CBSE
Class XII Biology
Sample Paper 2

Time: 3 Hours **Total Marks: 70**

General Instructions:

(i) All questions are compulsory.

(ii) The question paper has four sections: Section A, Section B, Section C and Section D. There are 33 questions in the question paper.

(iii) Section A 14 questions of 1 mark each and 02 case-based questions. Section B has 9 questions of 2 marks each. Section C has 5 questions of 3 marks each. Section D has 3 questions of 5 marks each.

(iv) There is no overall choice in the question paper. However, internal choices are provided in some questions. A student has to attempt only one of the alternatives in such questions.

(v) Wherever necessary, neat and properly labelled diagrams should be drawn.

Section A

1. Which structure is formed after the release of ova from Graafian follicles? [1]

2. What happens if pregnancy is not maintained in the human female? [1]

3. Expand MTP. [1]

4. What is the role of tapetum in the pollen-grain wall formation? [1]

5. Non-disjunction may lead to a zygote containing XXY sex chromosomes, what sex would this produce in Drosophila and in humans? [1]

6. Due to mistake during transcription, ATG forms UAG in mRNA. What change would occur in polypeptide chain translated by this mRNA? [1]

7. Mendel studied seven traits in garden pea. Which of the following were recessive? - Wrinkled seed, axial flower, yellow colour of pod. [1]

8. What is the main function of gene gun? [1]

9. Name any two techniques that serve the purpose of early diagnosis of some bacterial/viral human diseases. [1]

10. Give two examples of mutualism in living organisms. [1]

11. Assertion: The person heterozygous for sickle-cell trait produces both normal (HbA) and abnormal haemoglobin (HbS). [1]

Reason: The normal allele and the sickle allele are codominant.

a. Both assertion and reason are true, and reason is the correct explanation of the assertion.
b. Both assertion and reason are true, and reason is not the correct explanation of the assertion.
c. Assertion is true but reason is false.
d. Both assertion and reason are false.

OR

Assertion: A single mRNA strand is capable of forming a number of different polypeptide chains.

Reason: The mRNA strand has terminator codons.

a. Both assertion and reason are true, and reason is the correct explanation of the assertion.
b. Both assertion and reason are true, and reason is not the correct explanation of the assertion.
c. Assertion is true but reason is false.
d. Both assertion and reason are false.

12. Assertion: Plasmids are single stranded extrachromosomal DNA. [1]

Reason: Plasmids are usually present in eukaryotic cells.

a. Both assertion and reason are true, and reason is the correct explanation of the assertion.
b. Both assertion and reason are true, and reason is not the correct explanation of the assertion.
c. Assertion is true but reason is false.
d. Both assertion and reason are false.

13. Assertion: Animals adopt different strategies to survive in hostile environments.

Reason: Praying mantis is green in colour which merges with plant foliage. [1]

a. Both assertion and reason are true, and reason is the correct explanation of the assertion.
b. Both assertion and reason are true, and reason is not the correct explanation of the assertion.
c. Assertion is true but reason is false.
d. Both assertion and reason are false.

14. Assertion: When alien species are introduced unintentionally or deliberately for whatever purpose, some of them turn invasive, and cause decline or extinction of indigenous species. [1]

Reason: The recent illegal introduction of the African catfish *Clarias gariepinus* for aquaculture purposes is posing a threat to the indigenous catfishes in our rivers.

a. Both assertion and reason are true, and reason is the correct explanation of the assertion.
b. Both assertion and reason are true, and reason is not the correct explanation of the assertion.
c. Assertion is true but reason is false.
d. Both assertion and reason are false.

15. *Read the following and answer any four questions from 15 (i) to 15 (v) given below:* [4]

We use microbes or products derived from them in our everyday life. A common example is the production of curd from milk. Micro-organisms such as Lactobacillus and others commonly called lactic acid bacteria (LAB) grow in milk and convert it to curd. During growth, the LAB produces acids that coagulate and partially digest the milk proteins. A small amount of curd added to the fresh milk as inoculum or starter contain millions of LAB, which at suitable temperatures multiply, thus converting milk to curd, which also improves its nutritional quality by increasing vitamin B_{12}. LAB play very beneficial role in checking disease causing microbes in our stomach too.

(i) Probiotics are
   a. Food preservatives
   b. Food allergens
   c. Live microbial food supplement
   d. Safe antibiotics

(ii) Lactic acid is formed by the process of
   a. Fermentation
   b. Glycolysis
   c. Krebs cycle
   d. HMP Pathway

(iii) A small amount of _____ added to the fresh milk as inoculum or starter that contain millions of LAB, which at suitable temperatures multiply, thus converting milk to curd.
   a. Vinegar
   b. Curd
   c. Lactic acid
   d. Carbon dioxide

(iv) The dough which is used for making foods such as dosa and idli is fermented by _____.

a. Bacteria
b. Fungi
c. Protozoa
d. Virus

(v) **Assertion:** Different varieties of cheese are known by their characteristic texture, flavour and taste, the specificity coming from the microbes used.
Reason: The large holes in 'Swiss cheese' are due to production of a large amount of CO_2 by a bacterium named *Propionibacterium sharmanii*.

a. Both assertion and reason are true, and reason is the correct explanation of the assertion.
b. Both assertion and reason are true, and reason is not the correct explanation of the assertion.
c. Assertion is true but reason is false.
d. Both assertion and reason are false.

16. *Read the following and answer any four questions from 16 (i) to 16 (v) given below:* [4]

Chromosomal Disorders

The chromosomal disorders are caused due to absence or excess or abnormal arrangement of one or more chromosomes. Failure of segregation of chromatids during cell division cycle results in the gain or loss of a chromosome(s), called aneuploidy. Examples of chromosomal disorders include Down's syndrome and Turner's syndrome. Failure of cytokinesis after telophase stage of cell division results in an increase in a whole set of chromosomes in an organism and, this phenomenon is known as polyploidy. This condition is often seen in plants.
The total number of chromosomes of a normal human being is 46 (23 pairs). Out of these 22 pairs are autosomes and one pair of chromosomes are sex chromosome. Sometimes, though rarely, either an additional copy of a chromosome may be included in an individual or an individual may lack one of any one pair of chromosomes. These situations are known as trisomy or monosomy of a chromosome.

(i) Down's syndrome is due to:

a. Linkage
b. Sex-linked inheritance
c. Crossing over
d. Non-disjunction of chromosome

(ii) The cause of Down's syndrome is the presence of an additional copy of the chromosome number:
   a. 21
   b. 15
   c. 16
   d. 8

(iii) Which of the following is NOT correct symptom of Down's syndrome?
   a. Short statured
   b. Small round head
   c. Partially open mouth
   d. Rudimentary ovaries

(iv) _____ is caused due to the presence of an additional copy of X-chromosome resulting into a karyotype of 47, XXY.
   a. Down's Syndrome
   b. Klinefelter's Syndrome
   c. Turner's Syndrome
   d. Haemophilia

(v) _____ is caused due to the absence of one of the X chromosomes.
   a. Down's Syndrome
   b. Klinefelter's Syndrome
   c. Turner's Syndrome
   d. Haemophilia

Section B

17. Mention two points of difference between oogenesis and ovulation. [2]

18. If the base sequence of one strand of DNA is CAT, TAG, TAC, GAC, what will be the base sequence [2]
   (a) Of complementary DNA strand
   (b) Of its complementary RNA strand

19. What are the two causes of fever? [2]

20. What are sticky ends? Why are they named so? [2]

OR

How are restriction enzymes different from the topoisomerases functionally?

21. Name two commonly used bioreactors. State the importance of using a bioreactor.[2]

22.

(a) Tobacco plants are damaged severely when infested with *Meloidogyne incognitia*. Name and explain the strategy that is adopted to stop this infestation.

(b) Name the vector used for introducing the nematode specific gene in tobacco plant. [2]

OR

What are selectable markers? Give examples.

23. Explain why very small animals are rarely found in polar region. [2]

24. What do you mean by the term competition? Give an example. [2]

25. List any two adaptive features evolved in parasites enabling them to live successfully on their hosts. [2]

Section C

26. How is the progeny formed from asexual reproduction different from those formed by sexual reproduction? [3]

27. A pea plant with purple flowers was crossed with a plant with white flowers producing 40 plants with only purple flowers. On selfing, these plants produced 470 plants with purple flowers and 162 with white flowers. What genetic mechanisms account for these results? [3]

28. Name the pathogen, vector and symptoms of the disease Elephantiasis (Filariasis).[3]

29. How does the RNA interface help in developing resistance in tobacco plant against nematode infection? [3]

30. How do animals adapt to water scarcity in arid regions? [3]

Section D

31. What is spermiogenesis? Write the various changes which occur during this process? [5]

OR

(i) How are test tube babies different from the normally produced babies?

(ii) What is artificial insemination?

(iii) What are the possible causes of low sperm count?

(iv) What is the advantage of Saheli?

32. Describe briefly the mechanism of DNA replication. [5]

OR

Write the full names of the different types of RNA. State only how each type is involved in protein synthesis.

33. There is a non-specific type of immunity present at the time of birth. What is it called? Describe briefly the different lines of non-specific defence mechanism of our body. [5]

OR

Describe the structure of a biogas plant. Give various steps involved in obtaining biogas.