**TU/CDOE**

**TEZPUR UNIVERSITY**

**SEMESTER END EXAMINATION (SPRING 2023)**

**DIPEVMD/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: **1x10=10**
2. Which of the following techniques is/are not used for developing alternative source/s of water?
3. Desalination (c) Wastewater reuse
4. Rainwater harvesting (d) Water pricing
5. Which of the following soils have the maximum infiltration capacity?
6. sandy (c) silty
7. clayey (d) loessic
8. Which of the following factor/s influence the infiltration rate?
9. soil texture (c) soil structure
10. soil moisture content (d) all of these
11. Water quality monitoring does/do not involve which of the following step/s?
12. Assessment of Resources Availability
13. Reconnaissance Survey
14. Water auditing
15. Quality Assurance
16. Which of the following step is not involved in tertiary treatment of wastewater?
17. removal of suspended biological matter
18. removal of excess nutrients such as nitrogen and phosphorus
19. removal of recalcitrant organic compounds
20. removal of dissolved solids
21. Which of the following is/are not the purpose/s of aeration in water treatment?
22. to reduce the concentration of taste and odor causing substances
23. to oxidize iron and manganese, rendering them insoluble
24. dissolve a gas in the water.
25. to remove dissolved and suspended particles

**P.T.O**

1. Which of the following is not a coagulant chemical used in water treatment?
2. alum (c) sodium aluminate
3. ferric sulphate (d) ferric hydroxide
4. Which of the following statements is not true?
5. Constructions for Atomic Energy Plants and Defense requirements is permitted in CRZ-I
6. 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.
7. Development of facilities required for disposal of treated effluents is permitted in CRZ-I
8. Development of port related waterfront activities is permitted in CRZ-I
9. What is BOD?
10. biological oxygen depletion
11. biological oxygen demand
12. bio-ecological oxygen deprivation
13. biological oxidation demand
14. Vermicomposting is
15. natural organic manure produced from the excreta of earthworms fed on organic waste.
16. natural organic manure produced from dead earthworms in organic waste.
17. synthetic fertilizers produced in laboratories from earthworms.
18. none of these
19. State **True** or **Fase: 1x6=6**
20. The Urban Heat Island Effect (UHI) is a phenomenon whereby the air over the rural areas results is slightly warmer compared to surrounding urban areas.
21. Increased urban water demand generates pressure on existing infrastructure and the problem is more severe in developing countries.
22. Solid waste management also includes agricultural waste.
23. In the osmosis process, demineralization water is produced by forcing water through semi permeable membranes at high pressure.

**P.T.O**

1. Agricultural runoff is an example of point source of pollution.
2. Continuous sources introduce contaminants to the streams for extended periods of time.
3. Difference three differences each between the following: **3x3=9**
4. point and non-point source of water pollution.
5. osmosis and reverse osmosis
6. grey water and black water
7. Explain the problem of urban flood and give some counter measures. **10+5=15**
8. What is rainwater harvesting? What are the advantages and benefits of rainwater harvesting? **5+5=10**
9. Describe the role of soil type in rainwater infiltration rate. What types of soil allows the greatest amount of rainfall to soak in?

**8+2=10**

1. Explain the changes in water resources and water use due to global warming. **10**

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