CBT 2024
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)

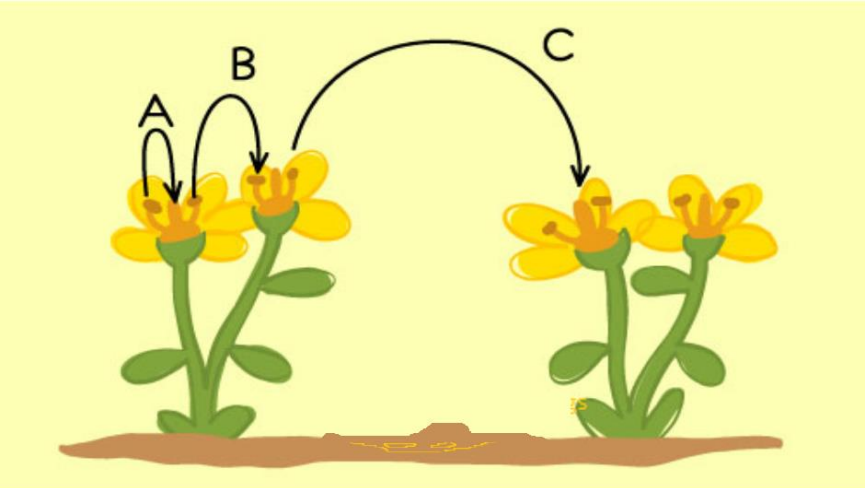
Q.1: Study the following and answer the questions given below:

Pollination: The Dance of Reproduction in Plants

Pollination, the cornerstone of plant sexual reproduction, is the transfer of pollen grains, containing male gametes, from the anther to the stigma (of a flower. This seemingly simple act paves the way for fertilization, seed formation, and ultimately, plant survival. There are two main types of pollination: self-pollination, where pollen lands on the stigma of the same flower, and cross-pollination, where pollen is transferred between flowers of different plants.

Self-pollination, while ensuring seed production, limits genetic variation in offspring. Cross-pollination, facilitated by various agents like insects (entomophily), birds (ornithophily), wind (anemophily), and water (hydrophily), introduces genetic diversity. This diversity enhances a plant population's resilience to environmental changes and diseases. Flowers have evolved intricate adaptations to attract specific pollinators

Pollination is a critical ecological process. It not only ensures the continuation of plant life but also supports entire food webs. Many fruits and vegetables we consume rely on successful pollination. By understanding the intricacies of pollination, we can promote healthy ecosystems and safeguard our food security.



1. What are appropriate terms for method A, B and C in above two diagrams:

(i) A: Geitonogamy, B: Xenogamy, C: Autogamy
(ii) A: Autogamy, B: Geitonogamy, C: Xenogamy
(iii) A: Autogamy, B: Xenogamy, C: Geitonogamy
(iv) A: Xenogamy, B: Autogamy, C: Geitonogamy

ANSWER: (ii) A: Autogamy, B: Geitonogamy, C: Xenogamy

Feedback: In autogamy, there is transfer of pollen grains from the anther to the stigma of the same flower. In geitonogamy, there is transfer of pollen grains

from anther to the stigma of another flower of the same plant. In xenogamy, there is transfer of pollen grains from anther to the stigma of a different plant.

2. Self-pollination is fully ensured if:
(i) The flower is bisexual.
(ii)The style is longer that the filament.
(iii) The flower is cleistogamous.
(iv) The time of pistil and anther maturity is different.

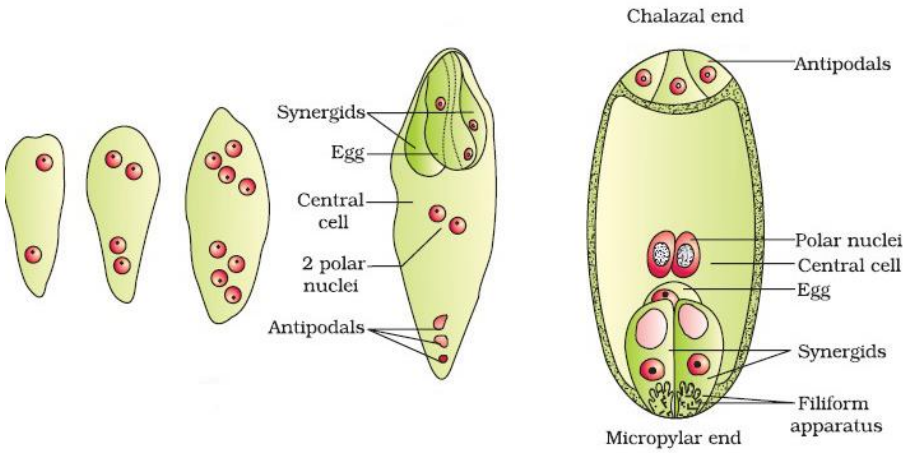
ANSWER: (iii) The flower is cleistogamous
Feedback: No cross-pollination occurs in cleistogamous flowers as these flowers are closed and never open and thus no transfer of pollen from outside to stigma of the flower is possible. e.g. Commelina, Viola, Oxalis, etc

3. Assertion: Insects visit flower to gather honey.
Reason: Attraction of flowers prevents the insects from damaging other parts of the plant.

(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. (iv) If both assertion and reason are false
FEEDBACK: Insects visit flower to gather nectar not-honey and get a coating of pollen grains of the flower, which are generally sticky. These pollen grains are dusted off when they come in contact with a stigma. Attraction of flowers cannot prevent the insects from damaging other parts as only those insects are attracted to the flowers which help in 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.



1. In flowering plants, a mature female Gametophyte is derived from "Megaspore mother cell" by:
(a) One meiotic division and three mitotic division
(b) Three meiotic divisions
(c) One meiotic division and two mitotic division
(d) One meiotic division and one mitotic division
Answer. (a) One meiotic division and three mitotic division
FEEDBACK : In flowering plants, a mature female gametophyte is derived from diploid megaspore mother cell by one meiotic division and three mitotic division. The meiotic division leads to the production of four haploid megaspore. Three of them degenerate and only one remains functional. This functional megaspore undergoes three successive meiotic division and produce eight nucleate cell which is called as embryo sac.

2. If the chromosome number of leaf cell is 42 the chromosome number of root cell, microspore mother cell and embryo respectively will be:
(a) 42, 42, 42
(b) 42, 21, 21
(c) 21, 21, 21
(d) 21, 21, 42
Answer. (a)42,42,42
FEEDBACK: If the chromosome number of leaf cell is 42, then the chromosome number of root cell, microspore mother cell and embryo respectively will be 42, 42 and 42 because these all are diploid in nature. Only the male and female gametes are haploid and they contain half the chromosome number of a plant body.

3. Which is/are the correct statements?
(1) seed cannot be formed after on fertilization
(2) seed is formed after one fertilization
(3) seed is formed before double fertilization
(4) fruit is produced after double fertilization
(a) 1, 2 and 3 are correct
(b) 1 and 2 are correct
(c) 2 and 4 are correct
(d) 1 and 3 are correct
Answer. (c) 2 and 4 are correct
ANSWER: The process of fertilization is unique in angiosperm and it is called as double fertilisaiton. Double fertilization involve 2 steps. First step is syngamy between one egg cell and one male gamete which results in seed formation. Second step is fusion between diploid secondary nucleus and one male gamete. This step is called triple fusion and results in the formation of endosperm. After this step fruit is formed.

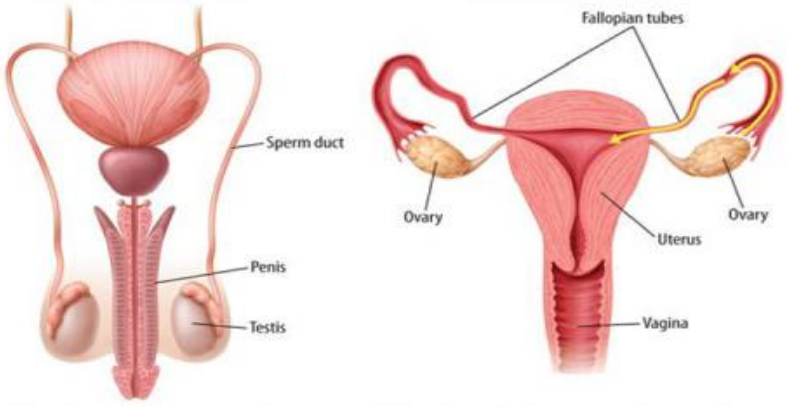
Q.3: **The Orchestra of Human Reproduction: Male and Female Systems**

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.