

**PARUL UNIVERSITY**  
**FACULTY OF APPLIED SCIENCE**  
**M.Sc., Summer 2018-19 Examination**

**Semester: 4****Subject Code: 11201251****Subject Name: Agricultural and Environmental Microbiology****Date: 01/04/2019****Time: 02:00 pm to 04:30 pm****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 (4x2) (Each of 04 marks) (08)**  
 (a) Biochemistry of nitrogen fixation  
 (b) Molecular interaction in establishing Rhizobia- legume symbiosis
- 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. Regulation of nif gene expression  
 (b) Activated sludge process (04)  
 (c) Anaerobic reactors (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. Phosphate solubilizing bacteria  
 (b) Phosphate solubilizing fungi (04)
- Q.2. B) Answer the following questions (Any two) (03)**  
 (a) Short note/ Multiple choice questions. (Each of 01 marks) (03)  
 1. Ecto-mycorrhizae  
 (b) Write down the advantages of mycorrhizae. (03)  
 (c) Trickling filters (03)
- Q.3. A) Essay type/ Brief note (4x2) (Each of 04 marks) (08)**  
 (a) Plant growth promoting rhizobacteria(PGPR)  
 (b) Factors affecting colonization of rhizosphere by soil microorganisms
- 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. Explain the mechanism of plant growth promotion by PGPR  
 (b) Write brief note on: Bioremediation (04)  
 (c) Briefly describe the role of GMO'S in bioremediation and biodegradation (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. Global warming  
 (b) Ozone depletion (04)
- Q.4. B) Answer the following questions (Any two) (03)**  
 (a) Short note/ Multiple choice questions. (Each of 01 marks) (03)  
 1. Describe characteristics of municipal waste water  
 (b) Differentiate between aerobic and anaerobic digestion in waste water treatment. (03)  
 (c) Write brief note on: Bioremediation of Hydrocarbons citing specific examples (03)