



SEAT No. _____

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[13/A-8]

SARDAR PATEL UNIVERSITY

B.Sc. Semester – VI

4th October 2022, Tuesday

MICROBIOLOGY : US06CMIC05

Agricultural and Environmental Microbiology

Time: 3.30 to 5.30 Am

Total Marks:70

(10)

Q.1. Select the most appropriate answer.

1. Spore dust containing *Bacillus popilliae* and *Bacillus lentimorbus* has been marketed under the trade name -----.
(a) Boom
(b) Chrome
(c) Noon
(d) none of the above
2. Thuricide is
(a) a probiotic
(b) a decolorizer
(c) an example of paint
(d) none of the above
3. Anabaena is a cyanobacterium that establishes a symbiotic relationship with
(a) Azolla
(b) Peas
(c) Clover
(d) none of them
4. Which of the following is an ore of copper?
(a) pitchblende
(b) uraninite
(c) chalcopyrite
(d) all of the above
5. Commercial methods of bioleaching includes
(a) slope leaching
(b) insitu leaching
(c) heap leaching
(d) all of the above
6. Customblen is
(a) a biopesticide
(b) a pollutant
(c) a type of fermented milk
(d) none of the above
7. Chlorinated hydrocarbons are dechlorinated by
(a) β oxidation
(b) aerobic dehalogenation
(c) anaerobic dehalogenation
(d) none of the above
8. Most rapidly degraded petroleum hydrocarbon compounds are of
(a) long chain length
(b) short chain length
(c) intermediate chain length
(d) none of the above
9. Methanogenic bacteria produce methane under
(a) aerobic conditions
(b) thermophilic conditions
(c) microaerophillic conditions
(d) none of the above
10. Biogas mainly contains
(a) CO₂
(b) CH₄
(c) H₂ and other gases
(d) all of the above

PTO

Q.2 (a) Fill in the blanks

(08)

- (1) Dinitrogenase reductase is encoded by -----.
- (2) Xanthan gums are produced by -----.
- (3) Protham is a ----- herbicide.
- (4) ----- is the total cellular dry weight or organic material produced by microorganisms.

(b) State whether the following are true or false

- (1) Dinitrogenase protein consists of 3 identical polypeptides.
- (2) *Sulfolobus acidocaldarius* is involved in the bioleaching of copper.
- (3) 1,1,1 trichloro 2,2 bis (p chlorophenyl) ethane is commonly known as DDT.
- (4) The use of nonrenewable energy sources has been fuelled by industrial development and industrialized nations derive 57% of their energy needs from non renewable sources.

Q.3. Attempt any ten out of the following.

(20)

1. What is GFP? What is its use?
2. Define biofertilizer.
3. Give four examples of fungi which can be used as microbial insecticide.
4. What is graphitization?
5. Cite two examples of microorganisms used for bioleaching of copper.
6. Which organisms are mainly found to be involved in the biodeterioration of wood?
7. Define (i) xenobiotic compounds (ii) recalcitrant compounds.
8. Which of the alkanes is degraded most rapidly? Why?
9. Give two examples of recalcitrant herbicides.
10. Which precautions must be taken during the production of biogas?
11. Enlist various digesters used in biogas production.
12. Enlist factors affecting biogas yield.

Q.3. Attempt any four out of the following.

(32)

1. Describe biofertilizer production using *Rhizobia*.
2. Write a note on symbiotic nitrogen fixation.
3. Write a note on biodeterioration of metals and paints.
4. Describe the bioremediation of petroleum hydrocarbons.
5. (a) Describe the biodegradation of chlorinated hydrocarbons.
(b) Write a note on biomagnification.
6. (a) Describe the biodegradation of oil pollutants.
(b) Write a note on biodegradable polymers.
7. Explain biogas production in detail.
8. Write notes on (i) Microorganisms involved in biogas production.
(ii) Advantages and disadvantages of biogas production

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