

B. Sc. BIOTECHNOLOGY

6TH SEMESTER

Environmental Biotechnology, Bioethics, IPR & Legal Issues

BBT- 26

Duration: 3 Hrs.

Marks: 70

{ Part : A (Objective) = 20 }
{ Part : B (Descriptive) = 50 }

[PART-B : Descriptive]

Duration: 2 Hrs. 40 Mins.

Marks: 50

[Answer question no. One (1) & any four (4) from the rest]

1. Define extremophiles and give examples. Write in brief about psychrophiles and acidophiles. Explain the survival strategies of thermophiles. 2+5+3
=10
2. What is MEOR and explain the mechanisms for oil recovery. Add a note on secondary waste water treatment. 5+5=10
3. Explain the whole process of solid waste treatment. 10
4. Explain the process of bioleaching mentioning the organism, steps and reaction involved in the process. 10
5. What do you mean by bioremediation? Define *in situ* and *ex situ* bioremediation? Explain different techniques for bioremediation. 2+3+5
=10
6. *Write short notes on:* 5+5=10
 - (a) phytoremediation
 - (b) myco-remediation
7. *Write short notes on:* 5+5=10
 - (a) Geographical Indication
 - (b) Trademark
8. What is biopiracy and how it is affecting in the whole Traditional Knowledge Domain? Write the case study of turmeric biopiracy. 5+5=10

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[PART-A : Objective]

Choose the correct answer from the following:

1X20=20

1. Extremophiles are most commonly what type of microorganism?
 a. Algae
 b. Protozoans
 c. Archae
 d. All of the above
2. Halophiles are organisms that require _____
 a. A salt concentration at least 0.2M
 b. High temperature
 c. Acidic environment
 d. None of the above
3. MEOR mechanism includes
 a. Interfacial tension reduction
 b. Selective plugging
 c. Gas production
 d. All of the above
4. The C/N ratio of organic materials tend to _____ during the composting period
 a. Increase
 b. Remain same
 c. Decrease
 d. First increase and then decrease.
5. Trickling filters and rotary biological contractors are the examples of
 a. Primary waste water treatment
 b. Secondary waste water treatment
 c. Tertiary waste water treatment
 d. None of the above
6. BOD is
 a. A measure of the organic matter presents in water
 b. Usually less than COD
 c. Biochemical oxygen demand
 d. All of the above
7. What categories of microorganisms are used for the waste water treatment?
 a. Aerobic
 b. Anaerobic
 c. Methanogens
 d. All of the above
8. A major organism used in commercial bioleaching for copper recovery is
 a. *Pseudomonas aeruginosa*
 b. *Thiobacillusferrooxidans*
 c. *Aspergillusniger*
 d. All of the above
9. In waste water treatment, the purpose of coagulation and flocculation is to
 a. Disinfect the water supply
 b. Remove organic matter and suspended fine particles
 c. Soften water by removing calcium and magnesium
 d. Remove taste and odour problems
10. Which of the following bacterium is called as the superbug that could clean up oil spills
 a. *Bacillus subtilis*
 b. *Pseudomonas putida*
 c. *Pseudomonas denitrificans*
 d. *Bacillus denitrificans*
11. Which of the following microbe is widely used in the removal of industrial wastes
 a. *Trichodermap*
 b. *Aspergillusniger*
 c. *Pseudomonas putida*
 d. All of the above
12. Which of the following is the advantage of using myco-remediation over commercial technologies
 a. Safe
 b. Low cost
 c. Public acceptance
 d. All of the above
13. Environmental factors influencing in-situ bioremediation
 a. Soil type
 b. Nutrient availability
 c. Both (a) and (b)
 d. None of the above
14. Which of the following is an advantage of phytoremediation
 a. The cost of the phytoremediation is lower than that of traditional processes both *in situ* and *ex situ*
 b. The plants can be easily monitored
 c. The possibility of the recovery and re-use of valuable metals (by companies specializing in "phyto mining")
 d. All of the above

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Question Paper CUM Answer Sheet

PART (A) : OBJECTIVE

Serial no. of the main
Answer sheet

15. *Ex situ* bioremediation involves the
 a. Degradation of pollutants by microbes directly
b. Removal of pollutants and collection at a place to facilitate microbial degradation
c. Degradation of pollutants by genetically engineered microbes
d. None
16. Who filed a case against the US patent on medicinal use of turmeric?
 a. CSIR
b. UGC
c. IARI
d. Government of India
17. Following is included in trademark
 a. Letters and words
b. logos
c. Product shapes
d. All of the above
18. To protect the rights of authors which of the following can be applied
 a. trademark
b. Copyright
c. patent
d. None of the above
19. Which of the following is an example of Geographical Indication
 a. Tezpur Litchi
b. Darjeeling tea
c. Both of the above
d. None of the above
20. WIPO stands for
 a. World Intellectual Property Organization
b. World International Pollution Organization
c. World Intellectual Property Office
d. None of the above

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Course :

Semester : Roll No :

Enrollment No : Course code :

Course Title :

Session : 2016-17 Date :

Instructions / Guidelines

- > The paper contains twenty (20) / ten (10) questions.
- > The student shall write the answer in the box where it is provided.
- > The student shall not overwrite / erase any answer and no mark shall be given for such act.
- > Hand over the question paper cum answer sheet (Objective) within the allotted time (20 minutes / 10 minutes) to the invigilator.

Full Marks	Marks Obtained	Remarks
20		

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Scrutinizer's Signature

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Examiner's Signature

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Invigilator's Signature