[A-97]

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SARDAR PATEL UNIVERSITY
B. Sc. Semester- VI
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MICROBIOLOGY
US06CMIC05 – Agriculture and Environmental Microbiology

Date: 06/04/2016, Wednesday

Time: 02:30pm to 05:30pm **Marks: 70**

Q-1 Select the right answer: **[10]**

1. Specificity in the *Rhizobium*-legume interaction is due to
   a. Early nodulins
   b. Laghaemoglobin
   c. Late nodulins
   d. None of these
2. _____ the main components of the paracrystalline inclusions are the polypeptides of 130 to 140 KDa are called as:
   a. Endotoxin
   b. Exotoxin
   c. Protoxin
   d. Haemotoxin
3. Which of the following can be used as carrier for biofertilizer?
   a. Peat
   b. Lignite
   c. Charcoal
   d. All of these
4. Which is/are the commercial method/s of bioleaching?
   a. Slope leaching
   b. In situ leaching
   c. Heap leaching
   d. All of these
5. _____ and _____ enzymes produced by bacteria convert TCE to TCE epoxide during their growth on methane and toluene respectively.
   a. Catalase and Peroxidase
   b. Methane monooxygenase & Toluene monooxygenase
   c. Lipase and Protease
   d. None of these
6. _____ branching of ABS interferes with the biodegradation.
   a. Amino acid
   b. -SH
   c. Methyl
   d. None of these
7. When Polychlorinated Biphenyls with five or more chlorine groups are treated by micro organisms, chlorine groups are removed by
   a. Anaerobic respiration
   b. Anaerobic dehalogenation
   c. Aerobic dehalogenation
   d. Aerobic dehydrogenation
8. Methanogenic bacteria produces methane under _____ condition.
   a. Anaerobic
   b. Microaerophilic
   c. Both a and b
   d. None of these
9. _____ is considered to be non biodegradable under anaerobic condition
   a. Cellulose
   b. Hemicellulose
   c. Chitin
   d. Lignin
10. Landfill sites- a type of digester is employed for
    a. Liquid wastes
    b. Solid wastes
    c. Semisolid wastes
    d. All of these

Q-2 Answer the following in brief (Any Ten) **[20]**

1) Give reason: *nod ABC* are called common nod genes.
2) What are microbial inoculants and broadly classify biofertilizers.
3) Write in short about BT-δ endotoxin.
4) How would you prevent biodeterioration of wood.
5) What is MEOR and how it can be enhanced?
6) Write in short about indirect bioleaching mechanism.
7) Define Biomagnification and give one example.
8) Give few examples of different compounds that produces environmental problems.
9) What are Xenobiotic and Recalcitrant compounds?
10) What precautions one should take while producing biogas?
11) Explain continuous flow stirred tank digesters for biogas production.
12) Define renewable and non renewable energy resources with examples.

Q-3 Write in detail on the production of *Rhizobium* biofertilizer. **[10]**

OR

A Explain the series of interaction that takes place between *Rhizobia* and leguminous plants for nodule formation. **[05]**

B Explain the structure and mechanism of nitrogenase. **[05]**

Q-4 What do you know about bioleaching? Write in detail about bioleaching of copper by suitable methods and mechanisms. **[10]**

OR

A Write a note on bioremediation of chlorinated compounds. **[06]**

B Explain: Biodeterioration of paint **[04]**

Q-5 **A** Write a note on biodegradation of oil pollutants. **[06]**

B Explain biomagnifications by giving a suitable example. **[04]**

OR

A Write a note on biodegradation of ABS. **[05]**

B Write a note on biodegradable polymers. **[05]**

Q-6 **A** What are bio-fuels? Explain the advantages and disadvantages of biofuels. **[05]**

B What is biogas? Explain gobar gas plant. **[05]**

OR

Discuss in detail substrate and micro organisms involved in biogas production. **[10]**

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