**TU/ CODL**

**TEZPUR UNIVERSITY**

**SEMESTER END EXAMINATION (SPRING) 2020**

**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 option/s: 1x10=10

1. Which of the following techniques is/are not used for developing

alternative source/s of water?

1. Desalination
2. Rain water harvesting
3. Waste water reuse
4. Water pricing
5. Which of the following soils have the maximum infiltration capacity?
6. sandy
7. clayey
8. silty
9. loessic
10. Which of the following factor/s influence the infiltration rate?
11. soil texture
12. soil moisture content
13. soil structure
14. all of the above
15. Water quality monitoring does/do not involve which of the following step/s?
16. Assessment of Resources Availability
17. Reconnaissance Survey
18. Water auditing
19. Quality Assurance
20. Which of the following step is not involved in tertiary treatment of waste water?
21. removal of suspended biological matter
22. removal of excess nutrients such as nitrogen and phosphorus
23. removal of recalcitrant organic compounds
24. removal of dissolved solids

**P.T.O.**

f) Which of the following is/are not the purpose/s of aeration in water

treatment?

1. to reduce the concentration of taste and odor causing substances
2. to oxidize iron and manganese, rendering them insoluble
3. dissolve a gas in the water
4. to remove dissolved and suspended particles

g) Which of the following is not a coagulant chemical used in water

treatment?

1. alum
2. ferric sulfate
3. sodium aluminate
4. ferric hydroxide

h) Which of the following statements is ***not true***.

1. Constructions for Atomic Energy Plants and Defense requirements is permitted in CRZ-I
2. 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.
3. Development of facilities required for disposal of treated effluents is permitted in CRZ-I
4. Development of port related water front activities is permitted in CRZ-I

I) What is BOD?

1. biological oxygen depletion
2. biological oxygen demand
3. bio-ecological oxygen deprivation
4. biological 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. State True or False- 1x6=6

1. The Urban Heat Island Effect (UHI) is a phenomenon whereby the air over the rural areas becomes slightly warmer compared to surrounding urban areas.
2. Increased urban water demand generates pressure on existing infrastructure and the problem is more severe in developing countries.
3. Solid waste management also includes agricultural waste.
4. In the osmosis process, demineralization water is produced by forcing water through semi permeable membranes at high pressure.
5. Agricultural runoff is an example of point source of pollution.
6. Continuous sources introduce contaminants to the streams for extended periods of time

3. State three differences each between the following- 3x3=9

1. point and non-point 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. 10+5=15

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

harvesting? 5+5=10

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

types of soil allow 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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