

PSG COLLEGE OF ARTS & SCIENCE

(AUTONOMOUS)

BSc DEGREE EXAMINATION DECEMBER 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 What are all of the microorganisms that live in a particular environment called?

- (a) Autochthonous (b) Allochthonous (c) Microbiome (d) Autogenous

2 The degradation of complex molecules in soil by fungi for utilization by bacteria is an example of which type of association?

- (a) Neutralism (b) Mutualism (c) Commensalism (d) Antagonism

3 What is the process of release of inorganic substances both minerals and non-minerals from organic matter called?

- (a) Mineralization (b) Fragmentation (c) Leaching (d) Humification

4 The transformation of nitrates to gaseous nitrogen is accomplished by microorganisms in a series of biochemical reactions. The process is known as

- (a) Nitrification (b) Denitrification (c) Ammonification (d) Nitrogen fixation

5 *Trichoderma harzianum* is used for

- (a) wasteland reclamation (b) bioremediation of contaminated soil
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- (c) gene transfer (d) Biocontrol agent against plant pathogens

SECTION - B (15 Marks)

Answer ALL Questions

ALL Questions Carry EQUAL Marks

(5 x 3 = 15)

11 a Extend the significant role of micro flora in soil.

OR

b Summarize the distribution and abundance of Fungi in soil.

12 a Comment on Neutralism and Competition with suitable examples.

OR

b Discuss the importance of positive and negative microbial interactions.

13 a Short note on Sulphur cycle with neat diagram.

OR

b How microorganisms associate with organic matter in decomposition process.

14 a Narrate the mechanism involved in non-symbiotic nitrogen fixation with examples.

OR

b How blue green algae act as a biofertilizer? Explain in detail.

Cont....

- 15 a Give a short note on Bacterial insecticide with its application.

OR

- b What is Biopesticide? Relate how the microbes take part in the symbiotic association with insects.

SECTION - C (30 Marks)

Answer any **THREE** Questions

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

- 16 a. Justify the environmental factors influence the microbial community in soil.

(OR)

- b. Elaborate the impact of microbial distribution and abundance in soil.

- 17 a. Comment on mutualistic relationship between microorganisms with suitable examples.

(OR)

- b. Discuss the microbial interactions with examples - (i) Ammensalism (ii) Commensalism

- 18 a. Encounter Nitrogen cycle and explain the role of microorganism in nitrogen fixation.

(OR)

- b. Clarify the beneficial association of microbes in biogeochemical cycles.

- 19 a. Classify Mycorrhiza and elaborate the benefits of VAM fungi with suitable examples.

(OR)

- b. Define nodulation. Elaborate the importance of nif and nod gene in nodulation process.

- 20 a. Describe in detail about virus and nematode insecticide draw the protocol of mass production.

(OR)

- b. Justify the microbial association with insect. Explain its role of microbial insecticide with suitable example.

Z-Z-Z

END