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**GANDHI INSTITUTE OF ENGINEERING AND TECHNOLOGY UNIVERSITY, ODISHA, GUNUPUR
(GIET UNIVERSITY)**



Ph.D. (Second Semester-Summer) Examinations, May - 2025
23SPPECY2016 - Water Pollution and Treatment Techniques
(Chemistry)

Time: 3 hrs

Maximum: 70 Marks

The figures in the right hand margin indicate marks.

Answer ANY FIVE Questions.**(14 x 5 = 70 Marks) Marks**

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| 1.a. | What are the different types of water pollution? | 7 |
| b. | Explain the adverse effect of water parameters on aquatic organisms? | 7 |
| 2.a | What are the physical pollutants? Explain its impact on human health? | 7 |
| b. | What is hardness? How hardness of water can be calculated by EDTA method | 7 |
| 3.a. | Discussion on different water quality parameters such as pH, DO, conductivity, TS, TDS, Total hardness, Total alkalinity. | 7 |
| b. | Define DO, BOD, COD and TOC in detail. What is the relation between NBOD and CBOD? | 7 |
| 4.a | Explain about the activated sludge treatment of waste water with neat diagram. Write its advantages and disadvantages. | 7 |
| b | Explain the following | 7 |
| | a) Reverse Osmosis | |
| | b) Ozonisation | |
| | c) UV treatment | |
| 5.a. | Explain in detail municipal waste water treatment. | 7 |
| b. | Explain the following | 7 |
| | d) Carbon Adsorption | |
| | e) Membrane Processes | |
| 6.a. | What are the sources of wastewater? Explain the wastewater composition? | 7 |
| b. | Explain the process of removal of suspended solids, dissolved solids? | 7 |
| 7.a. | What is chemical oxidation- recovery of materials from process effluents? | 7 |
| b. | What are the standards related to industrial wastewater. | 7 |
| 8.a. | Discuss the sources and characteristics of industrial wastewater. | 7 |
| b. | Explain the Primary, Secondary and Tertiary treatment of industrial wastewater. | 7 |

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