

(A) Generally differentiates in chalazal region of the nucellus

(B) Is a large cell containing dense cytoplasm and a prominent nucleus

(C) Divides by mitosis to form a linear tetrad that further divides to form eight nuclei

(D) Both (2) and (3)

Answer is (B)

Feedback : The megaspore mother cell is indeed a large cell with dense cytoplasm and a prominent nucleus.

Q.2: Largest cell in polygonum type of embryo sac is

(A) Synergid

(B) Egg

(C) Central cell

(D) Antipodal cells

Answer is (C)

Feedback : In the Polygonum type of embryo sac, which is the most common type of embryo sac development in angiosperms, the structure includes: One egg cell , Two synergids ,Three antipodal cells ,One central cell, which contains two polar nuclei.

The central cell is the largest cell in the embryo sac because it contains two polar nuclei and is destined to become the primary endosperm nucleus upon fertilization.

Q.3: Assertion: Double fertilization is a unique feature of flowering plants.

Reason: In double fertilization, one sperm fertilizes the egg to form a zygote, while the other sperm combines with two polar nuclei to form endosperm in the seed.

(A) If both assertion and reason are true and reason is the correct explanation of assertion

(B) If both assertion and reason are true but reason is not the correct explanation of assertion

(C) If assertion is true but reason is false

(D) If both assertion and reason are false

Answer – A: If both assertion and reason are true and reason is the correct explanation of assertion

Feedback: Double fertilization is indeed a unique feature of angiosperms (flowering plants). It involves two fertilization events: one male gamete fuses with the egg to form a zygote, while the other fuses with the two polar nuclei to form the triploid endosperm, which nourishes the developing embryo. This makes the Reason a correct explanation of the Assertion.

Q.3: **The Orchestra of Human Reproduction: Male and Female Systems**

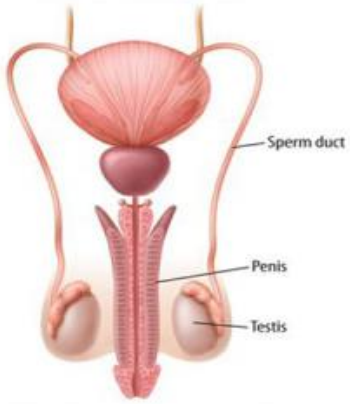
The human story begins with the intricate dance of the male and female reproductive systems. Both systems work in harmony to achieve fertilization and create new life.

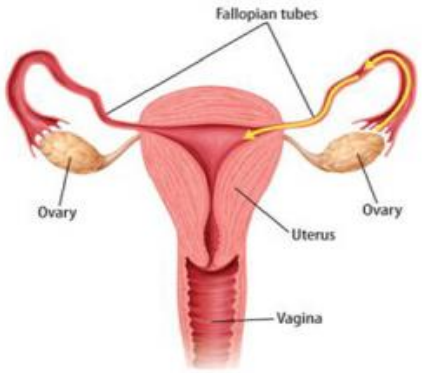
The Male System: Manufacturing and Delivery: The male reproductive system centers around the testes, the paired gonads nestled within the scrotum. Here, sperm cells, the male gametes, are produced under the influence of testosterone. These immature sperm mature as they travel through the epididymis, a coiled tube atop each testis. During ejaculation, sperm travel through the vas deferens, seminal vesicles (which contribute seminal fluid for sperm nourishment and motility), and the prostate gland (which further liquefies semen) before reaching the urethra for expulsion. The penis, the copulatory organ, houses the urethra and delivers sperm to the female reproductive tract.

The Female System: Nurturing the Spark of Life: The female reproductive system orchestrates egg production, fertilization, fetal development, and childbirth. The ovaries, the female gonads, house immature eggs (oocytes) until puberty. Each month, one oocyte matures and is released during ovulation. The fallopian tubes,

delicate tubes flanking the uterus, capture the released egg. Fertilization, the union of sperm and egg, typically occurs within the fallopian tubes. The fertilized egg then travels to the uterus, a pear-shaped muscular organ lined with a nurturing endometrium. If fertilization doesn't occur, the endometrium sheds, resulting in menstruation. If implantation occurs, the endometrium thickens to support the developing embryo, which eventually becomes a fetus. The muscular vagina serves as the birth canal during childbirth and also allows for sperm entry during intercourse. The external genitalia, collectively called the vulva, includes the mons pubis, labia majora and minora, clitoris, and vestibule (which contains the opening of the vagina and urethra).

Together, these specialized structures of the male and female reproductive systems orchestrate the miracle of human reproduction.





1. Assertion : In human male, testes are extra abdominal and lie in scrotal sacs.

   Reason : Scrotum acts as thermo regulator and keeps testicular temperature lower by 2-2.5°C for normal spermatogenesis.

   (i) If both assertion and reason are true and reason is the correct explanation of assertion

   (ii) If both assertion and reason are true but reason is not the correct explanation of assertion

   (iii) If assertion is true but reason is false

   (iv) If both assertion and reason are false

   ANSWER. (i) If both assertion and reason are true and reason is the correct explanation of assertion

   FEEDBACK: Testes are located in the scrotum which is present outside the body. The scrotum acts as a thermoregulator as the temperature of scrotum is lower than the normal body temperature. This helps in proper maturation of the sperms during spermatogenesis and healthy sperms are thus produced.

2. Study the following parts of the male reproductive system.
   (A) Retetestis (B) Epididymis (C) Urethra (D) Seminiferous tubules
   (E) Vas deferens (F) Ejaculatory duct (G) Vasa efferentia
   The correct sequence of parts through which sperms pass out is Options:
   a) A, B, C, D, E, F, G
   b) D, A, G, B, E, F, C
   c) D, A, G, E, B, F, C
   d) D, G, A, B, E, F, C

   Answer. (b) : D, A, G, B, E, F, C

FEEDBACK: The correct sequence of parts through in which sperms pass out is Seminiferous tubules → Rete testis → vasa efferentia → epididymis → vas deferens → ejaculatory duct → urethra.

3. Corpus luteum is developed from
a) left over occyte
b) nephrostome
c) left over Graafian follicle after release of ovum
d) None of the above

Answer. (c) left over Graafian follicle after release of ovum

FEEDBACK: Corpus luteum is developed from left over Graafian follicle after release of ovum. The corpus luteum is a vital yet temporary organ that plays a crucial role in fertility during the luteal phase. It is an endocrine structure in females existing within the ovary once the ovarian follicle has released a mature ovum during ovulation.

4. Assertion : Fallopian funnel of oviduct is with finger like fimbriae.
Reason : Graafian follicle of ovary is with secondary oocyte hanging in cavity called antrum.
a) Both Assertion and Reason are true but Reason is not a correct explanation of Assertion
b) Both Assertion and Reason are true and Reason is a correct explanation of Assertion
c) Both Assertion and Reason are false
d) Assertion is true but Reason is false

Answer: (b) Both Assertion and Reason are true and Reason is a correct explanation of Assertion

FEEDBACK: Infundibulum is funnel shaped end of fallopian tube or oviduct. The funnel is called oviducal funnel or fallopian funnel. Its free end bears a number of finger like processes called fimbriae, but Graafian follicle of ovary is with secondary oocyte hanging in cavity, called antrum.