

18/8/22

**M.Sc. (BIOTECHNOLOGY) SEMESTER II
EXAMINATION AUGUST 2022
PAPER CODE – MBT-CC204**

**PAPER TITLE: BIOTECHNOLOGY: ENVIRONMENTAL &
ETHICAL ASPECTS**

Time: Three Hours

Maximum Marks: 75

Attempt all questions. All parts of a question must be attempted in continuation. Start answer of a fresh question on a new page. Cite examples and draw labelled diagrams wherever necessary.

Question No. 1.

Attempt all of the following questions.

PART A

Choose the correct option

[1 x 5 = 5]

- I. **The natural place of an organism or community is known as**
 - a. Niche
 - b. Biome
 - c. Habitat
 - d. Habit
- II. **Which statement is correct with respect to the food chain?**
 - a. Every component of the food chain forms a trophic level
 - b. Inter-relation between different food chains is known as a food web.
 - c. All the chains formed by nutritional relations is used to understand energy flow.
 - d. All of the above
- III. **“The pyramid of energy is always upright” states that**
 - a. The energy conversion efficiency of herbivores is better than carnivores
 - b. The energy conversion efficiency of carnivores is better than herbivores
 - c. Producers have the lowest energy conversion efficiency
 - d. Energy conversion efficiency is the same in all trophic levels

IV. The two important components of research responsibility are: **sincerity in work and avoiding _____.**

- a. Plagiarism
- b. Writing the thesis
- c. Research techniques
- d. Confidentiality

V. In the capacity of a researcher, how can you solve the problems that exist in the society?

- a. Eradicate unethical people from the society.
- b. Request the research institute to form a body of members for solving the problems.
- c. Participate in the activities of a suitable NGO to help in fighting the problems.
- d. None of the above.

PART B

[1 X 5 = 5]

Expand the following.

- a) PCT
- b) IPR
- c) GEAC
- d) WIPO
- e) UPOV

PART C

State whether the following statements are TRUE OR FALSE.

[1 X 5 = 5]

- a) Azolla has symbiotic relationship with Cyanobacterium (*Anabaena azollae*) for nitrogen fixation.
- b) The enzyme complex used by the nitrogen fixing bacteria is nitrogenase.
- c) Lichens are very good examples to monitor the health of the environment.
- d) An invention contrary to laws of public health and morality, for example, toxic drugs, food items, drinks cannot be patented.
- e) This process of determining the nature and magnitude of risk is known as "risk analysis".

Question No. 2.

Attempt any **three** of the following:

[5 x 3 = 15]

- a) Why is the significance of IPR?
- b) What are the different levels of biosafety? Give one example each.
- c) Differentiate between patent and trade mark. Cite examples
- d) Differentiate between a primary and secondary barrier. What is a GLP?
- e) What do you understand by a geographical indicator? Cite example

Question No. 3

Attempt any **two** questions from the following **[7.5 x 2 = 15]**

- Discuss in detail the role of phosphate solubilizing symbiotic association.
- Explain the process of infection by rhizobium in the leguminous plants.
- What are the different types of a bioindicator? Explain the role of microbes and plants as a bioindicator.
- Discuss about the different classes of pesticides. How pesticides are involved in different diseases?

Question No. 4.

Attempt any **three one** of the following. **[5 x 3=15]**

- Explain the three ecological pyramids. What data is propagated by each pyramid in association with function, structure and energy in the ecosystem?
- Explain the biogeochemical cycle. With a reservoir situated in earth's crust, give an example of a sedimentary cycle.
- What is biomagnification and what are its causes?
- Give a brief account of the following:
 - Carrying capacity
 - Survivorship curves
 - Mark capture technique
- Briefly explain about identification of a research problem.

Question No 5

Attempt any **three** questions from the following **[5 x 3 = 15]**

- What is the importance of a gene bank?
- Explain the significance of biofuels in the society? Differentiate between first and third generation biofuels.
- What are the different types of bioremediations?
- Give a detailed account of the Phytoremediation and its uses.
- Write a short note on Green audit and Energy audit.