DAV PUBLIC SCHOOL, SECL, BISHRAMPUR

Summer Vacation Homework, 2026-27

Biology

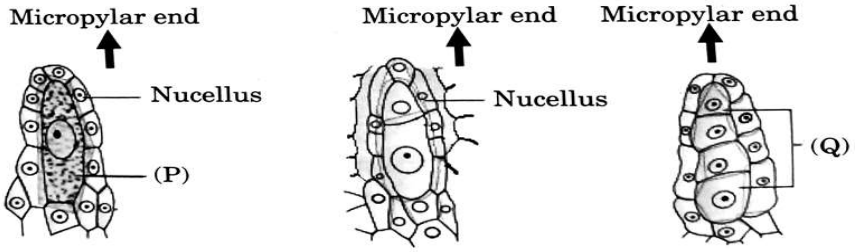
XII

I. Prepare a mind map for chapter sexual reproduction in flowering plants and human reproduction (till the topic taught in class) and paste it in class note copy.

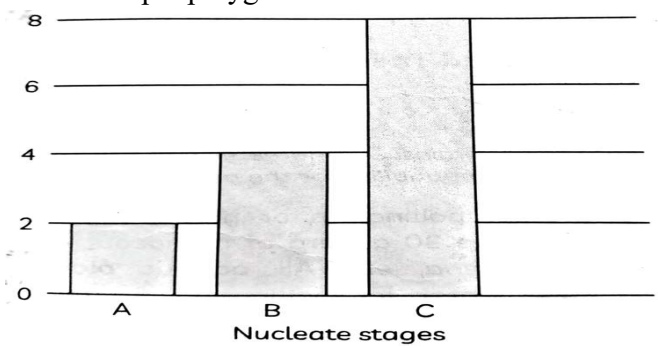
II. Prepare a model for the topics allotted in the class.

III. Solve the questions given below:

1. a) Explain the monosporic development of embryo sac in the ovule of an angiosperm
   b) Draw a diagram of the mature embryo sac of an angiospermic ovule and label any four parts in it.
2. "Pollen grains and microspores are the same structure." Do you agree with this statement? If not, then mention the difference between these two structures.
3. The papaya plant is quite successful in preventing autogamy and geitonogamy. Provide justification for this statement.
4. The mechanism of seed production in Asteraceae mimics sexual reproduction. Describe the mechanism.
5. Study the figures given below showing initial stages in the formation of female gametophyte and answer the questions that follow.



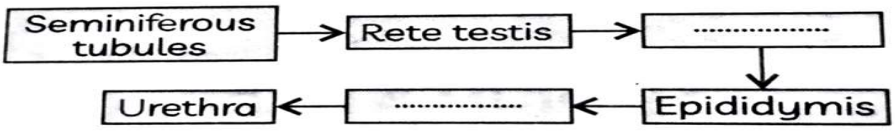
   a) Identify (P) and (Q)
   b) i) What kind of division does cell (P) undergo to form (Q)?
      ii) How many (Q) cells form the embryo sac? What is the name given to such kind of development.
      iii) How many free nuclear mitotic divisions will the functional megaspore undergo to form the embryo sac?
      iv) Describe the structure of a mature female gametophyte.
6. In the megaspore tetrad formed by megasporogenesis, out of the four, only one megaspore is functional, while the other three degenerate. The female gametophyte (embryo sac) develops only from this functional megaspore. This method of development of embryo sac from a single megaspore is termed as monosporic development. For example polygonum.



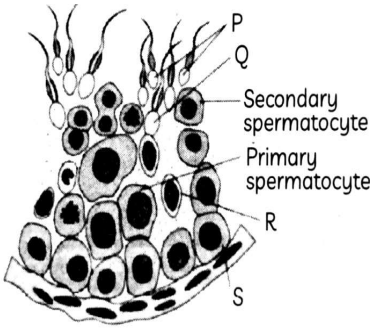
   a) Name the special cellular thickenings of synergids at the micropylar tip.

b) A typical angiospermic embryo sac, at maturity, though 8 nucleate is 7 celled. Justify.
c) Study the graph and find out the stage in the development of female gametophyte at which the cell wall formation will take place.

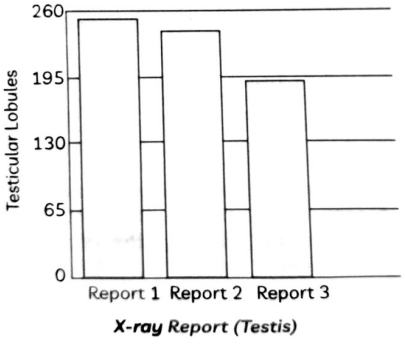
7. Why is manual transfer of desired pollen grains relatively easy in pea plants for hybridization, but in wheat, pollen grains are often utilized from pollen banks for hybridization purposes?
8. The path of sperm transport is given below. Provide the missing steps in blank boxes:



9. Describe the structure of a seminiferous tubule.
10. Cryptorchidism is a condition in which the testes fail to descend into the scrotum. It can also lead to compromised sertoli cell function and has an impact on leydig cell function.
    a) Identify atleast 03 parameters of male fertility which get affected due to cryptorchidism.
    b) Which process will be affected if mature spermatids are not released from sertoli cells?
11. Study the given diagram showing the sectional view of a seminiferous tubule.
    Answer the following question:



    a) Label P,Q, R and S in the figure.
    b) What will be the number of chromosomes in secondary spermatocyte ans spermatid respectively?
    c) Explain the term- spermiogenesis and spermiation.
12. What is:
    a) Tunica albuginea?
    b) Urethral meatus?
13. The male reproductive system consists of male accessory ducts, glands. The primary sex organs consist of a pair of testis. They are present in a sac like structure called scrotum. Scrotum maintains a lower temperature. The lower temperature is essential for spermatogenesis.
    a) Study the graph and help Ajay to find out, which of these reports concerning the X-ray of the testis in some random patients could be correct.



X-ray Report (Testis)

b) Which cells secrete male hormone testosterone?
c) What is the distal end of the penis called?

14. Enumerate the major components of the seminal plasma. Also mention about the accessory glands.
15. a) Draw a sectional view of seminiferous tubule of a human. Label the following cells in the seminiferous tubule:
    i) Cells that divide by mitosis to increase their number
    ii) Cells that undergo meiosis I.
    iii) Cells that undergo meiosis II.
    iv) Cells that help in the process of spermiogenesis.
    c) Mention the role of Leydig cells.

Question No. 16 to 20 consist of two statements – Assertion (A) and Reason (R). Answer these questions selecting the appropriate option given below:

a. Both A and R are true and R is the correct explanation of A.

b. Both A and R are true and R is not the correct explanation of A.

c. A is true but R is false.

d. A is False but R is true.

16. **Assertion (A):** Infundibulum is responsible for the collection of ovum after ovulation.
    Reason (R): Fimbriae help in the collection of ovum after ovulation.
17. **Assertion (A):** Not every copulation results into fertilization and pregnancy.
    Reason (R): When the sperms and the ovum are simultaneously transported to the ampullary-isthmic junction, only then fertilization can occur.
18. **Assertion (A):** Cells of tapetum have more than one nucleus.
    Reason (R): They undergo meiosis without cytokinesis.
19. **Assertion (A):** Apomictic seeds can maintain hybrid characters in the progeny.
    Reason (R): Apomixis prevents the segregation of characters in the next generation.
20. **Assertion (A):** The secretion of seminal vesicles is rich in fructose.
    Reason (R): Fructose provides energy for sperm motility.