Roll No. ☐☐☐☐☐☐☐☐

Q.P. Code 57/1/1

BIOLOGY (THEORY)

CBSE Class XII Board Examination 2026

Time allowed: 3 hours **Maximum Marks: 70**

General Instructions:

1. The paper has 33 questions in five sections (A to E); all questions are compulsory.
2. Section A: Q1–16 are multiple-choice / assertion-reason questions of 1 mark each.
3. Section B: Q17–21 are very short answer questions of 2 marks each.
4. Section C: Q22–28 are short answer questions of 3 marks each.
5. Section D: Q29–30 are case-based questions of 4 marks each, with an internal choice in one sub-part.
6. Section E: Q31–33 are long answer questions of 5 marks each.
7. There is no overall choice, but some questions have internal choices — answer only one alternative. Draw neat, labelled diagrams wherever needed.

SECTION A

Q1–16 carry 1 mark each (MCQ; Q13–16 Assertion-Reason).

1. For artificial hybridisation, in which of these plants is emasculation NOT needed? **1**

(A) Rice **(B)** Wheat

(C) Pea **(D)** Papaya

2. Which one of these is NOT a part of the human immune system? **1**

(A) Lymphocytes **(B)** Plasma proteins

(C) Red blood cells **(D)** Bone marrow

3. Pick the option that gives the correct statements about the menstrual cycle: **1**

(i) The corpus luteum secretes progesterone.

(ii) Only FSH reaches a peak in the middle of the cycle.

(iii) The LH surge causes the Graafian follicle to rupture.

(iv) The luteal phase is also known as the proliferative phase.

(A) Only (ii) is correct **(B)** (i) and (iii) are correct

(C) Only (iv) is correct **(D)** (ii) and (iv) are correct

4. Which pair is wrongly matched? **1**

(A) Number of mega-diversity countries in the world – 12

(B) Genetically different strains of rice in India – fewer than 1000

(C) Robert May's estimate of global species diversity – about 7 million species

(D) Zoological parks – ex situ conservation

5. The hybrid plant 'Pomato' was obtained by the fusion of protoplasts of: **1**

(A) Tomato and potato **(B)** Pomegranate and tomato

(C) Pomegranate and potato **(D)** Pomegranate, potato and tomato

6. In an ecosystem, different species occupy different vertical levels. This vertical distribution of species is termed: **1**

(A) Stratification **(B)** Layering

(C) Fragmentation **(D)** Population

7. Which of these sacred grove regions lies in Meghalaya? **1**

(A) Jaintia hills **(B)** Bastar

(C) Chanda **(D)** Sarguja

8. A figure shows a cell with two homologous chromosome pairs (one carrying A/a, the other B/b). Two equally likely arrangements at Metaphase I are drawn: in Possibility 1 the A and B chromosomes line up on the same side, in Possibility 2 the A and b chromosomes line up on the same side. After meiosis these give four gamete combinations: AB, ab, Ab and aB. Which phenomenon does this show? **1**

(A) Linkage of genes
(B) Independent assortment of genes
(C) Multiple alleles
(D) Incomplete dominance

9. Match Column I with Column II: **1**
Column I: a. Biolistic gun b. Chitinase c. Ti d. Ca^{++}
Column II: i. Bacterial cell ii. Tumour inducing iii. Animal cell iv. Fungal cell v. Plant cell

(A) a-i, b-ii, c-iii, d-iv
(B) a-ii, b-v, c-i, d-iii
(C) a-v, b-iv, c-ii, d-i
(D) a-v, b-i, c-iv, d-ii

10. Who proposed that the use and disuse of organs drives the evolution of organisms? **1**

(A) Charles Darwin
(B) Thomas Malthus
(C) Hugo de Vries
(D) Lamarck

11. Which statement about plasmids is NOT correct? **1**

(A) Plasmids can replicate inside the bacterial cell.
(B) Their replication is controlled by the chromosomal DNA.
(C) They are circular extra-chromosomal DNA that replicates autonomously.
(D) They often carry genes for antibiotic resistance.

12. Which type of connective tissue attaches the ovary to the pelvic wall and the uterus? **1**

(A) Tendons
(B) Ligaments
(C) Cartilage
(D) Bone

13. Assertion (A): After the Industrial Revolution, the number of melanised (dark) moths went up in industrial areas. **1**
Reason (R): In industrial areas, lichen-covered tree trunks were replaced by soot-covered trunks, which camouflaged dark moths better.

(A) Both A and R are true and R is the correct explanation of A.
(B) Both A and R are true but R is not the correct explanation of A.
(C) A is true but R is false.
(D) A is false but R is true.

14. Assertion (A): Milk from the transgenic cow 'Rosie' was a nutritionally more balanced product for human babies than ordinary cow milk. **1**

Reason (R): The milk was enriched with the human protein alpha-lactaglobulin.

(A) Both A and R are true and R is the correct explanation of A.

(B) Both A and R are true but R is not the correct explanation of A.

(C) A is true but R is false.

(D) A is false but R is true.

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15. Assertion (A): In secondary sewage treatment, flocs are masses of bacteria held together with fungal filaments. **1**

Reason (R): Flocs digest the solid waste by anaerobic respiration.

(A) Both A and R are true and R is the correct explanation of A.

(B) Both A and R are true but R is not the correct explanation of A.

(C) A is true but R is false.

(D) A is false but R is true.

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16. Assertion (A): In a terrestrial ecosystem, a much larger fraction of energy flows through the grazing food chain. **1**

Reason (R): The grazing food chain may be linked to the detritus food chain at some levels.

(A) Both A and R are true and R is the correct explanation of A.

(B) Both A and R are true but R is not the correct explanation of A.

(C) A is true but R is false.

(D) A is false but R is true.

SECTION B

Q17–21 are very short answer questions of 2 marks each.

17. (a) What is meant by the humoral immune response? **2**
(b) Name any two kinds of antibodies that take part in the humoral immune response in humans.

18. (i) How can a farmer benefit from the dormancy of seeds? **2**
(ii) Give one difference between a pea seed and a castor seed.

OR

In which follicle stage does the primary oocyte complete its first meiotic division? What are the products formed by this division?

19. A DNA segment has the base sequence **2**
5' – GAATTC – 3'
3' – CTTAAG – 5'
(a) What is such a sequence called, and which enzyme recognises it?
(b) How do such enzymes act on DNA?

20. Two sex-determination systems are described: **2**
Case I: males are XO and females are XX.
Case II: females are ZW and males are ZZ.
Name the type of heterogamety in each case and give one example of each.

OR

(i) Give one difference between a DNA nucleotide and an RNA nucleotide.
(ii) Name the two kinds of bonds found within a single nucleotide.

21. A pyramid of standing crop is drawn with two bars: the lower bar (PP, primary producers) is narrow and the upper bar (PC, primary consumers) is wider. **2**
(i) Name this type of pyramid and, with an example, explain where such a pyramid occurs in nature.
(ii) State any two limitations of ecological pyramids.

OR

A development project caused loss of biodiversity in an area.
(i) Give two ways in which the ecosystem will be affected.
(ii) Name two major causes of biodiversity loss.

SECTION C

Q22–28 are short answer questions of 3 marks each.

22. (a) Do pollen grains of all plants stay viable for the same time? Justify with two examples. **3**
(b) How are pollen grains preserved in pollen banks?

23. (a) What is pedigree analysis? Give its importance in human genetics (two points). **3**
(b) A pedigree shows: an unaffected father and unaffected mother have six children – a normal son, an affected son, a normal son, a normal daughter, an affected daughter and a normal son. The normal daughter marries a normal man and they have an affected son and two normal daughters. Write (i) the mode of inheritance shown, and (ii) one disease inherited in this way.

24. (a) Show how the Hardy–Weinberg expression $p^2 + 2pq + q^2 = 1$ is obtained. **3**
(b) Name any two factors that upset genetic equilibrium.

25. Draw a well-labelled diagram of an angiosperm megasporangium (ovule) and label any six parts. **3**

26. (a) Give the scientific name of the plant that is the source of opioids and the part from which they are obtained. **3**
(b) How are morphine and heroin chemically related? State the effect of each on the body.

27. A farmer grows ordinary corn in field A and genetically modified (GM) corn in field B. Corn borers attack only field A, so he sprays Bt spores on field A. **3**
(a) Which gene in the spores is responsible for killing the pest?
(b) How do the Bt spores act on the insect?
(c) Explain how the corn in field B became resistant to this pest.

28. A DNA mixture with fragments from 100 bp to 1800 bp was run on an agarose gel. In the first set-up the wells were at the top, next to the positive electrode, and the negative electrode was at the bottom. **3**
(a) What will be seen after staining with ethidium bromide? Explain why.
(b) The set-up was changed so that the wells were next to the negative electrode and the positive electrode was at the bottom. Now bands appeared and a 100 bp band was seen at position X, the farthest from the wells. What change was made, and why is the 100 bp band at X?

SECTION D

Q29–30 are case-based questions of 4 marks each, with an internal choice in one sub-part.

29. On a rocky sea shore, two barnacles are found in zones: Chthamalus stellatus in the upper intertidal zone (where Balanus dries out) and Balanus balanoides in the middle intertidal zone, where it out-competes Chthamalus for space; in the lower zone Balanus is eaten by predators. When Balanus is removed experimentally, Chthamalus spreads into the lower zones. **4**

(a) Name and define the ecological phenomenon shown by this observation. (1)

(b) Two different species can compete for the same resource. Give one more example. (1)

(c) How do species avoid competition in nature? Explain with an example. (2)

OR

(a) (a) State the principle that explains the elimination of one of the competing species.

30. A student made three crosses in a plant for height (Tall/Dwarf) and drew a bar graph of the progeny: Cross I – 500 tall, 0 dwarf; Cross II – 375 tall, 125 dwarf; Cross III – 250 tall, 250 dwarf. **4**

(a) What can you conclude about the genotypes of the parents in crosses I and II? (1)

(b) From the graph of cross III, name the type of cross and state its importance in genetics. (2)

(c) What conclusion follows from crosses I and II? Name the genetic principle shown. (1)

OR

(a) (a) Which kind of genetic cross do these crosses represent?

SECTION E

Q31–33 are long answer questions of 5 marks each.

31. Describe the events in the human female from fertilisation up to implantation of the blastocyst. Also state where fertilisation occurs. **5**

OR

(i) Some couples cannot have children though they use no contraception. They do not want to adopt or use donor gametes. Suggest a suitable assisted reproductive technology for each:
Case I – Woman: normal reports. Man: normal sperms but the epididymis is not connected to the vas deferens.
Case II – Woman: normal eggs but blocked fallopian tubes. Man: normal sperms.
Case III – Woman: normal reports. Man: low sperm count and poor motility.
(ii) Copper-releasing IUDs are very effective, popular contraceptives. Name two of them and give two reasons why they work well.

32. (i) Watson and Crick's double-helix model was based on two earlier findings. Name them and the scientists linked with each. **5**
(ii) Write any three main features of the double-helix structure of DNA.

OR

The coding strand of the structural gene of a transcription unit is:
5' – ATG ACC GTA TTT TCT GTA GTG CCC GTA CTT CAG GCA TTA – 3'
(i) Write the template strand and the mRNA transcribed from it, showing polarity.
(ii) If GUA in the transcribed RNA is an intron, write the sequence of the mature (processed) mRNA formed (1) in a bacterium (2) in humans.
(iii) How many amino acids will the polypeptide made in humans contain?

33. (i) Which species of protozoan causes the most serious, even fatal, form of malaria? **5**
(ii) In which host does the parasite complete its sexual stages? Describe the changes that take place there.
(iii) How does the parasite harm the human body after it enters the blood?
(iv) Suggest two effective measures to prevent the spread of the disease in endemic areas.

OR

(i) What are biofertilisers?
(ii) Name the different groups of microbes used as biofertilisers in organic farming and explain how each improves soil fertility.
(iii) Give two advantages of biofertilisers over chemical fertilisers.

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Questions restated from the CBSE Class XII Board Examination 2026 (set 57/1/1) for practice. Reading passages and map items are described, not reproduced.