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0208M137

Candidate's Seat No :_____

B.Sc. Sem.-6 Examination

CC - 310

Bio-Technology

Time : 2-00 Hours] **August 2021** **[Max. Marks : 50**

Paper 310: Environmental Biotechnology.

1. (A) Discuss various methods for solid waste treatment and give its importance. 7
   (B) Describe methods for testing drinking water. 7
2. (A) Describe Indian standards for safe drinking water. 7
   (B) Explain treatment of liquid waste by activated sludge process. 7
3. (A) Discuss the relationship between molecular structure and Biodegradability giving suitable examples. 7
   (B) Explain abatement of harmful wastes by Bioventing and Bioslurping. 7
4. (A) Describe material prone to biodeterioration and means to control it. 7
   (B) List heavy metals acting as pollutant and explain its sources and harmful Effects. 7
5. (A) Explain principle of microbial leaching and describe popular designs for mining by leaching. 7
   (B) Discuss biotechnological uses of Cellulose and Lignins as substrate. 7
6. (A) Explain sources and advantages of Methane and Hydrogen fuels. 7
   (B) Discuss principle of Microbially-enhanced Oil Recovery. 7
7. (A) Write a detailed note on Environmental Impact Assessment. 7
   (B) Explain harmful effects and controls of Sea-weed and algal blooms. 7
8. (A) Describe the sources of Green-house gases and its harmful effects. 7
   (B) Summarize importance of biodiversity and means to conserve it. 7

9. Answer the following (Any Eight) 8

Q-1 Which of the following approach is used for the treatment of solid wastes, in which waste is dumped into pits?

A Biofilters
B Incineration
C Landfills
D Anaerobic digestion

Q-2 How can Biotechnology contribute to waste treatment and environment management?

A Development of microorganism with novel capabilities of degradation.
B Development of Cleaner technologies which generate less pollutants
C Promote the use of recalcitrant chemical pesticides as biocontrol agents
D Both A and B

Q-3 Landfill sites can be useful in which of the following ways?

A As a source of Biogas and sites to develop landscape gardens
B Source of toxic and corrosive material
C Increase the population of disease vectors like flies
D All of these

Q-4 Which of the following is Not True about eutrophication?

A Promotes microbial and plant growth by providing anaerobic waste water treatment.
B Addition of organic matter and inorganic nutrients to the natural reservoirs like river.

P.T.O

C Addition of waste water into the river to promote aerobic digestion.
D Eutrophication sometimes raises the river water temperature.

Q-5 Find the correct statement.
A Xenobiotic compounds like halogenated and aromatic hydrocarbons are only toxic to the prokaryotes.
B Mostly recalcitrant xenobiotic compounds are hydrophilic in nature.
C Xenobiotic compounds never enter into the food chain and food web
D DDTs and PCB's have been found in human tissues in sublethal concentration due to the biomagnification phenomenon.

Q-6 Identify the correct pair.
A CHCl3 DDT and BHC - Halocarbons
B Recalcitrant xenobiotic compounds – Highly unstable
C BOD – Biodegradable oxygen demand
D BOD – estimate amount of chemically oxidisable organic matter present in water.

Q-6 The correct relation between Biochemical oxygen demand (BOD) and Chemical oxygen demand (COD) is given by_____?
A BOD>COD
B COD>BOD
C COD=BOD
D None of these

Q-7 BOD measures
A Biologically oxidizable organic matter.
B Number of pollutants in waste water.
C Industrial pollution.
D All of these.

Q-8 The term Municipal solid waste includes
A Mining wastes
B Agro-wastes
C Household, commercial and institutional wastes
D All of these

Q-9 Which of the following disadvantages are of in situ bioremediation?
A Low cost
B Seasonal variation of indigenous microbial activity due to environmental factors.
C Both A and B
D Includes minimal site disruption

Q-10 Which of the following waste disposal methods produce polluting gases?
A Landfill
B Incineration
C Bioventing
D Bioreactor

Q-11 The bioremediation technique includes contaminated solod materials + microorganisms + water formulated into slurry is called.
A Aerated lagoons
B Low -shear airlift bioreactor
C Fluidized- bed soil reactor
D All of these.

Q-12 At this stage of waste water treatment, settle sewage is formed
A Preliminary treatment
B Secondary treatment
C Primary treatment
D Sludge treatment

Q-13 During tertiary waste water treatment, phosphate is usually removed by
A Filtration
B Precipitation using lime or alum
C Lagooning
D Slow sand filters

Q-14 Microorganisms can remove metals by which of the following mechanism?
A Adsorption and precipitation
B Complexation
C Volatilization
D All of these

Q-15 _____ approach promotes biodegradation by stimulating indigenous microorganisms' growth at the contaminated site.
A In situ intrinsic bioremediation
B In situ engineered bioremediation
C Ex situ intrinsic bioremediation
D Ex situ engineered bioremediation

Q-16 Bioslurping in situ bioremediation technology includes
A Soil washing + vitrification
B Bioventing + vacuum enhanced pumping
C Land farming
D Soil vapour extraction

Q-17 _____ are the most common contaminants found in hazardous sites according to EPA
A PCBs
B Heavy metals
C VOCs
D All of these

Q-18 What is True about Bioventing?
A Injection of air into the groundwater to provide oxygen for groundwater remediation.

P. T. O.

B Needs water to receive air flow and get some humidity to be dispersed into dry soil
C Both A and B
D Promotes aeration of the unsaturated vadose zone of the contaminated soil to stimulate aerobic biodegradation.

Q-19 Carrots are used to absorb DDTs can be explained by ____ phytoremediation technique.
A Rhizofilteration
B Phyto stabilization
C Phytoaccumulation
D Phytovolatilization

Q-20 Bioleaching can be defined as
A Metals are dissolved from ore bearing rocks using microorganism.
B Recovery of low-grade ores which cannot be economically processed with chemical methods.
C Both A and B
D None of these