REV-01
BBT/01/06

2024/07

SET A

B.Sc. BIOTECHNOLOGY
SIXTH SEMESTER [SPECIAL REPEAT]
ENVIRONMENTAL BIOTECHNOLOGY
BBT-603

[USE OMR SHEET FOR OBJECTIVE PART]

Duration: 3 hrs. **Full Marks: 70**

Objective

Time: 30 mins. **Marks: 20**

Choose the correct answer from the following: ***1×20=20***

1. *Natronobacterium* are growing in the:
   a. pH 8-10 b. pH 9-11
   c. pH 4-6 d. None of these
2. Serine protease are derived from:
   a. Alkaliphiles b. Acidophiles
   c. Extremophiles d. None of these
3. Cellulases are used in:
   a. Waste water treatment b. Food additives
   c. Both a & b d. All of these
4. Optimum temperature of thermophiles
   a. 55-65° C b. 40-50° C
   c. 65-75° C d. 80° C
5. Which is NOT methanogenic microorganism?
   a. Methanobacterium b. Methanomonas
   c. Methanobacillus d. Methanosarcina
6. Which is NOT acid forming microorganism?
   a. *Lactospirillum* sp. b. *Lactobacillus* sp.
   c. *Staphylococcus* sp. d. None of these
7. Which is NOT an Aerobic attached growth systems of sewage treatment?
   a. Trickling filter b. Roughing filter
   c. Oxidation ditch d. None of these
8. Conversion of ammonia to nitrate is known as:
   a. Natrofication b. Nitrification
   c. Nitrofication d. Nitrifraction
9. Which are NOT involved in trickling filter?
   a. *Flavobacterium* b. *Stigeoclonium*
   c. *Chlorella* d. *Escherichia coli*
10. Which microorganism causes Gastroenteritis?
    a. *Salmonella typhi* b. *Vibrio cholerae*
    c. *Escherichia coli* d. *Shigella sp.*

11. Which is responsible for Amoebic dysentery?
    a. *Entamoeba histolytica*
    b. *Giardia lamblia*
    c. *Balantidium coli*
    d. None of these

12. Which compound is used for colilert technique?
    a. *ONPG*
    b. *MLFG*
    c. Both a & b
    d. None of these

13. Which is following involved in coliform test?
    a. *Enterobacter aerogenes*
    b. *Aerobacter aerogenes*
    c. *Escherichia coli*
    d. All of these

14. Which of the following is used as coagulant aid?
    a. Activated silica
    b. Soda ash
    c. Iron salts
    d. None of these

15. Bioremediation:
    a. Usage of microbes to create new organisms
    b. Usage of anaerobic bacteria to create new antibiotics
    c. Usage of microbes to destroy environmental pollutants
    d. Usage of aerobic bacteria to create new vaccines

16. A process using microbes to convert toxic industrial wastes to less toxic or non-toxic compounds is:
    a. Precipitation
    b. Complement fixation
    c. Bioconversion
    d. Bioremediation

17. This cleanup approach includes removal of groundwater or soil from its natural setting to permit for bioremediation:
    a. Bioaugmentation
    b. *in situ* bioremediation
    c. *ex situ* bioremediation
    d. Phytoremediation

18. Bioaugmentation involves:
    a. Eliminating sludge
    b. Plants usage for bioremediation
    c. Addition of microbes to a cleanup site
    d. Bioventing

19. .....bacterium can withstand the dosage of radiation, which are several times higher than what human cells can tolerate.
    a. *Escherichia coli*
    b. *Deinococcus radiodurans*
    c. *Conus magus*
    d. *Staphylococcus aureus*

20. Composition of Denaturing gradient gel in DGGE:
    a. Acrylamide
    b. Urea
    c. Formamide
    d. All of these

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Descriptive

Time : 2 hr. 30 mins. **Marks : 50**

[Answer question no.1 & any four (4) from the rest]

1. Give details on the classification of sewage treatment process. Brief on primary treatment. 3+7=10

2. Write short notes on: (*any two*) 5+5=10
   a) Heavy metal remediation
   b) Myco-remediation
   c) Phytoremediation

3. Explain FAME analysis along with the principle and procedure. 2+3+5=10

4. Describe details on anaerobic suspended growth treatment process. 10

5. What is bioremediation? Differentiate between in situ and ex situ bioremediation. Give a brief account on plant used in environmental clean-up. 2+3+5=10

6. Write short notes: (*any two*) 5+5=10
   a) ADRA
   b) Metagenomics and Transcriptomics
   c) DGGE

7. Give details on the composting method of solid waste management? (with appropriate pictorial representation) 10

8. Write short notes: 5+5=10
   a) BOD
   b) Multiple tube fermentation technique

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