Master Testing Agency
Practice papers, exam-standard · www.mastertestingagency.com

Biodiversity and its Conservation — CBSE Class 12 Biology Chapter Test

FREE CHAPTER TEST · CLASS XII · BIOLOGY (044) · PATTERN OF THE CBSE SAMPLE QUESTION PAPER 2026-27

TIME ALLOWED	MAXIMUM MARKS	QUESTIONS	NAME / ROLL NO.
1½ hours	37	17 (A 8 · B 3 · C 3 · D 1 · E 2)	

GENERAL INSTRUCTIONS

Read the following instructions very carefully and strictly follow them:

1. This question paper contains 17 questions. All questions are compulsory.
2. This question paper is divided into five sections: A, B, C, D and E.
3. Section A (Q1–8) contains 6 multiple choice questions and 2 assertion-reason based questions of 1 mark each.
4. Section B (Q9–11) contains short answer questions of 2 marks each.
5. Section C (Q12–14) contains short answer questions of 3 marks each.
6. Section D (Q15) contains case-based questions of 4 marks each, with sub-parts of 1, 2 and 1 marks.
7. Section E (Q16–17) contains long answer questions of 5 marks each.
8. There is no overall choice. However, an internal choice has been provided in 2 questions in Section B, 1 question in Section D, 2 questions in Section E. Attempt only one of the alternatives in such questions.
9. Draw neat, labelled diagrams wherever necessary.
10. This chapter test follows the section structure, question types and marks per question of the CBSE Class XII Biology (044) Sample Question Paper 2026-27, at about half the length of the 70-mark board paper: 37 marks in 1½ hours.
11. The answer key and the marking scheme are at the end of this booklet. Attempt the paper in 1½ hours before you look at them.

All questions are original and © Master Testing Agency. Free to download and use for personal practice; not for resale. Master Testing Agency is an independent test-prep publisher, not affiliated with, endorsed by or connected to the Central Board of Secondary Education (CBSE) or any other exam-conducting body.

Chapter: Biodiversity and its Conservation · **Topics:** Levels of biodiversity · Patterns of biodiversity and species-area relationship · Importance of species diversity · Loss of biodiversity and its causes · In situ and ex situ conservation

SECTION A

This section comprises 8 questions of 1 mark each: 6 multiple choice questions (MCQs) and 2 assertion-reason based questions.

1. The term 'biodiversity' was popularised by the sociobiologist 1

(A) Robert May
(B) Paul Ehrlich
(C) Edward Wilson
(D) David Tilman

2. The IUCN Red List (2004) documents the extinction of how many species in the last 500 years? 1

(A) 784
(B) 7000
(C) 78
(D) 7.84 million

3. The most important cause of the loss of plant and animal species is 1

(A) co-extinction
(B) over-exploitation
(C) alien species invasion
(D) habitat loss and fragmentation

4. Bioprospecting means 1

(A) mining for minerals in forest areas
(B) exploring molecular, genetic and species-level diversity for products of economic importance
(C) counting the species in a protected area
(D) moving threatened species to zoos

5. Which of the following is a method of ex situ conservation? 1

(A) Cryopreservation of gametes and storage in seed banks
(B) A national park
(C) A sacred grove
(D) A biosphere reserve

6. For a group of organisms with $Z = 0.2$, if the area explored increases 32 times, the number of species increases about 1

(A) 32 times
(B) 6.4 times
(C) 2 times
(D) 0.2 times

7. **Assertion (A):** Tropical regions have greater biodiversity than temperate regions. 1
Reason (R): The Amazon rain forest is called the 'lungs of the planet'.

(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.

8. **Assertion (A):** The introduction of an alien species always increases the biodiversity of an area. 1
Reason (R): The Nile perch is a large predatory fish.

(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

This section comprises 3 short answer questions of 2 marks each.

9. (a) What is co-extinction? Give one example. 2

OR

(b) Explain over-exploitation as a cause of loss of biodiversity, with two examples.

10. (a) Explain the 'rivet popper hypothesis'. 2

OR

(b) What did David Tilman's long-term ecosystem experiments with outdoor plots show about biodiversity?

11. What are sacred groves? Name two regions of India where they are found. 2

SECTION C

This section comprises 3 short answer questions of 3 marks each.

12. What is meant by the 'Evil Quartet'? Describe its four components briefly. 3

13. Describe the three types of reasons for conserving biodiversity. 3

14. State three consequences of the loss of biodiversity in a region. Give two examples of species that have become extinct in recent times. 3

SECTION D

This section comprises 1 case-based question of 4 marks, with sub-parts of 1, 2 and 1 marks.

15. The Nile perch, a large predatory fish, was introduced into Lake Victoria in East Africa. Within some years, many of the lake's native cichlid fish species disappeared. In India, the African catfish Clarias gariepinus, introduced for aquaculture, is now a threat to the native catfishes of our rivers.

(I) What term is used for species, such as the Nile perch, that are brought into a new area and spread there? [1]

(II) Explain how such species cause the loss of native species. Name two plant species that have become invasive in India. [2]

(III) How many cichlid fish species were lost from Lake Victoria? [1]

OR

(III) Name any one of the other three causes of the 'Evil Quartet', with an example. [1]

SECTION E

This section comprises 2 long answer questions of 5 marks each.

16. (a) (i) Describe the latitudinal gradient in species diversity, with examples, and give three hypotheses that explain why the tropics are so rich in species. 5

(ii) State the species-area relationship and write its equation, explaining Z.

OR

(b) Describe the three levels of biodiversity, giving an example of each from India.

17. (a) Distinguish between in situ and ex situ conservation. Describe biodiversity hotspots, protected areas and sacred groves as in situ methods, and three ex situ methods. Name two international efforts for conserving biodiversity. 5

OR

(b) Describe the estimates of the number of species on earth and in India. What proportion of the recorded species are animals, and which group of animals is the richest in species?

END OF THE QUESTION PAPER

ANSWER KEY — SECTION A

Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8
(C)	(A)	(D)	(B)	(A)	(C)	(B)	(D)

MARKING SCHEME AND WORKED SOLUTIONS

Marks for each step are shown in brackets, as in the CBSE marking scheme. Any correct alternative method earns full marks.

Q1. Answer (C). Edward Wilson popularised the term to describe the combined diversity at all levels of biological organisation.

Q2. Answer (A). 784 species: 338 vertebrates, 359 invertebrates and 87 plants.

Q3. Answer (D). Of the four causes of the 'Evil Quartet', habitat loss and fragmentation is the most important, as in the clearing of tropical rain forests.

Q4. Answer (B). Nations with rich biodiversity can expect large benefits from bioprospecting, for example for new medicines from plants.

Q5. Answer (A). Ex situ: the threatened organisms or their gametes are protected outside their natural habitat.

Q6. Answer (C). $S \propto A^Z$: $32^{0.2} = 2$.

Q7. Answer (B). Both are true (it produces about 20 % of the oxygen in the earth's atmosphere), but this does not explain why the tropics are more diverse. Answer B.

Q8. Answer (D). Invasive alien species can cause the decline or extinction of native species, so A is false; R is true. Answer D.

Q9. (2 marks) Answer: (a) obligatory partners also lost; host fish and its parasites; (b) Steller's sea cow, passenger pigeon.
(a) When a species becomes extinct, the plant and animal species associated with it in an obligatory way also become extinct. [1] E.g. when a host fish species becomes extinct, its unique assemblage of parasites also meets the same fate; or a plant and its coevolved pollinator (as in the fig and its wasp) — the extinction of one leads to the extinction of the other. [1]
OR (b) When 'need' turns to 'greed', natural resources are over-exploited. [1] Steller's sea cow and the passenger pigeon became extinct in the last 500 years through over-exploitation by humans; many marine fish populations are over-harvested. [1]

Q10. (2 marks) Answer: (a) species are rivets; key species on the wings; (b) more species → more stability and productivity.
(a) Paul Ehrlich compared an ecosystem to an aeroplane (the ecosystem), whose rivets (species) join all its parts together. [1] If every passenger pops a rivet to take home (causing a species to become extinct), it may not affect flight safety at first, but as more rivets are removed the plane becomes dangerously weak; loss of rivets on the wings (key species that drive major ecosystem functions) is a more serious threat. [1]
OR (b) Tilman found that plots with more species showed less year-to-year variation in total biomass (greater stability). [1] Increased diversity also contributed to higher productivity. [1]

Q11. (2 marks) Answer: protected forest tracts; Khasi and Jaintia Hills, Aravallis.
Tracts of forest set aside, where all the trees and wildlife are venerated and given total protection, because of cultural and religious traditions. [1] Any two: the Khasi and Jaintia Hills in Meghalaya; the Aravalli Hills of Rajasthan; the Western Ghat regions of Karnataka and Maharashtra; the Sarguja, Chanda and Bastar areas of Madhya Pradesh. [1]

Q12. (3 marks) Answer: habitat loss and fragmentation, over-exploitation, alien invasions, co-extinctions.
The four major causes of the accelerated rate of species extinctions. [½]
Habitat loss and fragmentation: the most important cause, e.g. tropical rain forests once covered more than 14 % of the earth's land surface and now cover no more than 6 %; fragmentation affects animals needing large territories. [1] Over-exploitation: e.g. Steller's sea cow and the passenger pigeon. [½]
Alien species invasions: e.g. the Nile perch in Lake Victoria; Parthenium, Lantana, water hyacinth; the African catfish Clarias gariepinus threatening indigenous catfishes. Co-extinctions: an obligatorily associated species also becomes extinct (a host and its parasites). [1]

Q13. (3 marks) Answer: narrowly utilitarian, broadly utilitarian, ethical.
Narrowly utilitarian: humans derive countless direct economic benefits from nature — food, firewood, fibre, construction material, industrial products and medicines (more than 25 % of the drugs sold in the world are derived from plants; bioprospecting looks for products of economic importance). [1]
Broadly utilitarian: biodiversity plays a major role in many ecosystem services, e.g. the Amazon forest produces about 20 % of the total oxygen of the earth's atmosphere through photosynthesis; pollination by bees, birds and bats; and aesthetic pleasures. [1]
Ethical: every species has an intrinsic value, even if it is not of economic value to us; we have a moral duty to care for their well-being and pass on our biological legacy in good order to future generations. [1]

Q14. (3 marks) Answer: decline in productivity, less resistance, more variability; dodo, quagga.
Any three [2]: a decline in plant production; lowered resistance to environmental perturbations such as drought; increased variability in certain ecosystem processes such as plant productivity, water use, and pest and disease cycles.
Any two [1]: the dodo (Mauritius), the quagga (Africa), the thylacine (Australia), Steller's sea cow (Russia), and three subspecies of tiger (Bali, Javan, Caspian).

Q15. (4 marks) Answer: (I) alien invasive species; (II) no natural enemies; Parthenium, Lantana; (III) >200, or another cause.
(I) Alien (exotic) invasive species. [1]
(II) In the new habitat they have no natural enemies, so they multiply rapidly and compete with or prey on native species, causing their decline or extinction. [1] Any two: Parthenium (carrot grass), Lantana, water hyacinth (Eichhornia). [1]
(III) More than 200 species. [1]
OR (III) Any one: habitat loss and fragmentation (e.g. clearing of tropical rain forests); over-exploitation (e.g. Steller's sea cow); co-extinctions (e.g. a host fish and its parasites). [1]

Q16. (5 marks) Answer: (a) decreasing from equator to poles; three hypotheses; log S = log C + Z log A; (b) genetic (Rauwolfia), species (Western Ghats), ecological (India vs Norway).
(a) (i) Species diversity generally decreases from the equator towards the poles: e.g. Colombia, near the equator, has nearly 1400 species of birds, New York (41° N) has 105 and Greenland (71° N) only 56; India, largely in the tropics, has more than 1200 species of birds; the Amazonian rain forest has the greatest biodiversity on earth. [1] Hypotheses: tropical latitudes have remained relatively undisturbed for millions of years, giving a long time for species diversification; tropical environments are less seasonal and more constant and predictable, which promotes niche specialisation; there is more solar energy available in the tropics, which contributes to higher productivity. [2]
(ii) Alexander von Humboldt observed that within a region species richness increases with the explored area, but only up to a limit. [½] log S = log C + Z log A (S = species richness, A = area, Z = slope, C = Y-intercept). [1] Z is 0.1–0.2 for small areas, and much steeper (0.6–1.2) for very large areas such as whole continents. [½]
OR (b) Genetic diversity: a single species may show high diversity at the genetic level, e.g. the medicinal plant Rauwolfia vomitoria in different Himalayan ranges varies in the potency and concentration of reserpine; India has more than 50,000 genetically different strains of rice and 1000 varieties of mango. [2] Species diversity: diversity at the species level, e.g. the Western Ghats have a greater amphibian species diversity than the Eastern Ghats. [1½] Ecological diversity: at the ecosystem level, India, with deserts, rain forests, mangroves, coral reefs, wetlands, estuaries and alpine meadows, has a greater ecosystem diversity than a Scandinavian country such as Norway. [1½]

Q17. (5 marks) Answer: (a) in situ vs ex situ; hotspots, protected areas, sacred groves; zoos, cryopreservation, seed banks; Rio 1992, Johannesburg 2002; (b) global and Indian estimates.

(a) In situ conservation protects species in their natural habitat; ex situ conservation protects threatened species outside their natural habitat. [½] Biodiversity hotspots are regions with very high levels of species richness and high endemism; there are 34 hotspots, and three of them — the Western Ghats and Sri Lanka, Indo-Burma and the Himalaya — cover India's biodiversity-rich regions; together the hotspots cover less than 2 % of the earth's land area, yet strict protection could reduce the ongoing mass extinctions by almost 30 %. [1½] India's ecologically unique and biodiversity-rich regions are legally protected as biosphere reserves, national parks and wildlife sanctuaries; sacred groves are forest tracts protected by religious and cultural tradition. [1] Ex situ methods (any three): zoological parks, botanical gardens and wildlife safari parks; cryopreservation of gametes of threatened species; in vitro fertilisation and tissue culture; seed banks for commercially important plants. [1] International efforts: the Earth Summit in Rio de Janeiro (1992), which called on all nations to take measures to conserve biodiversity; the World Summit on Sustainable Development in Johannesburg (2002), where 190 countries pledged to reduce the rate of biodiversity loss significantly by 2010. [1]

OR (b) More than 1.5 million species have been recorded (IUCN, 2004); Robert May places the global species diversity at about 7 million. [1] More than 70 % of all recorded species are animals, and only about 22 % plants; among animals, insects are the most species-rich group, making up more than 70 %. [1] India, with only 2.4 % of the world's land area, has 8.1 % of its species diversity and is one of the 12 megadiversity countries. [1] Nearly 45,000 species of plants and twice as many animals have been recorded from India. [1] Applying May's estimate, more than 1,00,000 plant species and 3,00,000 animal species may remain to be discovered and described in India. [1]

All questions are original and © Master Testing Agency. Free to download and use for personal practice; not for resale. The species-area calculations in this paper were checked independently by computer; counts of protected areas, which have changed since the textbook was written, are not asked.