

PARUL UNIVERSITY
FACULTY OF APPLIED SCIENCE
M.Sc., Summer 2022-23 Examination

Semester: 4**Subject Code: 11201230****Subject Name: Agricultural and environmental Microbiology****Date: 20-03-2023****Time: 2:00pm to 4:30pm****Total Marks: 60****Instructions:**

1. All questions are compulsory.
2. Figures to the right indicate full marks.
3. Make suitable assumptions wherever necessary.
4. Start new question on new page.

- Q.1. A) Essay type/ Brief note (08) (08)**
(a) Describe Biological nitrogen fixation in detail.
- Q.1. B) Answer the following questions (Any two) (04)**
(a) Short note/ Brief note (2x2)/ Schematically label the figures (2x2) (Each of 02 marks) (04)
1. Draw a labeled diagram of packed bed reactor
2. Define bioleaching
(b) Short note on biosorption (04)
(c) Short note on bioaccumulation (04)
- Q.2. A) Answer the following questions. (04)**
(a) Short note/ Brief note (2x2)/ Fill in the blanks. (Each of 02 marks) (04)
1. Bioaugmentation is a process that involves _____
2. _____ bioremediation approach involves use of plants to degrade pollutants
(b) Short note on PGPR (04)
- Q.2. B) Answer the following questions (Any two) (03)**
(a) Short note/ Multiple choice questions. (Each of 01 marks) (03)
1. Define Biofertilizers with an example.
2. Short note on endomycorrhizae
3. Briefly describe ozone depletion
(b) Short note on phosphate solubilization (03)
(c) Short note on factors affecting rhizosphere colonization (03)
- Q.3. A) Essay type/ Brief note (4x2) (Each of 04 marks) (08)**
(a) Describe the signaling factors and molecular interaction in establishing Rhizobia legume symbiosis.
- Q.3. B) Answer the following questions (Any two) (04)**
(a) Short note/ Brief note (2x2)/ Schematically label the figures (2x2) (Each of 02 marks) (04)
1. Brief note on global warming
2. Brief note on trickling filters
(b) Short note on nitrogenase enzyme (04)
(c) Short note on pollution and its classification (04)
- Q.4. A) Answer the following questions. (04)**
(a) Short note/ Brief note (2x2)/ Fill in the blanks. (Each of 02 marks) (04)
1. Define detoxification
2. Brief note on biodegradation
(b) Short note on environmental laws and its policies (04)
- Q.4. B) Answer the following questions (Any two) (03)**
(a) Short note/ Multiple choice questions. (Each of 01 marks) (03)
1. Define activated sludge process
2. What is acid rain
3. Short note on fluidised bed reactor
(b) Short note on use of GMO's in bioremediation with example (03)
(c) Short note on composting (03)