

Practice Exam Question ENV-412

Psychrophilic and psychrotolerant microorganisms differ in their growth temperature ranges and ecological distribution.

1) *Briefly define psychrophiles and psychrotolerant microorganisms, highlighting the difference in their optimal growth temperatures.*

3) *Describe the environments where psychrophiles are typically found, and where psychrotolerant microorganisms are more commonly located.*

4) *Give an example of a habitat where psychrotolerant microorganisms can grow and explain why they thrive there.*

5) *Which of the following best defines the concepts of species richness and species abundance in microbial ecosystems?*

A) **Species richness** refers to the proportion of each species in an ecosystem, while **species abundance** refers to the total number of different species present.

B) **Species richness** refers to the total number of different species present, while **species abundance** refers to the proportion of each species in an ecosystem.

C) **Species richness** refers to the evenness of species distribution, while **species abundance** refers to the relative number of individuals in each species.

D) **Species richness** refers to the number of individuals in each species, while **species abundance** refers to the diversity of species within an ecosystem.

6) *List two primary objectives of the spread plate technique.*

7) *Which of the following statements best describes the roles of photosynthesis, respiration, and methane production in the carbon cycle?*

A) **Photosynthesis** reduces CO₂ to organic carbohydrates, while **respiration** converts organic carbohydrates to CO₂, and **methane** is produced by methanogens in anoxic

conditions.

B) **Photosynthesis** reduces CO₂ to organic carbohydrates, while **respiration** produces **methane** and CO₂, and methanotrophs convert **methane** to CO₂.

C) **Photosynthesis** reduces CO₂ to **methane**, while **respiration** converts **methane** back into organic carbohydrates.

D) **Photosynthesis** and **respiration** both reduce CO₂, while **methane** is produced by methanotrophs and converted into organic carbohydrates.