

ISC Class 12 • Biology

Important Questions 2027

Most repeated questions from the last few years of board and sample papers, grouped chapter-wise.

Sexual Reproduction in Flowering Plants

1. If the number of chromosomes in the cells of the calyx is 16, how many chromosomes will be formed in the endosperm after double fertilisation?

Seen in: Board 2025, 2026 · Sample 2025, 2026

2. In a particular plant with bilobed ditheous anther, there were 50 Pollen Mother Cells. Only 25% could develop their pollen tubes. Calculate the number of pollen grains that would proceed for fertilisation.

Seen in: Board 2026 · Sample 2026

3. Draw a well labelled diagram of L.S of anatropous ovule.

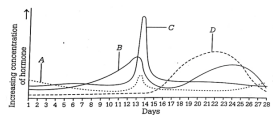
Seen in: Board 2023 · Sample 2024

4. (a) Discuss any three contrivances for prevention of self-pollination in flowering plants. (b) Oranges can be produced by processes like Apomixis and Polyembryony. State two differences between these processes.

Seen in: Board 2023, 2025

Human Reproduction

5. (i) The following graph represents the relative concentrations of the four hormones present in the blood plasma of a woman during her menstrual cycle. Identify the hormones A, B, C and D.
(ii) During a fertility consultation, a woman mentions her menstrual cycle lasts for 33 days regularly. To help her conceive, the doctor advised her to track ovulation. On which day of the menstrual cycle is she most likely to ovulate?

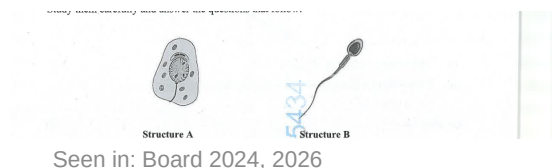


Seen in: Board 2023 · Sample 2024, 2026

6. Draw a neat and well labelled diagram of T.S. of mammalian testis.

Seen in: Board 2025 · Sample 2024

7. The two structures shown below are formed in the process of spermatogenesis (Structure A and Structure B). (i) Identify the process which converts Structure A to Structure B. (ii) State any two modifications observable in Structure B.



Reproductive Health

8. Give a reason: The period of lactational amenorrhoea is marked by the absence of menstruation.

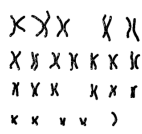
Seen in: Board 2025 · Sample 2023, 2024

9. As a volunteer for an awareness programme in rural areas, you have been asked to design a poster on sexual health, highlighting birth control options available to males. What two contraceptive methods for males will you highlight in the poster that have negligible chances of failure? Mention the working principle for each method.

Seen in: Sample 2024, 2026

Principles of Inheritance and Variation

10. Shown below is the karyotype of an individual (47 chromosomes with extra sex chromosome).
 (i) State one characteristic reproductive feature and one physical attribute of such an individual.
 (ii) What is the category of such disorders called? Which abnormality during cell division causes such disorders?



Seen in: Board 2026 · Sample 2024

11. A male plant, bearing red flowers, was crossed with a female plant bearing yellow flowers. In the F₁ generation, all the flowers were orange in colour. (i) Give a reason to explain the change of colours in F₁ generation. (ii) Mention the ratio of red flowers, yellow flowers and orange flowers in the F₂ generation.

Seen in: Board 2024 · Sample 2024

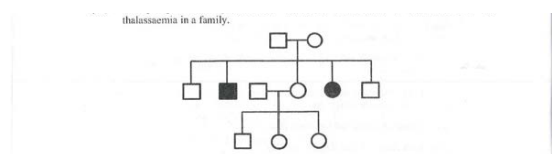
- 12.** Consider the information given below about a family. Rafiq, a ten year old boy, injured himself badly and bleeding could not be stopped. His uncle had lost his life in a similar condition. Rafiq's family underwent genetic analysis to detect Bleeder's disease; his parents, sister Farah and paternal grandmother were tested. Rafiq's mother and grandmother were found to be carriers of the Bleeder's disease. (i) Draw a single pedigree chart to show the pattern of inheritance in Rafiq's family. (ii) What kind of inheritance pattern prevails in Rafiq's family? (iii) What are the chances of (a) Farah suffering from the same disease? (b) Farah being a carrier of the same disease?

Seen in: Board 2024, 2025

- 13.** The maternal grandfather of a boy is colourblind, but his maternal grandmother is normal. The father of the boy is also normal. What is the probability of this boy being colourblind?

Seen in: Board 2023 · Sample 2023

- 14.** The pedigree chart given below represents the pattern of inheritance of thalassaemia in a family. What could be the genotype of the affected male?



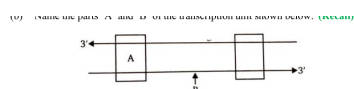
Seen in: Board 2023, 2024

Molecular Basis of Inheritance

- 15.** Assertion: An amino acid in polypeptide chain is not always altered even due to change in the third nitrogenous base of codon. Reason: The amino acid does not change due to degeneracy of genetic code. (a) Both Assertion and Reason are true and Reason is the correct explanation for Assertion. (b) Both Assertion and Reason are true but Reason is not the correct explanation for Assertion. (c) Assertion is true and Reason is false. (d) Both Assertion and Reason are false.

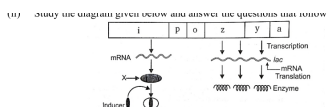
Seen in: Board 2024 · Sample 2026

- 16.** (a) Write a brief note on Griffith's experiment. What was the conclusion drawn from this experiment? (b) Name the parts 'A' and 'B' of the transcription unit shown below (3' to 3' with A block and B).



Seen in: Board 2024 · Sample 2026

17. OR Study the diagram (lac operon: i, p, o, z, y, a with mRNA, X, Inducer, Transcription, Translation, Enzyme) and answer: (a) Name the molecule 'X' synthesised by 'I' gene. How does this molecule get inactivated? (b) Name the enzymes coded respectively by genes z, y, and a. (c) Which enzyme binds to the operator to initiate transcription?



Seen in: Board 2023 · Sample 2026

18. (i) An organism living at an extremely hot place is likely to have a high GC content in its DNA. Give a reason to explain. (ii) If you are given the exact quantity of G and T, how will you calculate the quantity of A and C in the DNA? Why is this not possible in the RNA molecule?

Seen in: Board 2025 · Sample 2023

Evolution

19. OR (a) The recessive allele 'b' occurs with a frequency of 0.8 in a population of moths that is in Hardy Weinberg Equilibrium. What is the frequency of homozygous dominant individuals? (b) List any two differences between Homo habilis and Homo erectus.

Seen in: Board 2024, 2025 · Sample 2024, 2025, 2026

20. Why are tendrils of vine (Vitis) and pea (Pisum) considered to be analogous organs?

Seen in: Board 2025 · Sample 2026

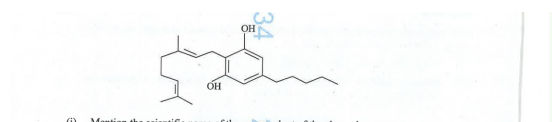
Human Health and Diseases

21. Shama complained of severe itching in certain parts of her body where patches as shown below appeared on her skin. Write the biological name of the causative agent responsible for her condition.



Seen in: Board 2026 · Sample 2026

22. Study the chemical structure of an addictive drug shown below (cannabinoid) and answer: (i) Mention the scientific name of the source plant of the above drug. (ii) State any one effect of this drug on human body. (iii) What is meant by withdrawal symptom?



(i) Mention the scientific name of the source plant of the above drug.
Seen in: Board 2025, 2026

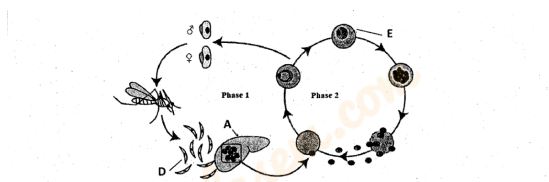
23. If a person shows the production of interferons in his body, then he is suffering from: (a) Malaria (b) Ring worm (c) Dengue (d) Typhoid

Seen in: Board 2024 · Sample 2024

24. In human plasma, five different types of immunoglobulins are found. Which type of immunoglobulin is responsible for allergic reactions?

Seen in: Board 2024 · Sample 2023

25. The diagram given below shows the life cycle of a malarial parasite. Study it carefully and answer: (i) Name the hosts in which the asexual phase and sexual phase of the life cycle take place. (ii) Identify the infective stage labelled 'D'. (iii) Name the structures labelled 'A' and 'E'. (iv) Give any one symptom of malaria.



Seen in: Board 2023, 2026

26. Assertion: A person who has received a cut from a sharp object and is bleeding, needs to be given an anti-tetanus injection. Reason: Anti-tetanus injection stimulates the production of antibodies for tetanus. (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) Both Assertion and Reason are false.

Seen in: Board 2023 · Sample 2023

27. Expand the abbreviation NACO.

Seen in: Board 2023, 2024

Microbes in Human Welfare

28. Ravi wanted to grow rice in his field. He was very concerned about environment degradation, so he did not want to use chemical fertilisers. Suggest a suitable biological method to Ravi.

Seen in: Sample 2025, 2026

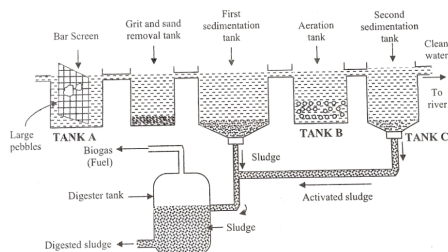
29. Microbes especially yeasts have been used for the production of beverages like wine, beer, whisky, brandy, or rum. Depending on the type of raw materials used for fermentation and type of processing (with or without distillation) different types of alcoholic drinks are obtained. (i) Mention the scientific name of the organism used to prepare fermented beverages. (ii) Name any one beverage obtained without distillation of fermented broth.

Seen in: Sample 2023, 2026

30. (a) Why are the biocontrol agents preferred over the chemical pesticides? (b) Explain the role of any two biocontrol agents by mentioning their target pests.

Seen in: Sample 2023, 2025

- 31.** Microbes have been used by humans in household, industrial and agricultural setups. One such use is shown in the diagram given below (sewage treatment: Bar Screen, Grit and sand removal tank, sedimentation tanks, Aeration tank, Digester tank with Biogas). (i) Tank A represents primary treatment of sewage while Tank B shows its secondary treatment. State one difference between the two kinds of sewage treatment. (ii) Identify the tank in which flocs are added. (iii) What is the purpose of using microbes in sewage treatment?



Seen in: Board 2023, 2025

Biotechnology: Principles and Processes

- 32.** A scientist isolates a second restriction endonuclease from the strain DC3 of *Helicobacter pylori*. What would the scientist name it using the standard naming technique of restriction enzyme?

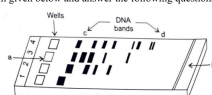
Seen in: Board 2025, 2026 · Sample 2026

- 33.** Renu was conducting an experiment. She started with a single DNA strand and ran six cycles of PCR to produce number of molecules of DNA.

Seen in: Sample 2025, 2026

- 34.** Study the diagram (gel electrophoresis apparatus with wells and DNA bands) and answer: (i) Identify the anode end in the diagram. (ii) How are these DNA fragments visualised?

Study the diagram given below and answer the following questions:



(i) Identify the anode end in the diagram

(Anode)

Seen in: Board 2024 · Sample 2026

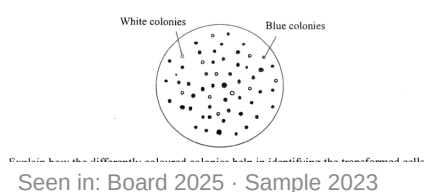
- 35.** Write a 6-nucleotide long palindromic sequence on a double stranded DNA, which was reverse transcribed by the following nucleotide sequence on a retroviral RNA. 3'-GUA- - - 5'

Seen in: Sample 2023, 2025

- 36.** Anthony is a scientist who has been provided with raw materials to obtain a specific biological product in large quantities. His laboratory has two large vessels for this purpose - one with a sparger and the other vessel with a stirrer. Which vessel will be more advantageous to Anthony? Why?

Seen in: Board 2026 · Sample 2023

37. The diagram given below shows a method of screening the transformed bacterial cells (White colonies and Blue colonies). Explain how the differently coloured colonies help in identifying the transformed cells.

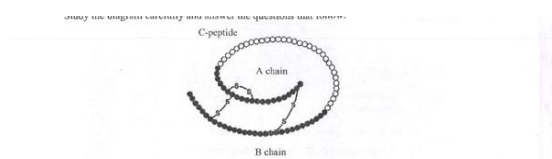


38. Observe the relationship between the first two words / terms and then fill in the fourth word / term. Lipase: Candida lipolytica :: Taq polymerase: _____.

Seen in: Board 2023, 2025

Biotechnology and its Applications

39. The diagram given below represents the schematic structure of proinsulin (C-peptide, A chain, B chain) which undergoes certain modifications before it becomes a fully functional insulin. (i) State the change the proinsulin undergoes to become fully functional. (ii) Name the modern scientific technique used for the production of human insulin. (iii) How are the two polypeptide chains of the fully functional insulin held together?



40. Give a reason: Kanika was suffering from SCID and needed periodic infusion of transformed lymphocytes.

Seen in: Board 2023, 2024, 2026

41. Name the technique used to detect the presence of HIV in the body of an individual. Justify the principle associated with this technique.

Seen in: Sample 2023, 2025

42. Assertion: RNAi technique is applied to plants and animals to protect them from pest infestation. Reason: This technique inhibits the expression of certain genes in pests. (a) Both Assertion and Reason are true and Reason is the correct explanation for Assertion. (b) Both Assertion and Reason are true but Reason is not the correct explanation for Assertion. (c) Assertion is true and Reason is false. (d) Both Assertion and Reason are false.

Seen in: Board 2026 · Sample 2024

Organisms and Populations

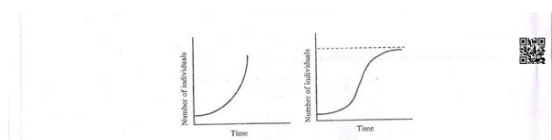
- 43.** OR Roselin had an aquarium at her home with 10 fish in it. In a year, a fish gave birth to 7 fish. During this period, 3 adult fish had died. Roselin's father purchased 2 more pairs of fish from market for the aquarium. Later, Roselin gifted 4 fish from the aquarium to her friend. Find out the growth rate of fish in Roselin's aquarium.

Seen in: Board 2026 · Sample 2024, 2026

- 44.** There were 770 frogs in a pond. 70 of them died within a month. Calculate the death rate of the population of frogs in the pond.

Seen in: Board 2024, 2025, 2026

- 45.** Study the two figures shown below that represent two growth models (Figure A, Figure B). (i) Which one of the two figures represents an unlimited supply of nutrients? Give a reason. (ii) Which figure depicts a challenge to population growth? (iii) Explain the term reproductive fitness. (iv) Give the mathematical expressions for Figure A and Figure B.



Seen in: Board 2024, 2025, 2026

- 46.** *Paramecium caudatum* and *Paramecium aurelia* were growing in separate culture media in a laboratory. When both the species were transferred to the same culture medium for growth, it was observed that *Paramecium caudatum* got eliminated from the habitat after some time. Identify and explain the type of ecological interaction between the aforementioned species of *Paramecia* on the basis of Gause's principle.

Seen in: Board 2026 · Sample 2025

- 47.** A population pyramid is a graphic representation of the distribution of a population by age groups. Diagrammatically represent the three kinds of age pyramids.

Seen in: Board 2023 · Sample 2026

- 48.** OR What is parasitism in population interactions? Explain any two types of parasitism with one example each.

Seen in: Board 2025 · Sample 2024

- 49.** Some orchids live on the branches of mango trees. Name the type of interaction that exists between mango tree and the orchid.

Seen in: Board 2024 · Sample 2024

Ecosystem

- 50.** The amount of energy at the fourth trophic level in the food chain given below is 4 J. Grass → Zebra → Crocodile → Vulture. What will be the amount of energy available at the sunlight and transducer level?

Seen in: Board 2026 · Sample 2025, 2026

- 51.** A forest has a GPP of $20,000 \text{ kcal/m}^2/\text{year}$, and 40% of this energy is used for respiration. Calculate the amount of energy available as NPP.

Seen in: Board 2025 · Sample 2023, 2024

- 52.** Construct a pyramid of numbers for an ecosystem in which a single large aquatic plant supports a population of small herbivorous fish, which are consumed by a larger population of predatory fish such as kingfish.

Seen in: Sample 2023, 2026

- 53.** Name the scientist who is considered the Father of Indian Ecology.

Seen in: Board 2023, 2025

Biodiversity and its Conservation

- 54.** During a field excursion, a group of class XII students visited Kaziranga National Park and observed efforts to protect the Indian rhinoceros in its natural habitat. They also toured a botanical garden and a gene bank, where they saw endangered plant species and preserved seeds. (i) Name and define the two types of conservation methods mentioned above. (ii) What is cryopreservation? (iii) Is Captive breeding an ex-situ or an in-situ strategy. Justify your answer with a reason.

Seen in: Sample 2023, 2025, 2026

- 55.** A biologist surveyed islands of different sizes and consolidated the results. Name of Islands / Island Area (sq. km) / No. of mammalian species: P/1/5, Q/10/18, R/100/60, S/1000/150. (i) What pattern do you observe in the above data? (ii) Name the scientist who proposed the concept of relationship between area and species. (iii) Write the mathematical expression for this relationship.

Seen in: Board 2024, 2026 · Sample 2025

- 56.** Name any two factors responsible for the loss of biodiversity in a geographical region.

Seen in: Board 2023 · Sample 2024, 2025

- 57.** (i) Explain the Rivet Popper Hypothesis. (ii) Briefly discuss the narrowly utilitarian and broadly utilitarian arguments for conserving biodiversity.

Seen in: Board 2025 · Sample 2023