

Name:

Enrolment No:



UNIVERSITY OF PETROLEUM AND ENERGY STUDIES

End Semester Examination, December 2022

Course: Environmental Microbiology and Microbial Ecology

Program: B.Sc. Microbiology

Course Code: HSMB2009


Semester: III

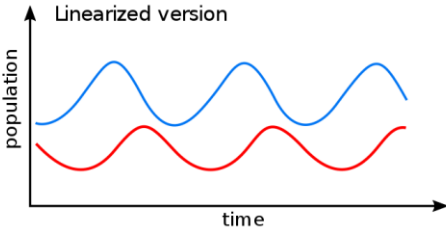
Duration: 03 hrs.

Max. Marks: 100

Instructions:

S. No.	Section A Short answer questions/ MCQ/T&F (20Qx1.5M= 30 Marks)	Marks	COs
1	Which microbes occupy bottom of Winogradsky column?	1.5	CO2
2	Phosphate solubilizing bacteria secreteand fungi secrete	1.5	CO1
3	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	1.5	CO1
4	Which is not considered as biogeochemical cycle A. Water cycle B. Nitrogen cycle C. Ozone cycle D. Oxygen cycle	1.5	CO 2
5	'The pH of rhizosphere is low.' Comment on the statement.	1.5	CO 1
6	The association which involves the exchange of nutrients between two species is referred to as	1.5	CO 2
7	Identify the phenomenon.	1.5	CO 3

			
8	Name one man made xenobiotic degrading bacteria, also called as ‘superbug.’	1.5	CO 1
9	Define biogeochemical cycle.	1.5	CO 2
10	A useful technique in ecology that was used to separate two similar sized phototrophic bacteria. a) FISH b) Stable isotope labelling c) Fluorescence activated cell sorting Sequencing	1.5	CO 1
11	Name the microbial associations which are called pollution indicators.	1.5	CO 3
12	Define BOD.	1.5	CO 1
13	Of the wastewater coming from 100 households versus wastewater from 2 households; which one may have higher BOD.	1.5	CO 2
14	The bioremediation process involving the usage of plants to degrade pollutants is (a) Composting (b) Biopile (c) Phytoremediation (d) Land farming	1.5	CO 2
15	At this stage of wastewater treatment, methanogenic microbes are the most significant (a) Sludge digestion (b) Primary treatment (c) Secondary treatment (d) Biological oxidation	1.5	CO 2
16	Lignin degradation in environment is mainly attributed to A) Bacteria B) Algae C) Fungi All of the above	1.5	CO 1
17	Define Mycorrhizza.	1.5	CO 2
18	Define bioremediation.	1.5	CO 2
19	‘A genetically modified organism was added to clean up grease.’ This process is called as	1.5	CO 2

20	Name some useful techniques in microbial ecology.	1.5	CO 1
Section B (4Qx5M=20 Marks)			
1	Define consortia. What type of interaction is it? What are the benefits of this interaction?	5	CO 1
2	Why is treatment of sewage water important? What are the steps in treatment of sewage water?	5	CO 4
3	What are hydrothermal vents? Give an account of microbial ecology in these vents.	5	CO 1
4	<p>Explain the interaction as given below in figure.</p> 	5	CO 1
Section C (2Qx15M=30 Marks)			
Q 1	<p>An oil spill occurred in gulf of Mexico a decade ago. Some suggestions were given by experts for its clean up like batch-wise treatment of water, taking it new location and doing remediation in small batches. Some suggested adding surfactants etc.</p> <p>(i) What is non-polluting way of remediation of oil spill? (3) (ii) Microbes secrete some substances which can help in oil clean up. What are they called? Give an example (2) (iii) Why is oil spill of concern and considered a pollutant? (2) (iv) In line with above question, name the microbes that are important in process and give details of one process. (3) (v) Are there any ways of remediation of soil with heavy metals? Explain with help of illustrations. (5)</p>	15	CO 2
Q 2	<p>There were microbes growing on barren land and suddenly after a setup of industry nearby; it first became white colored and then they vanished. There not many humans living in that area. Given this; answer the following:</p> <p>(i) What was this microbial association growing on barren land? (1) (ii) Why did it stop growing? (1) (iii) What are the types of this microbial association? (3)</p>	15	CO1

	(iv) What is the economic importance of this association? (2)		
	(v) What is the ecological significance of this association? (2)		
	(vi) Describe this association and its types. (6)		
Section D			
(2Qx10M=20 Marks)			
Q 1	Define enrichment. Explain it with an example.	10	CO4
Q 2	Illustrate and write about biogeochemical cycle of Nitrogen or Carbon.	10	CO1