

(A-29)

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SARDAR PATEL UNIVERSITY
M. Sc. IGBT EXAMINATION, SEVENTH SEMESTER
PS07CIGEB3-ENVIRONMENTAL MICROBIOLOGY
13th April, 2016(Wednesday), 2.30 pm to 5.30 pm

Maximum Marks: 70

Note: (1) All the Questions are compulsory. (2) Figures on the right indicate marks.

Q.1 Select the right answer for the following:

1x8
= 8

1. In a lake, epilimnion layer contains _____ group bacteria in maximum number.
a. Heterotrophs b. Chemotrophs c. Cyanobacteria d. Sulphate reducers
2. In complex biofilm community, bacterial populations excrete _____ to form matrix of biofilm where bacterial populations adhere.
a. Proteins b. Polysaccharides c. Enzymes d. Lipids
3. Population Selection r & K strategies is derived from following equation
a. $dx/dt.1/x = r-(r/K *x)$ b. $dx/dt = r-(r/K.x)$
c. $dx/dt.1/x = r-(r/K)$ d. $dt/dx.1/x = r-(r/K.x)$
4. Freshwater runoff and ground water seepage interfaces with marine water is referred as
a. Wetland b. Estuary c. Salt-marsh Estuary d. None
5. Which group of Actinomycetes show N₂ fixation with non leguminous plants
a. Streptomyces b. Mycorrhizae c. Frankia d. Aspergillus
6. Leaf cutting Atta species of ant cultivates _____ group of fungi.
a. Basidiomycetes b. Zygomycetes
c. Deuteriomycetes d. none of these
7. The term _____ is applied to the interaction of two or more populations that supply each other's nutritional needs but it is not an obligatory.
a. Mutualism b. Syntrophism c. Commensalism d. Parasitism
8. FAME analysis is a method to study
a. Species Diversity b. Ecology c. Community Diversity d. None

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(P.T.O.)

- Q.2. Attempt any seven of the following 2x7
=14
1. Explain the r and K strategies of population selection.
 2. Define Humus. How it is formed?
 3. Give 4 names of asymbiotic N₂ fixers.
 4. Enlist strategies for survival of alkalophiles.
 5. Define three reasons for 16 s r DNA as chronological tool.
 6. Define Bacteroids & explain the role of legheamoglobin.
 7. Explain the mechanism of nematode trapping fungi.
 8. Define the role of chemolithotrophs in deep sea thermal vent habitats.
 9. Define cometabolism. How can cometabolism serve as a basis for commensalism?
- Q.3 a. Discuss the composition and activity of marine water microbial community. 6
 b. The atmosphere is a habitat & medium for microbial dispersal: Justify. 6
- OR**
- b. Write a note on species diversity indices 6
- Q.4 a. Define extreme thermophiles. Discuss the physiology & strategies of these thermophiles to survive at extreme high temperature. 6
 b. Explain the method, application & limitation of DGGE as tool to study microbial diversity. 6
- OR**
- b. Discuss different conventional methods to study microbial biodiversity. 6
- Q.5 a. Discuss the mechanism of nodulation process in symbiotic nitrogen fixation 6
 b. Explain the regulatory mechanism of Nitrogenase enzyme. 6
- OR**
- b. Discuss various factors influencing N₂ fixation process. 6
- Q.6 a. Enlist various positive associations among microbes & discuss mutualistic relationship of ant population with fungi. 6
 b. How do microorganisms contribute to the nutrition of ruminant animals? 6
- OR**
- b. Explain the difference b/w predation & parasitism. Discuss parasitism in detail with suitable example. 6

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 (2)