

**BBL341 Environmental Biotechnology**  
**MAJOR (Sem II, 2018-19)**

Date: 4th May 2019

Max Marks: 40 marks

Duration: 2 h

1. LD<sub>50</sub> for *fungus A* is  $1 \times 10^6$  spores, while that for *fungus B* is  $1.5 \times 10^7$  spores. Which one is more efficient in terms of its pathogenicity? How will your answer change if the values mentioned above are for ID<sub>50</sub>. 3
  
2. Describe any two challenges when performing *risk assessment* in the ecosystem? 3
  
3. State True or False (**100% negative marking**). 4
  - (a) Bioaugmentation is the process of enhancing the activity of resident microbes for remediation.
  - (b) Microbial Source Tracking refers to finding the causal agent of a particular disease.
  - (c) In DGGE the separation of bands is on the basis of differences in size
  - (d) The number of culturables is higher in "rhizosphere" than in "bulk" soil.
  
4. Which of the two processes contribute to increased soil fertility in terms of N content: nitrification or denitrification? How? 2
  
5. During lysis for DNA extraction from microbial cells, give two examples for each of the following method: 3
  - (a) Enzymatic
  - (b) Chemical
  - (c) Physical

6. Microbial Enhanced Oil Recovery is adopted as \_\_\_\_\_ (primary/secondary/tertiary) method for recovery. On which principles is oil recovery enhanced upon employing microorganisms? Which features make a microbe efficient in such a process? 5
7. What kind of organization is present in a biofilm? 2
8. Why is sampling of soil considered more tedious than sampling air and water? 2
9. Which of the three sampling types would be preferred: grab sample, composite sample or continuous monitoring, in the following cases? State with reason(s) 5
- a) To study the contamination of fish in a river where a tanning industry company discharges its wastewater.
  - b) To identify accidental release of oil by pipelines of a refinery.
  - c) To implement strategies to reduce smog formation in your city.
  - d) To identify stubble burning as a factor contributing to smog formation in the area.
  - e) To determine if vegetable from a sprayed kitchen garden are contaminated with pesticides.
10. Define: keystone species, ammensalism, phytostimulation, mixotrophy, ARDRA 5
11. Mention two means (for each) of increasing bacterial culturability by modification of (a) growth medium (b) growth conditions 4
12. What are the two factors for limited success in bioremediation of Nallah in campus (Tanuj's case study)? 2