CBSE
Class XII Biology
Sample Paper 5

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. Name the hormones secreted by human placenta. [1]

2. How endosperm in angiosperms is produced during double fertilization? [1]

3. How does ovum move in the fallopian tube towards the uterus? [1]

4. At what stage of embryonic development, the zona pellucida envelop disintegrates? [1]

5. Why is human female called as homogametic? [1]

6. Which symbols are applied for male and female in pedigree analysis? [1]

7. Three codons on mRNA are not recognised by t-RNA. What are these three codons and what is the general term used for them? [1]

8. Why type II restriction enzymes are used in recombinant DNA technology? [1]

9. What is the function of ADA? [1]

10. Name the interactions in each of the following: [1]

i. Ascaris worms living in the intestine of humans.

ii. Sucker fish attached to the shark.

11. **Assertion:** Haemophilia shows criss-cross inheritance. [1]

Reason: The gene that causes haemophilia is recessive and lies in the sex (X) chromosome.

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: RNA was the first genetic material.

Reason: DNA has evolved from RNA by chemical modifications.

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: Insulin is an important life-saving drug for diabetic patients. [1]

Reason: It is now possible to produce insulin by using recombinant DNA technology.

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: Allelopathy is a form of ammensalism that occurs in plants. [1]

Reason: Association of rooting plants with fungal hyphae is an important example of ammensalism.

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: In in situ conservation, the endangered species are protected in their natural habitat. [1]

Reason: In situ conservation efforts are reflected in biosphere reserves, national parks, and wildlife sanctuaries.

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]

A wide range of organisms belonging to bacteria, viruses, fungi, protozoans, helminths, etc., could cause diseases in man. Such disease-causing organisms are called pathogens. All parasites are therefore pathogens as they cause harm to the host by living in (or on) them. The pathogens can enter our body by various means, multiply and interfere with normal vital activities, resulting in morphological and functional damage. Pathogens have to adapt to life within the environment of the host. For example, the pathogens that enter the gut must know a way of surviving in the stomach at low pH and resisting the various digestive enzymes.

(i) Name the pathogenic organism which causes typhoid fever in human beings.
   a. *Salmonella typhi*
   b. *Plasmodium vivax*
   c. *Streptococcus pneumoniae*
   d. *Haemophilus influenzae*

(ii) Which test is used to confirm the typhoid fever?
   a. ELISA
   b. Widal
   c. C-peptide
   d. Hb A1c

(iii) Which of the following disease is caused by Rhino virus in human beings?
   a. Amoebiasis
   b. Ringworm
   c. Common cold
   d. Malaria

(iv) The symptoms of which of the following disease include fever, chills, cough and headache?
   a. Pneumonia
   b. Amoebiasis
   c. Ringworm
   d. Elephantiasis

(v) **Assertion**: Entamoeba histolytica causes amoebiasis.
Reason: Symptoms of amoebiasis include fever, chills, cough and headache.
   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]

Mendel proposed two general rules to consolidate his understanding of inheritance in monohybrid crosses. These are called the Principles or Laws of Inheritance: the First Law or Law of Dominance and the Second Law or Law of Segregation. The law of dominance is used to explain the expression of only one of the parental characters in a monohybrid cross in the F_1 and the expression of both in the F_2. It also explains the proportion of 3:1 obtained at the F_2. The Law of Segregation is based on the fact that the alleles do not show any blending and that both the characters are recovered as such in the F_2 generation though one of these is not seen at the F_1 stage. Though the parents contain two alleles during gamete formation, the factors or alleles of a pair segregate from each other such that a gamete receives only one of the two factors. A homozygous parent produces all gametes that are similar while a heterozygous one produces two kinds of gametes each having one allele with equal proportion.

(i) In a dihybrid cross, pure homozygous plants will be
   a. 9
   b. 2
   c. 1
   d. 3

(ii) Mendel observed red flowers in F_1 generation, when he crossed red and white because of
   a. Dominance
   b. Recessive gene
   c. Law of independent assortment
   d. Law of segregation

(iii) The blood group containing anti A and anti B is
   a. Blood group A
   b. Blood group B
   c. Blood group AB
   d. Blood group O

(iv) A typical genotypic monohybrid ratio is
   a. 9:3:3:1
   b. 1:2:1
   c. 3:1
   d. 9:7

(v) Independent assortment of Mendel was proved by
   a. Monohybrid cross
   b. Dihybrid cross
   c. Incomplete dominance
   d. Back cross

Section B

17. Where are the Leydig cells present? What is their role in reproduction? [2]

18. What are the differences between monohybrid cross and reciprocal cross? [2]

19. Give the full name of the human disease in which the body loses its immunity generally towards infection. Mention any two ways by which this disease is transmitted. [2]

20. What is a gene gun? Give its utility. [2]

OR

What are the uses of biofertilizers?

21. List two options that can be considered for increasing food production. [2]

22. How can transgenic crops harm the environment? [2]

OR

Name the source organism that possesses *Taq* polymerase. What is so special about the function of this enzyme?

23. How do camels show unique adjustments to desert conditions? [2]

24. How do organisms which cannot migrate tend to overcome adverse environmental conditions? Explain taking one example each from vertebrates and angiosperms, respectively. [2]

25. What is predation? Give an example. [2]

Section C

26. Describe the post-fertilisation changes in a flower. [3]

27. In snapdragon, tall (DD) is dominant over dwarf (dd) and red flowers (RR) are incompletely dominant over white flowers (rr), the hybrid being pink flowers. A pure tall white is crossed with a pure dwarf red, and the F_1 is self-fertilised. Give the expected genotype and phenotype in the F_1 and F_2 generations. [3]

28. Give the pathogen, mode of transmission, symptoms and prevention of the disease Amoebiasis. [3]

29.

(a) Why are transgenic animals so called?

(b) With the help of an example, explain the role of transgenic animals in

(i) Vaccine safety

(ii) Biological products [3]

30. Explain three types of interspecific interactions. [3]

Section D

31.

(a) Draw a well labelled diagram of the structure of the human ovum.

(b) Which hormone stimulates the ovary to secrete progesterone for maintaining pregnancy?

(c) What is the function of relaxin hormone? [5]

OR

(a) Draw a diagram of a mature embryo sac of an angiosperm and label its following parts:

(i) Filiform apparatus

(ii) Synergids

(iii) Central cell

(iv) Egg cell

(v) Polar nuclei

(vi) Antipodals

(b) Write the fate of the egg cell and polar nuclei after fertilisation.

32. Name the scientists who proved experimentally that DNA is the genetic material. Describe their experiment. [5]

OR

Write the symptoms of haemophilia and sickle cell anaemia in humans. Explain how the inheritance pattern of the two diseases differs from each other.

33. What is biogas? Name the biomass and bacteria involved in the production of biogas. Give the various steps involved in obtaining biogas. [5]

OR

(i) Name any two diseases caused due to pathogenic microorganisms present in sewage.

(ii) What is biomagnification?

(iii) What is the reason for high concentration of DDT in human beings?

(iv) State two advantages of obtaining biogas from animal dung and biowastes.