**DAV PUBLIC SCHOOL CHANDRASEKHARPUR, BHUBANESWAR-21.**

**POST SUMMER VACATION TEST-2022-23**

**CLASS – XII**

 **SUB: BIOLOGY**

**Time:2Hours Maximum Marks:35**

**General Instructions:**

1. **There are 19 questions and five sections in the question paper. All questions are compulsory.**
2. **Section A** contains question numbers 1 to 6, case based, source based, Assertion and Reasoning and multiple choice questions of one mark each.

**Section B** contains question numbers 7 to 13, very short answer type questions of one mark each.

**Section C** contains question numbers 14 to 16, short answer type questions of two marks each.

**Section D** contains question numbers 17 to 18, long answer type I questions of three marks each.

**Section E** contains question number 19, long answer type II questions of five marks.

1. **There is no overall choice in the question paper. However, internal choices have been provided in some questions. Attempt one of the alternative in such questions.**
2. **Wherever necessary, neat, proportional and properly labelled diagram should be drawn.**

**SECTION –A**

Q1. Read the following and answer the questions from 1(i) to 1(iv) (1x4)

Pollen stigma compatibility is essential for successful pollination and fertilisation. Once compatible pollen is accepted by pistil, events of fertilisation proceed, whereas incompatible pollen will be rejected. This interaction where a pistil is able to recognise its pollen the result being the long-term pollen-pistil interaction and release of chemicals by pollen. Pollen pistil interaction is a dynamic process governed by a series of multiple alleles. Following compatible pollination, the pollen grain germinates on stigma to produce a pollen tube through one of the germ pores. In the journey of the pollen tube through stigma the generative cell divides to form two male gamates. After reaching the ovary the pollen tube enters the ovule through micropyle and then the filiform apparatus of one of the synergids guides the entry of pollen tube into the embryo sac. Subsequently double fertilisation occurs inside the embryo sac.

1. Find the wrong statement related to self-incompatibility
2. It is a device to prevent inbreeding depression.
3. It provides a bio-chemical block to self-fertilisation
4. It prevents non-self pollen from fertilising the ovules inhibiting pollen germination or pollen tube growth.
5. It is governed by series of multiple alleles.
6. All the events from the deposition of pollen grain on stigma to the entry of pollen tube into the ovule are referred to as \_\_\_\_\_\_\_\_\_ .
7. Fertilisation
8. Triple fusion
9. Pollen-pistil interaction
10. Syngamy
11. The pollen tube after reaching ovary enters into embryo sac through \_\_\_\_\_\_\_\_ .
12. Egg cell
13. Antipodals
14. Both the synergids
15. Any one synergid

iv. A particular species of plant produces light,non sticky pollen in large numbers and its stigma are long and feathery. These modifications facilitate pollination by

 a. insect b. water c. wind d. animals

2. Observer the diagram given below and answer the questions from 2(i) to 2(iii) (1x3)

i Fertilization membrane is formed to

a. Facilitate entry of sperm into egg

b. Provide stability to egg

c. Prevent monospermy

d. Prevent polyspermy

ii Cytoplasm of ovum does not possess

a. Golgi complex

b. Mitochondria

c. Centrosome

d. Ribosome

iii. Extrusion of second polar body occurs

a. After entry of sperm before completion of fertilization

b. After formation of Embryo

c. Before entry of sperm

d. Without any relation of sperm entry

Q3. Assertion- Homogamy refers to maturation of male and female sex organs at different times. 1

 Reason- This is a safeguard against cross fertilisation.

1. Both assertion and reason are true, and the reason is the correct explanation of assertion.
2. Both assertion and reason are true, but the reason is not the correct explanation of the assertion.
3. Assertion is true but reason is false.
4. Assertion is false but reason is true.

4. Assertion(A):Implantation takes place in the uterus during blastula stage. 1

 Reason (R):Blastula gets embedded to the endometrial lining between the second and fifth day following fertilization.

 a.Both assertion and reason are true, and reason is the correct explanation of assertion.

 b.Both assertion and reason are true, but reason is not the correct explanation of assertion.

 c.Assertion is true but reason is false.

 d. Assertion is false but reason is true.

 5. Which of the following not a function of progesterone? 1

 a. Gestation b. Inhibition of ovulation

c. Uterine growth and development d. stimulation of mammary secretion

6. Which is the correct statement related to artificial hybridisation. 1

1. Emasculation is the practice of the removal of bud.
2. Bagging prevents contamination from unwanted pollen grains.

c. Re-bagging helps in pollination of desired pollen grains on male plants.

d. Re-bagging has no significance in artificial hybridization.

**SECTION –B**

7. During reproduction, the chromosome number(2n) reduces to half (n) in the gametes and again resume the original number(2n) in the offspring, what are the processes through which these events take place? 1

8. Males in whom testes fails to descend to the scrotum are generally infertile. Why? 1

 9. Name the specific cell(s) in the mammary glands where milk is secreted and also name the hormone responsible for this. 1

10. How is it possible for *Oxalis* and *Viola* plants to produce assured seed set even in the absence of pollinators? 1

OR

 How do flowers of *Vallisneria* get pollinated? 1

11. *Papaver* and *Michelia* both have multi-carpellary ovaries. How do they differ from each other? 1

12. State the reason why pollen grains lose their viability when the tapetum in the anther is malfunctioning. 1

13. How many pollen grains and embryo sacs are likely to be formed in the anther and ovary of an angiosperm bearing 25 microspore mother cells and 25 megaspore mother cells respectively. 1

OR

The meiocyte of rice has 24 chromosomes. What will be the number of chromosomes in its endosperm and gametes?

**SECTION –C**

14. Why does corpus luteum secrete large amount of progesterone during luteal phase? Mention the fate of corpus luteum and its effect on the uterus in the absence of fertilization of ovum in a human female. 2

15. Give the schematic representation of the process of Oogenesis in a human female. 2

16. Geitonogamous flowering plants are genetically autogamous but functionally cross pollinated. Justify. 2

OR

A flower of brinjal plant following the process of sexual reproduction produces 240 viable seeds. Answer the following questions.

(a)How many ovules are minimally involved?

(b)How many megaspore mother cell are involved?

(c)What is the minimum no of pollen grains that must land on stigma for pollination?

 (d)How many microspore mother cells must have undergone reduction division prior to dehiscence of anther in the above case?

**SECTION –D**

17. As a senior biology student you have been asked to demonstrate to the students of secondary level in your school, the procedure(s) that shall ensure cross pollination in a hermaphrodite flower. List the different steps you would suggest and provide reasons for each one of them. 3

18. Draw a diagram of human sperm and lebel only those parts along with their functions, that assist the sperm to reach and gain entry into the female gamete. 3

OR

 Draw a diagram of an angiospermic embryo sac where fertilization has just completed. Label the following parts in it.

 i. Micropylar end of embryo sac

 ii. The part that develops into embryo

 iii. The part that develops into endosperm

 iv. The degenerating cells at the chalazal end

**SECTION –E**

19. (a)Describe the roles of pituitary and ovarian hormones during the menstrual cycle in a human female.

 (b)How can the scientific understanding of the menstrual cycle of human females help as a contraceptive measure? 5

OR

1. Why is the process of fertilization in angiosperms termed as double fertilisation? Explain.

b) Make a list of any three outbreeding devices that flowering plants have developed and explain how do they prevent self pollination?