

**PARUL UNIVERSITY**  
**COLLEGE OF AGRICULTURE**

**B.Sc.(Hons.) Agriculture, Winter 2017 - 18 Examination**

Semester: 2

Date: 01/01/2018

Subject Code: 20110151

Time: 10:30 am to 1:00 pm

Subject Name: Agricultural Microbiology

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 Do as Directed.****A. Fill in the blanks. (Each of 0.50 marks)****(10)**

1. A text book of Soil Microbiology is written by \_\_\_\_\_.
2. First microscope was invented by \_\_\_\_\_.
3. \_\_\_\_\_ investigated pebrine disease of silkworm.
4. \_\_\_\_\_ first proposed use of agar in culture media.
5. \_\_\_\_\_ developed Petri dish used for solid culture media.
6. Melting point of agar is \_\_\_\_\_ °C.
7. Melting point of gelatine is \_\_\_\_\_ °C.
8. \_\_\_\_\_ discovered Penicillin from fungus *Penicillium notatum*.
9. \_\_\_\_\_ received Nobel Prize for the discovery of penicillin.
10. \_\_\_\_\_ discovered Polymerase Chain Reaction to amplify DNA *in vitro*.
11. \_\_\_\_\_ discovered Prions.
12. \_\_\_\_\_ is known as father of microbiology.
13. \_\_\_\_\_ established the "Division of Microbiology" at IARI, New Delhi.
14. \_\_\_\_\_ initiated research on *Rhizobium* bioinoculant and Nuclear polyhedrosis virus (NPV) for the first time in India at GAU, Anand Campus, Anand.
15. Meaning of word "Mycorrhiza" \_\_\_\_\_.
16. \_\_\_\_\_ isolated the agents of symbiotic (1888) and non-symbiotic aerobic (1901) nitrogen fixation.
17. \_\_\_\_\_ is known as intermediate group between bacteria and fungi.
18. Biological nitrogen fixation is a \_\_\_\_\_ process.
19. *Azotobacter* is a type of \_\_\_\_\_ nitrogen fixer.
20. A cyanobacterium is a type of \_\_\_\_\_ nitrogen fixer.

**B. Multiple choice type questions. (Each of 0.50 mark)****(10)**

1. *Clostridium* is a type of \_\_\_\_\_ nitrogen fixer.
 

a) Comma shape	c) G. negative
b) Free living	d) G. positive
2. An example of aerobic free living nitrogen fixer is \_\_\_\_\_.
 

a) <i>Rhizobium</i>	c) <i>Azotobacter</i>
b) PSB	d) Non of above
3. An example of anaerobic free living nitrogen fixer is \_\_\_\_\_.
 

a) <i>Vibrio</i>	c) <i>Bacillus</i>
b) <i>Clostridium</i>	d) <i>Pseudomonas</i>
4. *Azospirillum* is a type of \_\_\_\_\_ nitrogen fixer.
 

a) Associative symbiotic	c) N fixer
b) P fixer	d) Non of above
5. An example of associative symbiotic nitrogen fixer is \_\_\_\_\_.
 

a) <i>Azospirillum</i>	c) Phosphate
b) Potash	d) Non of above
6. *Rhizobium* is a type of \_\_\_\_\_ nitrogen fixer.
 

a) non- symbiotic	c) Symbiotic
b) Free living	d) Associated
7. *Bradyrhizobium* is a type of \_\_\_\_\_ nitrogen fixer.



**Q.2 Do as Directed.**

**A. Match group A with group B. (Each of 0.50 marks)**

**(05)**

**A**

- 1) Agar
- 2) *Azospirillum*
- 3) *P. fluorescence*
- 4) Benzoic acid
- 5) *B. bassiana*
- 6) Sonali Pandey
- 7) Watson & Crick
- 8) Leeuwenhoek
- 9) Kary Mullis
- 10) *Rhizobium*

**B**

- a) Double helix structure of DNA
- b) *Fusarium* spp.
- c) Symbiotic N<sub>2</sub> fixer
- d) 1<sup>st</sup> microscope invented
- e) PCR
- f) Solidifying agent
- g) Text book of microbiology
- h) Muscadine disease
- i) Chemical preservative
- j) Associative N<sub>2</sub> fixer

**B. Define the following. (Any ten)**

**(05)**

1. Microbiology
2. Pasteurization
3. Fungi
4. Bacteria
5. Antibody
6. Antibiotics
7. Antitoxin
8. Blanching
9. Biopesticides
10. Immunity
11. Food spoilage
12. Virulent microbes

**C. Answer the following. (Any ten)**

**(10)**

1. Explain mechanism of bt cotton on bollworms.
2. Explain method of preparation and application of NPV.
3. Give methods of food preservation.
4. Give factors influencing activities of soil microorganisms.
5. Give advantages of biopesticides.
6. Enlist symbiotic nitrogen fixers.
7. Define: Soil microbiology.
8. Give factors affecting root nodulation.
9. Enlist important impacts of microbes on ecosystem.
10. Give importance of microorganisms in soil.
11. Give types of nitrogen fixing bacteria with examples.
12. Enlist stages of root nodulation process.

**Q.3 Write short notes. (Any five)**

**(10)**

1. Explain: Biopesticides.
2. Explain: Food spoilage.
3. Explain stages of root nodulation process.
4. Explain: Food preservation.
5. Enlist factors influencing activities of soil microorganisms.
6. Explain: Reddi's experiment on spontaneous generation theory.

**Q.4 Differentiate the following. (Any five)**

1. Prokaryotes vs Eukaryotes
2. Free living nitrogen fixers vs Symbiotic nitrogen fixers
3. Food spoilage by microbes vs Food spoilage by insects
4. Tyndallisation vs Pasteurization
5. Boiling vs Blanching
6. Free living nitrogen fixers vs Associative nitrogen fixers
7. Gram positive bacteria vs Gram negative bacteria