RAMAKRISHNA MISSION VIDYAMANDIRA

(Residential Autonomous College affiliated to University of Calcutta)

B.A./B.Sc. FOURTH SEMESTER EXAMINATION, AUGUST 2021

SECOND YEAR (BATCH 2019-22)

Date : 09/08/2021 **MICROBIOLOGY (Honours)**

Time : 11.00 am – 1.00 pm **Paper : IX [CC 9]** Full Marks : 50

Answer **any five** questions : [5×10]

1. a) How do sulphate and nitrate utilizers in soil use these two in the production of necessary energy?

   b) "Mineralization of organic carbon compounds in acquous habitat results in different end products on the basis of their location" . Write down the mechanism.

   c) Why are bio-fertilizers called microbial inoculants?

   d) Write down the similarities between the nitrogen and sulphur cycles. [3+3+2+2]

2. a) What is microbiovory? What is geosmin?

   b) *Sphingomonas sp* which easily can pass through a 0.2 μm membrane filter. Can you explain the cause of this tiny size for their effective growth?

   c) State the significance of soil organic matter to maintain the soil structure.

   d) Mention the specific mechanism that can be utilized by the aerobic organisms to eliminate the reactive oxygen species?

   e) Why is it observed that the rhizospheric soil is more diversified than that of rest of the soil?

   [(1+1)+2+2+2+2]

3. a) What is cardinal temperature?

   b) Mention the specific adaptation of halophilic marine bacteria.

   c) Describe the rumen ecosystem briefly.

   d) State some advantages of biofilm in the context of bacteria.

   e) What is the difference between species richness and species abundance? [1+2+3+2+2]

4. a) What are 'coliforms'? Explain with examples.

   b) Why is not the routine bacteriological examination of water directed toward isolation and identification of specific pathogens?

   c) Where are septic tanks used? Describe the microbiological activities that take place in a septic tank.

   d) What is activated sludge? Compare the microbial activity in the activated sludge process with that which occurs in a septic tank. [2+2+3+(1+2)]

5. a) Is fermentation of lactose with production of acid and gas positive evidence for the presence of *E. coli*? Explain.

   b) Describe how selective and differential media facilitate the bacteriological analysis of water sample.

   c) What is 'composting'? Discuss the benefits and drawbacks of using compost.

   d) What is 'bioremediation'? [2+3+(1+2)+2]

6. Write down differences of the following terms [2×5]

   a) Causal organism and causal complex?

   b) Biotroph and necrotroph

   c) Sign and symptom

   d) Primary inoculum and secondary inoculum

   e) Pandemic and epidemic

7. a) Make a list of different inoculum for plant diseases.

   b) Write down the different modes of penetration of fungal pathogens.

   c) Pisatin is a phytoalexin –explain.

   d) Write and explain outcome of the following gene interactions [2+2+2+4]

	Corresponding pathogenic gene	
Host gene	A (avirulent)	a (virulent)
R (resistant)		
r (susceptible)		

8. a) Name any two pant pathogenic enzymes and their mode of action.

   b) How does T toxin cause disease?

   c) How can plantibodies be produced?

   d) How do plant pathogens perennate adverse environmental conditions? [4+2+2+2]

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