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SARDAR PATEL UNIVERSITY
M. Sc. FOURTH SEMESTER EXAMINATION
DATE: 05-04-2016

PS04CBIT02: ENVIRONMENTAL BIOTECHNOLOGY
TIME: 2.30 TO 5.30 P.M. MAX.MARKS: 70

- Q-1 Select most appropriate answer from the given choices. (08)
1. In anaerobic digesters, bacteria producing acetate and H₂ from fatty acids are called....

a) Acidogenic bacteria	c) Heteroacetogens
b) Acetoclastic bacteria	d) Hydrolytic bacteria
 2. Bioavailability of PCB can be enhanced by microbial production of..

a) Siderophores	c) Exopolysaccharides
b) Biosurfactants	d) All of the above
 3. Which of the following is not true for anammox process?

a) It requires anaerobic conditions	c) Nitrate acts as electron acceptor
b) It leads to oxidation of ammonia	d) Nitrite acts as electron acceptor
 4. Carroussel ditch is advantageous over activated sludge process because of
 5. Ring cleavage of catechol is catalysed by a.....
 6. The process of converting environmental pollutants into harmless products by natural microflora and environmental conditions is called.....
 7. Darcy unit is a measure of
 8. A biotechnological process which removes the arsenopyrite from gold ore to produce a higher grade concentrated gold ore is called

- Q-2 Answer **any seven** short questions. (14)
- a What are NPV? Write their application.
 - b Explain the terms: 1. NOD 2. C BOD
 - c What is cometabolism? Explain with example.
 - d Give four reasons for poor settling of sludge in activated sludge process.
 - e List the conditions favoring nitrification in activated sludge process.
 - f Write the applications of lignin degrading enzymes.
 - g List the criteria to judge stability of compost.
 - h Explain the competition between methanogens and sulfate-reducing bacteria during anaerobic digestion.
 - i Explain the environmental importance of sulfur removal from coal.

(1)

(P.T.O)

- Q-3A Explain the operational parameters of suspended growth processes for effluent treatment and discuss their significance. (06)
- Q-3B Answer the following. (3+3)
- a) Explain the biofilm formation and sloughing in fixed film processes for waste water treatment.
- b) Explain the fluidized bed process.
- OR
- Explain the mechanism of enhanced biological phosphorous removal from waste water and describe any one efficient process for the same. (06)
- Q-4A Write in detail on up flow anaerobic sludge blanket process and compare it with anaerobic filter. (06)
- Q-4B Write in detail on bioconversion of solid wastes into compost. (06)
- OR
- Answer the following (3+3)
- a) List the advantages of microbiotests for toxicity analysis in waste water treatment plants
- b) Explain the principles of any two microbiotests.
- Q-5A Write in detail on biodegradation of aliphatic and aromatic hydrocarbons. (06)
- Q-5B What is biostimulation? Explain the bioremediation of polluted sites by biostimulation approach with suitable examples. (06)
- OR
- Explain the design and working of any two reactors used for biological waste gas purification. (06)
- Q-6A Explain the structure, diversity and mode of action of insecticidal toxins of *B. thuringiensis*. (06)
- Q-6B Explain in detail the mechanisms and processes for bioleaching. (06)
- OR
- Discuss the potential of microbes and their metabolites in enhanced oil recovery. (06)
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