WEST BENGAL STATE UNIVERSITY

B.Sc. Programme 6th Semester Examination, 2021

MCBGDSE03T-MICROBIOLOGY (DSE2)

MICROBES IN SUSTAINABLE AGRICULTURE AND DEVELOPMENT

Time Allotted: 2 Hours | Full Marks: 40

The figures in the margin indicate full marks.
Candidates should answer in their own words and adhere to the word limit as practicable.

Answer Question No. 1 and any *four* questions from the rest

1. Answer any ***four*** questions from the following: 2×4 = 8
   (a) What is Geosmin?
   (b) Write the name of two greenhouse gases that emitted from soil.
   (c) What are epiphytic bacteria?
   (d) What is bioremediation?
   (e) What are GM crops? Give two examples.
   (f) Write the effects of PGPR.
   (g) What is bacteroid?
   (h) Give examples of one bacteria and one fungi that are used as insecticides.

2. (a) How does soil serve as a habitat for microorganisms? 3
   (b) How does *Bacillus thuringiensis* (Bt) associated with GMO corn? 3
   (c) What is leghemoglobin? 2

3. (a) Define Biomagnification. 2
   (b) How are insect viruses used in the control of plant diseases? 3
   (c) How is vermicompost prepared? 3

4. (a) "Soil gases has a ratio of high CO_2 and low O_2" — Explain. 2
   (b) What elements are dependent on biogeochemical cycle? 1
   (c) How to control the emission of CO_2 and methane gases? 2+2
   (d) Write the name of soil bacteria that produce nitric oxide. 1

5. (a) What are transgenic animals? How do they beneficial to humans? 1+3
   (b) How does plant growth promoting bacteria provide multiple benefits in agriculture? 2
   (c) Which type of microorganisms are commonly used in biogas production? 2

6. (a) What are xenobiotics? 2

   (b) Briefly describe the role of *Dehalococcoides* in biodegradation. 3

   (c) Explain the importance of *Botryococcus braunii*. 3

7. (a) What is biogas? Briefly describe the biogas production process. 1+2

   (b) What are the four different groups of microbes involved in methane production? 2

   (c) What is ICPs? Write role of ICPs in agriculture. 1+2

8. (a) Write the selection procedure of rhizobial inoculant. 2

   (b) Write the role of different groups of N_2 fixing bacteria as plant growth promoter. 2

   (c) Give an example on bio-fuel with its production procedure. 1+3

N.B. : *Students have to complete submission of their Answer Scripts through E-mail / Whatsapp to their own respective colleges on the same day / date of examination within 1 hour after end of exam. University / College authorities will not be held responsible for wrong submission (at in proper address). Students are strongly advised not to submit multiple copies of the same answer script.*

——×——