Ref. No.: Ex/PG/EBT/T/116/2024

M. TECH. ENVIRONMENTAL BIOTECHNOLOGY 1ST SEM. EXAM 2024

Subject: BIODIVERSITY CONSERVATION & MANAGEMENT

Time: Three Hours Full Marks: 100

(Use separate answer script for each group)

(50 marks for each part)

Part I

Answer 10 questions carrying five marks each. Answers should be BRIEF and to-the-point

1. Why do you think protected areas need to be managed as a coherent network rather than as isolated habitat islands?

2. What are the three interconnected priorities to address the continued global loss of biodiversity?

3. What are the main pressures driving biodiversity loss?

4. What are the effects of global climate change on species and ecosystems?

5. How will you design new natural areas and restoration sites to maximize resilience?

6. Briefly discuss the approach of translocation of species at risk of extinction.

7. What are the strategies related to monitoring and planning for species conservation.

8. Write briefly about dynamic landscape conservation plans.

9. What are the ecosystem services of biodiversity?

10. Discuss the technique of cryopreservation.

11. Why do species require conservation breeding? How are such species classified?

12. What is the common cause of failure in reintroducing animals?

13. Why is genetic adaptation in captivity not desired?

14. Give two examples of legislation in India as a protection measure for the preservation of biodiversity?

15. Explain the three main reasons for the low protected area habitat quality in India?

16. Mention the role of local champions in the maintenance of biodiversity in India?

[Turn over

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Part II

Question no **1** and **6** is compulsory and attempt any **three** questions from the remaining.

1. Answer all questions. 1X 15=15

i. The travelling of long distances in search of a new habitat is called
(a) Speciation (b) migration (c) succession (d) All of them

ii. A relationship while individuals of the other species do not benefit and are not harmed (+/0) is called
(a) Mutualism (b) commensalism (c) symbiosis (d) allelopathy

iii. This is the evolutionary process by which new biological organism arise and it may also be induced artificially, through animal husbandry or laboratory experiments, is called :
a)Speciation (b) migration (c) succession (d) All of them

iv. The .....diversity is the variation in genes and genotypes within a species
(a) genetic diversity (b) species diversity (c) ecosystem diversity (d) None of them

v. Preparation of Red Data Book, Fauna of India, and Fauna of States have been done by-
(a) WWF (b) WWI (c) ZSI (d) BSI

vi. *Giardia intestinalis* present in human gut are the examples of
(a) Mutualism (b) commensalism (c) parasitism (d) allelopathy

vii. The overall species diversity across communities within a larger geographic area is called
(a) Alpha diversity (b) Beta diversity (c) Gamma diversity (d) all of them

viii. "Tree frog on plants" is the associations between plant and tree frog is called
(a) parasitism (b) commensalism (c) symbiosis (d) allelopathy

ix. Locust insects harm the seed crop. This is the examples of –
(a) parasitism (b) cannibalism (c) symbiosis (d) predation

x. Different species of these birds live on different islands in the Galápagos archipelago, located in the Pacific Ocean off South America. The finches are isolated from one another by the ocean. Over millions of years, each species of finch developed a unique beak that is especially adapted to the kinds of food it eats. Some finches have large, blunt beaks that can crack the hard shells of nuts and seeds. This is the examples of
a)Speciation (b) migration (c) succession (d) All of them

xi. ..... species hold together the complex web of relationships in an ecosystem.
(a) Predator species (b) Rare species (c) Keystone species (d) Endemic species

xii. The ..... pyramid of aquatic ecosystem is inverted.
(a) standing (b) energy (c) number (d) biomass

xiii. apple maggot, an insect that lays its eggs inside the fruit of an apple, causing it to rot. As the apple falls from the tree, the maggots dig in the ground before emerging as flies several months later. The apple maggot originally laid its eggs in the fruit of a relative of the apple—a fruit called a hawthorn. After apples were introduced to North America in the 19th century, a type of maggot developed that only lays its eggs in apples. The original hawthorn species still only lays its eggs in hawthorns. The two types of maggots are not different species yet, but many scientists believe they are undergoing the process of .....

(a) Allopatric speciation, (b)sympatric speciation, (c) both of them (d) Parapatric speciation

xiv. The fossil records show that something unusual happened millions of years ago. A wide range of animals from terrestrial megafauna to tiny aquatic beings died suddenly. This is the examples of :

a) Speciation (b) Mass extinction (c) Chronic extinction (d) extinction

xv. Mining activities leave waste with high amounts of metals like lead and zinc. These metals are absorbed into the soil, preventing most plants from growing. Some grasses, such as buffalo grass, can tolerate the metals. Buffalo grass has become a unique species from the grasses that grow in areas not polluted by metals. This phenomenon is known as:

(a) Allopatric speciation, (b)sympatric speciation, (c) both of them (d) Parapatric speciation

2. What do you understand by ecosystem dynamicity? Explain with a flow diagram. How is biodiversity important for ecosystem functioning? 1+ 5+4

3. Discuss ecosystem energetics citing suitable examples of a pond ecosystem. Suppose 118,872 Cal/sq cm/yr solar radiation has been received by the pond. Distinguish between natural ecosystem and manmade ecosystem. 6 + 4

4. Write briefly about five types of speciation. Briefly describe the structural and functional aspect of biosphere reserve, sanctuary and national park in India. 5+5

5. What do you understand by primary productivity of an eco-system? Briefly describe about Primary productivity? Why in an aquatic ecosystem phytoplanktons are considered the best producer? 3+4+3

6. Write short note (any two): 2 X 2.5

(a) Endemic species

(b) Livelihood and biodiversity

(c) Tropical rain forest and biodiversity richness

(d) Difference between parasitism and predation

(e) Ecosystem resilience.