


Name:			
Enrolment No:			
UNIVERSITY OF PETROLEUM AND ENERGY STUDIES End Semester Examination, May 2022			
Course: B.Sc. Microbiology Program: Agricultural and food microbiology Course Code: HSMB7007		Semester: IV Time : 03 hrs. Max. Marks: 100	
Instructions:			
Q.No	Section A Short answer questions/ MCQ/True and False	(20 x 1.5= 30 Marks)	COs
Q	Statement of question		
1.	Major useful product obtained from microalgae a. Vitamin b. Single cell protein c. Antibiotic d. All of the above	1.5	CO2
2.	Water activity (aw) is closely related to a) Relative humidity b) Moisture c) Water content d) Humidity	1.5	CO3
3.	Aflatoxin is produced by a) Bacteria b) Fungi c) Algae d) All of the above	1.5	
4.	Write example of a phosphate solubilizing bacteria.	1.5	CO1
5.	The process of denitrification involves conversion of nitrite to _____ a. Nitric oxide b. Nitrous oxide c. Dinitrogen d. Ammonia	1.5	CO1

6.	<p><i>Clostridium botulinum</i> produce botulinum toxins that are a</p> <ul style="list-style-type: none"> a) Neurotoxin b) Enterotoxins c) Vomitoxins d) Endotoxins 	1.5	CO4
7.	<p>Yeast and molds need minimum 0.65 water activity to grow</p> <ul style="list-style-type: none"> a) True b) False 	1.5	CO3
8.	<p>A heterocyst is _____</p> <ul style="list-style-type: none"> a. A type of spore b. A terminally differentiated cell that fixes nitrogen c. The progenitor of cyanobacterial vegetative cell d. A cell that carries out oxygenic photosynthesis 	1.5	CO1
9.	<p>_____ play a key role in the transformation of rock to soil.</p> <ul style="list-style-type: none"> a. Cyanobacteria b. Pectin decomposing bacteria c. Nitrifying bacteria d. De-nitrifying bacteria 	1.5	CO1
10.	<p>Which of the following molds known as bread molds</p> <ul style="list-style-type: none"> a) <i>Rhizopus stolonifer</i> b) <i>Aspergillus niger</i> c) <i>Fusarium sp.</i> d) <i>Candida</i> 	1.5	CO3
11.	<p>Rhizobium has symbiotic association with</p> <ul style="list-style-type: none"> a) Legumes b) Non-legume crops c) Sugarcane d) Paddy 	1.5	CO1
12.	<p>The advantage of plants in mycorrhizal association is</p> <ul style="list-style-type: none"> a) Food b) Protection c) Increased mineral absorption and disease protection d) All of above 	1.5	CO1

13.	Endomycorrhizal association is found in a) 85% of the plant families b) 40 % of the plant families c) 10 % of the plant families d) Less than 5% of the plant families	1.5	CO1
14.	The principal microorganism for yogurt is <hr/> a) <i>Lactobacillus bulgaricus</i> b) <i>Leuconostoc citrovorum</i> c) <i>Lactobacillus acidophilus</i> d) <i>Streptococcus lactis</i>	1.5	CO3
15.	<i>Bacillus thuringiensis</i> produce a) Insecticidal toxins b) Nematocidal toxins c) Fungicidal toxins d) Virucidal	1.5	CO2
16.	The most food spoilage bacteria grow at _____. (a) Acidic pH (b) Neutral pH (c) Alkaline pH (d) All of the above	1.5	CO3
17.	The microbiological examination of coliform bacteria in foods preferably use _____. a) Mac Conkey broth b) Violet Red Bile agar c) Eosine Methylene blue agar d) LB agar	1.5	CO3
18.	If wheat field is inoculated with Rhizobium a. Soil will become nitrogen rich b. Soil will become rich in calcium c. No effect on soil nitrogen d. Soil will be depleted of nitrogen	1.5	CO1
19.	pH is intrinsic factors for microbial growth? a) True b) False	1.5	CO4
20.	Food preservation involves a) Increasing shelf life of food b) Ensuring safety for human consumption c) Both a and b d) Enhancing the food spoilage	1.5	CO4
	Section B	(4 x 5=20 Marks)	CO

Q			
1.	Discuss the advantages and disadvantages of bio-fertilizer use over chemical fertilizer	5	CO1
2.	Give one example of following bio-fertilizer a) Free-living nitrogen fixer b) Plant growth promoting rhizobacteria (PGPR) c) Symbiotic nitrogen fixer d) Blue green algae e) Aquatic fern that fix nitrogen	5	CO1
3.	What is the carrier based inoculant? Write the ideal property of a PGPR carrier material?	2+3=5	CO2
4.	a) How GMO differ from plant breeding? b) Comments for or against the statement that “GMO crops are safe”	2+3=5	CO2
	Section C	(2 x 15=30 Marks)	
Q	Statement of question (Case studies)		CO
1.	You are working on a project to improve soil nutrient content by using different types of biofertilizers. During soil testing you found that it contains insolubilized phosphate and the amount of total nitrogen fixing microbes in the soil was less. a) Suggest a suitable method to solubilize the phosphate. b) What types of plants and nitrogen fixer you will choose to improve the symbiotic nitrogen fixer in the soils? Explain with example. c) What types of lab-grown PGPR you can utilize to improve the number of free-living nitrogen fixer? d) How you will add biofertilizer to crop or cropland?	2+5+3+5=15	CO2
2.	In a hospital some school children have been admitted due to health issues like acute diarrhea, vomiting, abdominal cramps, difficulty in swallowing, muscle weakness, and double vision. Upon examination of the children doctor found that all of them ate home-made canned food 2-3 h before their health issues started. a) Can these cases be regarded as food intoxication or food infection? Justify your answer. b) What type of microbe is associated with the above cases? c) What types of tests are recommended of the microbe? d) Give examples of other such food-borne health issues. e) What types of precautionary measure should be taken to avoid such health hazards?	5+2+2+2+4=15	CO4
	Section D	(2 x10 =20 Marks)	
Q	Statement of question		CO

1.	a) What is bio-control? b) Write some bio-control agents for pest control. c) What are the advantages and disadvantages of using such agents?	2+3+5=10	CO2
2.	a) How do intrinsic and extrinsic factors affect the quality of a food? b) Discuss techniques for effective food preservation.	5+5=10	CO4