Class 12 Biology Sample Question Paper Set-1

Class: XII **Subject:** Biology (044) **Academic Session:** 2026–27 **Time Allowed:** 3 Hours
Maximum Marks: 70

General Instructions

1. All questions are compulsory.
2. The question paper contains five sections: A, B, C, D and E.
3. Section A contains 16 questions of 1 mark each.
4. Section B contains 5 questions of 2 marks each.
5. Section C contains 7 questions of 3 marks each.
6. Section D contains 2 case-based questions of 4 marks each.
7. Section E contains 3 questions of 5 marks each.
8. Internal choices are provided in selected questions.
9. Draw neat and properly labelled diagrams wherever required.

SECTION A – Multiple Choice Questions (16 × 1 = 16 Marks)

Q1–Q12: Choose the correct option.

1. In a flowering plant, the pollen grains are released before the stigma becomes receptive. This condition is known as:

(A) Protandry (B) Protogyny (C) Homogamy (D) Cleistogamy

2. Which of the following hormones is responsible for maintaining the endometrium during pregnancy?

(A) FSH (B) LH (C) Progesterone (D) Oxytocin

3. In a cross between two heterozygous pink-flowered Snapdragon plants, the phenotypic ratio of offspring will be:

(A) 3 : 1 (B) 1 : 2 : 1 (C) 9 : 3 : 3 : 1 (D) 1 : 1

4. Which enzyme joins the Okazaki fragments during DNA replication?

(A) DNA helicase (B) DNA ligase (C) RNA polymerase (D) DNA primase

5. Which of the following represents the correct genotype of a person suffering from sickle-cell anaemia?

(A) HbA HbA (B) HbA HbS (C) HbS HbS (D) HbA HbB

6. The Hardy-Weinberg principle is represented by:

(A) $p + q = 1$ only (B) $p^2 + 2pq + q^2 = 1$ (C) $p^2 + q^2 = 0$ (D) $p + q = 0$

7. Which of the following is a bacterial disease?

(A) Malaria (B) AIDS (C) Typhoid (D) Ringworm

8. The microbes responsible for the production of biogas are mainly:

(A) Cyanobacteria (B) Methanogens (C) Lactobacillus (D) Yeast

9. Which enzyme is commonly used in PCR to synthesise DNA strands?

(A) DNA ligase (B) Taq polymerase (C) Restriction endonuclease (D) RNA polymerase

10. Bt cotton provides resistance against insect pests due to the production of:

(A) Insulin (B) Cry proteins (C) Interferons (D) Antibodies

11. Which population interaction benefits both participating species?

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(A) Predation (B) Parasitism (C) Mutualism (D) Competition

12. Which of the following is an example of ex-situ conservation?

(A) National park (B) Wildlife sanctuary (C) Sacred grove (D) Botanical garden

Q13–Q16: Assertion and Reason Questions

Choose the correct option:

(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.

13. Assertion: In human females, ovulation generally occurs around the middle of the menstrual cycle.

Reason: A sudden increase in LH level causes ovulation.

14. Assertion: DNA replication is called semiconservative replication.

Reason: Each newly formed DNA molecule contains one parental strand and one newly synthesised strand.

15. Assertion: Antibiotics are effective against all viral infections.

Reason: Antibiotics generally act against bacterial structures or metabolic processes.

16. Assertion: Energy flow in an ecosystem is unidirectional.

Reason: Energy lost as heat at each trophic level cannot be recycled back to the previous trophic level.

SECTION B – Very Short Answer Questions (5 × 2 = 10 Marks)

17. Differentiate between autogamy and geitonogamy on the basis of pollen transfer and genetic consequences.

OR

What are cleistogamous flowers? Explain how they ensure autogamy.

18. Why is DNA considered a better genetic material than RNA? Give any two reasons.

19. A person with blood group AB marries a person with blood group O.

(a) Write the genotypes of both parents.
(b) Mention the possible blood groups of their children.

20. Explain any two advantages of using biofertilisers in agriculture.

OR

What are mycorrhizae? Mention any two benefits they provide to plants.

21. A population of bacteria increases from 100 to 200 in a suitable nutrient medium.

(a) Identify the type of population growth if resources are unlimited.
(b) Write the mathematical expression for this growth model.

SECTION C – Short Answer Questions (7 × 3 = 21 Marks)

22. Explain the process of double fertilisation in flowering plants. Mention the ploidy of:

(a) Zygote
(b) Primary endosperm nucleus
(c) Synergids

23. Explain the three major phases of the menstrual cycle with the hormonal changes involved.

24. In a dihybrid cross between two heterozygous pea plants (RrYy × RrYy):

(a) Write the possible gametes produced by each parent.
(b) State the phenotypic ratio.
(c) Name the Mendelian law demonstrated.

25. Explain the process of transcription in a prokaryotic cell. Mention the roles of promoter, RNA polymerase and terminator.

26. Describe the three major steps involved in sewage treatment. Why is BOD an important parameter?

27. Explain the process of PCR. Name the three steps involved and the enzyme required.

28. Explain any three major causes of biodiversity loss, commonly called the 'Evil Quartet'.

SECTION D – Case-Based Questions (2 × 4 = 8 Marks)

29. Read the passage carefully and answer the following questions.

A couple visits a fertility clinic because they are unable to conceive naturally. Medical examination reveals that the female partner has healthy ovaries but blocked fallopian tubes. The male partner has a normal sperm count. The doctor suggests an assisted reproductive technology in which fertilisation takes place outside the female body, followed by the transfer of the early embryo into the fallopian tube or uterus, depending on its developmental stage.

Answer the following:

(a) What is the full form of IVF? (1)

(b) Name the technique in which an embryo with up to 8 blastomeres is transferred into the fallopian tube. (1)

(c) Differentiate between ZIFT and IUT on the basis of the developmental stage of the embryo transferred. (2)

30. Read the passage carefully and answer the following questions.

A forest ecosystem contains green plants, herbivores, carnivores and decomposers. Solar energy is captured by green plants through photosynthesis. Herbivores consume plants, while carnivores feed on herbivores. Dead organic matter is broken down by bacteria and fungi, returning nutrients to the soil.

Answer the following:

(a) Identify the primary producers in this ecosystem. (1)

(b) Which trophic level is occupied by herbivores? (1)

(c) Explain the 10% law of energy transfer with an example. (2)

SECTION E – Long Answer Questions (3 × 5 = 15 Marks)

31. Explain Mendel's dihybrid cross with a suitable example.

(a) Define a dihybrid cross. (1)

(b) Explain the parental and F1 generations. (2)

(c) Write the phenotypic ratio obtained in the F2 generation and state the law demonstrated. (2)

OR

Explain sex determination in humans with the help of a suitable cross. Why is the father responsible for determining the sex of the child?

32. Describe the steps involved in recombinant DNA technology.

Explain the role of the following:

(a) Restriction enzymes (b) DNA ligase (c) Cloning vectors (d) Competent host cells
(e) Selectable markers

OR

Explain the production of human insulin using recombinant DNA technology. Mention the role of A and B polypeptide chains.

33. Explain the different methods of biodiversity conservation.

(a) Define in-situ conservation. (1)

(b) Define ex-situ conservation. (1)

(c) Explain any three examples of biodiversity conservation methods. (3)

OR

Explain the four major causes of biodiversity loss. How can these threats be controlled through conservation measures?

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