



PANCHSHEEL PUBLIC SCHOOL
10+2 Senior Secondary School (Affiliated & Recognized by CBSE)
Jaitpur, Badarpur, New Delhi-44

Mid Term Revision Test 2023-24

Subject: BIOLOGY.

Time:

M. Marks : 50

Name.....

.....

RollNo.....

Class: XII

Section

General Instructions:

1. Section A has Questions 1-14 carry one mark each
2. Section B has Questions 15 – 19 carry two marks each
3. Section C has Question 20 -23 carry three marks each
4. Section D has Question 24 case study base question carry 4 Marks
4. Section C has Question 25- 26 carry five marks each.

Section A

1. Even in absence of pollinating agents seed-setting is assured in
 - (a) Commelina
 - (b) Zostera
 - (c) Salvia
 - (d) Fig
2. Feathery stigma occurs in
 - (a) pea
 - (b) wheat
 - (c) Datura
 - (d) Caesalpinia
3. A national level approach to build up a reproductively healthy society was taken up in our country in
 - (a) 1950s
 - (b) 1960s
 - (c) 1980s
 - (d) 1990s
4. The human chromosome with the highest and least number of genes in them are respectively
 - (a) chromosome 21 and Y
 - (b) chromosome 1 and X
 - (c) chromosome 1 and Y
 - (d) chromosome X and Y.

5. Male and female flowers are present on different plants (dioecious) to ensure xenogamy, in
 - (a) papaya
 - (b) bottle gourd
 - (c) maize
 - (d) all of these.

6. A reaction of granules content which harden the zona pellucida and ensures sure block to polyspermy is
 - (a) acrosomal reaction
 - (b) cortical reaction
 - (c) acrosin reaction
 - (d) bindin reaction.

7. Which part of the sperm plays an important role in penetrating the egg membrane
 - (a) Allosome
 - (b) Tail
 - (c) Autosome
 - (d) Acrosome

8. In oocyte secondary maturation occurs in
 - (a) ovary
 - (b) abdominal cavity
 - (c) Fallopian tube
 - (d) uterus.

9. Intensely lactating mothers do not generally conceive due to the
 - (a) suppression of gonadotropins
 - (b) hypersecretion of gonadotropins .
 - (c) suppression of gametic transport
 - (d) suppression of fertilisation.

10. Emergency contraceptives are effective if used within,
 - (a) 72 hrs of coitus
 - (b) 72 hrs of ovulation
 - (c) 72 hrs of menstruation
 - (d) 72 hrs of implantation.

11. In a dihybrid cross, if you get 9 : 3 : 3 : 1 ratio it denotes that
 - (a) the alleles of two genes are interacting with each other
 - (b) it is a multigenic inheritance
 - (c) it is a case of multiple allelism
 - (d) the alleles of two genes are segregating independently.

12. Which of the following will not result in variations among siblings ?
 - (a) Independent assortment of genes
 - (b) Crossing over

- (c) Linkage
- (d) Mutation

13. Mendel's Law of independent assortment holds good for genes situated on the

- (a) non-homologous chromosomes
- (b) homologous chromosomes
- (c) extra nuclear genetic element
- (d) same chromosome.

14. Which of the following statements is the most appropriate for sickle cell anaemia

- (a) It cannot be treated with iron supplements.
- (b) It is a molecular disease.
- (c) It confers resistance to acquiring malaria.
- (d) All of the above.

Section B:

15. Differentiate between spermiogenesis and spermiation.

16. With a neat, labelled diagram, describe the parts of a typical angiosperm ovule.

17. Suggest two methods to assist infertile couples in having children.

If the sequence of one strand of DNA is written as follows:

5' -ATGCATGCATGCATGCATGCATGC-3'

18. Write down the sequence of the complementary strand in a 5'→3' direction.

19. State the two principal outcomes of the experiments conducted by Louis Pasteur on origin of life.

Section C:

- 20. Explain the phases in embryonic development from the morula stage till the establishment of pregnancy in a human female.
- 21. A pregnant human female was advised to undergo MTP. It was diagnosed that the fetus she was carrying had developed from a zygote having 45 chromosomes with only one X chromosome. a) What is this condition called and how does it arise? b) Why was she advised to undergo MTP?
- 22. Identify the examples of homologous structures from the following
 - (i) Vertebrate hearts
 - (ii) Thorns in Bougainvillea and tendrils of Cucurbita.
 - (iii) Food storage organs in sweet potato and potato.
- 23. A diploid organism is heterozygous for 4 loci; how many types of gametes can be produced?

Section D :

Nondisjunction is the failure of homologous chromosomes to disjoin correctly during meiosis. It leads to the formation of a new cell with an abnormal amount of genetic material. A number of clinical conditions are the result of this type of chromosomal mutation. This results in the production of gametes containing a greater or lesser chromosomal amount than normal ones. Consequently, the individual may develop a trisomy or monosomal syndrome. Nondisjunction can occur in both Meiosis I and Meiosis II of the cellular division. It is also the main cause of many genetic disorders; however, its origin and process remain vague. Although it results in the majority of cases from errors in maternal meiosis II, both paternal and maternal meiosis I do influence it. Maternal age is considered a risk factor for trisomy, as well as recombination alterations and many others that can affect chromosomal segregation.

24.i. Which of the following conclusions can be true regarding aneuploidy?

- a. It is the presence of an extra chromosome in a diploid cell.
 - b. An aneuploid cell differs from other cells only in size.
 - c. It can be less number of chromosomes in a diploid cell.
 - d. Aneuploidy always affects female individuals.
- a. i only
 - b. both i and iii
 - c. both ii and iii
 - d. i, iii and iv

24.ii. Considering the different phases of meiosis, select the correct statements from the following.

- a. Errors in meiosis I is the only cause of aneuploidy
 - b. Aneuploidy always affects sex chromosomes.
 - c. Most of the aneuploidy results from errors in cell division involved in egg formation.
 - d. Nondisjunction in meiosis I can lead to more abnormal cells than disjunction in meiosis II.
- a. I only
 - b. both I and iii
 - c. both iii and iv
 - d. I, iii and iv

24.iii. By interpreting the graph of Down syndrome frequency and mothers' age, select the best conclusion(s) from the following options.

- a. Aneuploidy is not influenced by the mother's age.
- b. Delivery before 30 years of age can decrease the incidence of aneuploidy in most cases
- c. The chance of aneuploidy increases up to 22 years of age.
- d. There is a dramatic increase in aneuploidy if the maternal age exceeds 30

24.iv. The type of genetic disorders mainly caused by chromosomal non-disjunction is

- a. Chromosomal disorders
- b. Mendelian disorders
- c. Incomplete dominance
- d. All the above

Section E :

25. Given below is a stretch of DNA showing the coding strand of a structural gene of a transcription unit? 5'--ATG ACC GTA TTT TCT GTA GTG CCC GTA CTT CAG GCA TAA—3'
- a) Write the corresponding template strand and the mRNA strand that will be transcribed, along with its polarity. b) If GUA of the transcribed mRNA is an intron, depict the sequence involved in the formation of mRNA /the mature processed hnRNA strand. i. In a bacterium ii. In humans c) Upon translation, how many amino acids will the resulting polypeptide have? Justify.
26. Write the process of megasporogenesis in angiosperm plants.