**TU/ CODL**

**TEZPUR UNIVERSITY**

**SEMESTER END EXAMINATION (SPRING) 2019**

**DEM 103: URBAN WATER MANAGEMENT**

Time: **3 Hours** Total Marks: **70**

*The figures in the right-hand margin indicate marks for the individual question.*

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1. Choose the correct options: 1x10=10

1. Which of the following techniques is/are not used for developing alternative source/s of water?
2. Desalination
3. Rain water harvesting
4. Waste water reuse
5. Water pricing
6. Which of the following soils have the maximum infiltration capacity?
7. Sandy
8. Layey
9. Silty
10. loessic
11. Which of the following factor/s influence the infiltration rate?
12. Soil texture
13. Soil moisture content
14. Soil structure
15. All of these
16. Water quality monitoring does/do not involve which of the following step/s?
17. Assessment of Resources Availability
18. Reconnaissance Survey
19. Water auditing
20. Quality Assurance

**P.T.O.**

1. Which of the following step is not involved in tertiary treatment of waste water?
2. Removal of suspended biological matter
3. Removal of excess nutrients such as nitrogen and phosphorus
4. Removal of recalcitrant organic compounds
5. Removal of dissolved solids
6. Which of the following is/are not the purpose/s of aeration in water treatment?
7. To reduce the concentration of taste and odor causing substances
8. To oxidize iron and manganese, rendering them insoluble
9. Dissolve a gas in the water
10. To remove dissolved and suspended particles
11. Which of the following is not a coagulant chemical used in water treatment?
12. Alum
13. Ferric sulfate
14. Sodium aluminate
15. Ferric hydroxide
16. Which of the following statement is not true?
17. Constructions for Atomic Energy Plants and Defense requirements is permitted in CRZ-I
18. Development of vacant plots between 200 and 500 m of High Tidal Line is permitted in CRZ-I for the purpose of construction of dwelling units.
19. Development of facilities required for disposal of treated effluents is permitted in CRZ-I
20. Development of port related water front activities is permitted in CRZ-I

I) What is COD?

1. Chemical oxygen depletion
2. Chemical oxygen demand
3. Chemo-ecological oxygen deprivation
4. Chemical oxidation demand

j) Vermicomposting is-

1. Natural organic manure produced from the excreta of earthworms fed on organic waste.
2. Natural organic manure produced from dead earthworms in organic waste.
3. Synthetic fertilizers produced in laboratories from earthworms.
4. None of these

2. Explain how soil properties affect infiltration rate 8

3. Write three differences between each of the following: 3x3=9

1. Natural and anthropogenic source of water pollution
2. Osmosis and reverse osmosis
3. Grey water and black water

4. Explain the problem of urban flood and give some counter measures. 7+5=12

5. What is rain-water harvesting? What are the advantages and benefits of

rainwater harvesting? 5+3+3=11

6. Describe the role of soil type in rain water infiltration rate. What types of

soil allows the greatest amount of rainfall to soak in? 8+2=10

7. Explain the changes in water resources and water use due to global

Warming. 10

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