

PSG COLLEGE OF ARTS & SCIENCE  
(AUTONOMOUS)  
BSc DEGREE EXAMINATION MAY 2024  
(Fourth Semester)

Branch - MICROBIOLOGY

SOIL AND AGRICULTURAL MICROBIOLOGY

Time: Three Hours

Maximum: 50 Marks

SECTION-A (5 Marks)

Answer ALL questions

ALL questions carry EQUAL marks

(5 x 1 = 5)

1. Who is called the father of soil microbiology \_\_\_\_\_?  
(a) Beijernick (b) Winogradsky  
(c) Hiltner (d) Alexander flaming
2. Which of the following comes under the category of positive association?  
(a) Antagonism (b) Mutualism  
(c) Parasitism (d) Commensalism
3. Which of the following processes is performed by *Thiobacillus thiooxidans*?  
(a) Converting organic sulphur to inorganic sulphur  
(b) Converting sulphur to sulphates  
(c) Converting sulphur to sulphides  
(d) Converting sulphur to sulphites
4. Biological nitrogen fixation is the conversion of  
(a) Conversion of  $N_2$  to  $NO_3^-$  and  $NH_3$  (b) Conversion of  $N_2$  to N  
(c) Conversion of  $N_2$  to Urea (d) Conversion of  $N_2$  to  $NH_3$
5. What are bio-insecticides?  
a) Insects b) Living organisms that kill specific insects  
c) Insects that kill other big insects d) Fungi

SECTION - B (35 Marks)

Answer ALL Questions

ALL Questions Carry EQUAL Marks (5 x 3 = 15)

- 11 a What is Autochthonous? Enlighten the importance and distributions in soil.  
OR  
b List out the environmental factors influence the growth of microorganism.
- 12 a Short note on –Predation and Parasitism with suitable examples.  
OR  
b Relate the microbial association with suitable examples.
- 13 a Encounter the mineral transformation in ecological interrelationships of microbes.  
OR  
b Discuss the Phosphorus biogeochemical cycle with neat sketch.
- 14 a Express the relation of nif gene in nodulation process.  
OR  
b Define Biofertilizer. Explain the merits and demerits of biofertilizer .

Cont...

- 15 a State the role of nematodes as an insecticide and explain with application.  
OR  
b Summarize the role of fungal insecticide and its mass production with neat protocol.

**SECTION - C (30 Marks)**

Answer any **THREE** Questions

**ALL** Questions Carry **EQUAL** Marks (5 x 6 = 30)

- 16 a. Categorize the role of microorganisms in enhancement of soil fertility.  
(OR)  
b. Highlight distribution and significant role of zymogenous microflora in soil.
- 17 a. Encounter the interaction of microbial populations with suitable examples.  
(OR)  
b. Point out the negative microbial interactions with suitable examples.
- 18 a. Elaborate the carbon cycle and explain the role of microorganism.  
(OR)  
b. Elaborate the Sulphur cycle and explain the role of microorganism.
- 19 a. Discuss the mechanism of symbiotic and non - symbiotic nitrogen fixation.  
(OR)  
b. Explain the role of *Rhizobium* sp as a biofertilizer. Write the mass production with neat protocol.
- 20 a. Distinguish the bacterial and fungal bio - pesticides and crop application process in detail  
(OR)  
b. Highlight the microbial insecticide and discuss the merits and demerits in detail.

Z-Z-Z END