

B.Sc. Semester - 4 (CBCS) Examination
March/April-2026 [NEW COURSE]
BioTechnology-BT401(Core)

Time: 2:30 Hours**Marks: 70****Instructions:**

1. All questions are compulsory.
2. Figures to the right indicate marks.

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- Que.1(A) Answer the following. (Any one Out of Two) (07)
1. Outline the main processes of the carbon cycle and human impact.
 2. Describe different population interactions with examples.
- Que.1(B) Attempt any one. (Out of Two) (04)
1. Briefly describe the key characteristics of a grassland biome.
 2. Explain the importance of biodiversity conservation.
- Que.1(C) Attempt any three. (Out of Five) (03)
1. Name one example of a freshwater ecosystem.
 2. Biodiversity hotspots are regions with high species richness and a high degree of endemism. (True/False)
 3. In a predator-prey relationship, the prey population typically increases after the predator population increases. (True/False)
 4. The biome characterized by low temperatures, short growing seasons, and permafrost is the _____.
 5. The process by which atmospheric nitrogen is converted into forms usable by plants is called _____.
- Que.2(A) Answer the following. (Any one Out of two) (07)
1. Discuss bacterial hydrocarbon biodegradation.
 2. Explain the biodegradation of DDT and nitrobenzene, highlighting challenges.
- Que.2(B) Attempt any one. (Out of two) (04)
1. Briefly describe bacterial metabolic diversity.
 2. Explain the concept of bioremediation.
- Que.2(C) Attempt any three. (Out of Five) (03)
1. Name one conventional air pollutant.
 2. Aerobic hydrocarbon biodegradation needs oxygen. (True/False)
 3. Acid rain is mainly from carbon dioxide. (True/False)
 4. Bacteria using hydrocarbons for energy are involved in _____.
 5. Pollutant accumulation in higher trophic levels is _____.
- Que.3(A) Answer the following. (Any one Out of two) (07)
1. Discuss important physical, chemical, and biological wastewater properties.
 2. Explain biofertilizers and biocontrol agents with examples.
- Que.3(B) Attempt any one. (Out of two) (04)
1. Briefly differentiate primary and secondary wastewater treatment.
 2. Explain bioleaching and its application.
- Que.3(C) Attempt any three. (Out of Five) (03)
1. What is the main function of biocontrol agents?
 2. Pure water pH is 7 at all temperatures. (True/False)
 3. Composting is an aerobic waste treatment. (True/False)
 4. Removing large solids from wastewater is _____ treatment.
 5. Microbes fixing atmospheric nitrogen are _____.

- Que.4(A) Answer the following. (Any one Out of two) (07)
1. Explain mean, median, and mode, with their uses and drawbacks.
 2. Describe range, variance, SD, and CV, with their applications and limitations in data spread.
- Que.4(B) Attempt any one. (Out of two) (04)
1. Briefly explain sample vs. population.
 2. Why is clear data presentation important?
- Que.4(C) Attempt any three. (Out of Five) (03)
1. What is a frequency distribution?
 2. The mean is always best for skewed data. (True/False)
 3. Standard deviation measures data spread around the mean. (True/False)
 4. The entire group of interest is the _____.
 5. The most frequent value in a dataset is the _____.
- Que.5(A) Answer the following. (Any one Out of two) (07)
1. Explain probability and conditional probability with an example.
 2. Discuss the uses of Student's t-test, Chi-square test, and ANOVA in biology.
- Que.5(B) Attempt any one. (Out of two) (04)
1. Briefly explain correlation vs. regression analysis.
 2. Describe key properties of a normal distribution.
- Que.5(C) Attempt any three. (Out of Five) (03)
1. What is the purpose of correlation analysis?
 2. In linear regression, the dependent variable is predicted. (True/False)
 3. Binomial distribution models trials with more than two outcomes. (True/False)
 4. Strength and direction of linear relationship is measured by _____.
 5. Probability of an event given another has happened is _____.
