

Roll No. _____

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B.Sc. Hons Chemistry (FYUP), I Semester
Odd Semester Examination 2024

Paper Name: Water Treatment and Management

Paper Code: BCH-SEC01

Time: 2 hours

Maximum Marks: 45

Note: Write your roll number at the top of the question paper. This paper has 3 sections A, B, and C, Attempt all the three sections

Section A: Answer all the questions; Section B: Answer any 2 out of 4; Section C: Answer all the questions, each question has an internal choice.

Abbreviations Used CLO- Course Outcome, PLO- Program Outcome, BTL- Bloom Taxonomy Level: BT level 1-Remember; BT level 2-Understand; BT level 3-Apply; BT level 4-Analyse; BT level 5-Evaluate, BT level 6-Create

Q.No	Question	Marks	BTL	CLO	PLO
<u>SECTION-A</u>					
Very Short type Questions: Attempt all		(1 x 10 = 10 marks)			
1	Name three types of environmental pollution and provide a brief description of one.	1	1	1-2	2
2	Expand the following acronyms: a) BOD; b) COD	1	1,2	1-2	1
3	Arrange the following water in order of decreasing BOD: a) rain water; b) pond water; c) River water; d) Hot Spring	1	3	3-4	4
4	Define Chelating Agents. Give one example	1	2-3	2-3	3
5	Define AMOEBA plot.	1	3-4	2-3	3
6	Give two major elements associated with E-waste	1	2	2	2
7	A water sample has an initial dissolved oxygen (DO) concentration of 8 mg/L. After incubating the sample in the dark at 20°C for 5 days, the final DO concentration is measured to be 2 mg/L. Calculate the Biochemical Oxygen Demand (BOD) of the water sample.	1	4-5	3-4	5
8	Calculate the Total Dissolved Solids (TDS) in a water sample with following ion concentrations: Sodium (50 mg/L); Calcium (30 mg/L), Chloride (40 mg/L); bicarbonate (20 mg/L)	1	4-5	4	5
9	Define Hardness of water. Method for the determination of hardness of water.	1	3	4	3-4
10	Define saponification value. Give its use in water treatment.	1	3	4	3-4
<u>SECTION B</u>					
Long Type Questions (Attempt any two out of four):		(10x2=20 marks)			
B1	Explain Softening of water using a) Ion Exchange process and b) Chelating agents	10	4-5	4-5	4-5

B2	How Coagulation and Flocculation are performed in water. Give one example of chemical agents for performing coagulation and flocculation	10	4-5	5	4-5
B3	What are the titration techniques can be employed in the estimation of pollution in water?	10	5-6	3	3-4
B4	Explain potability of water and Chemical substances affecting potability.	10	5-6	2-3	3

SECTION C

Short Type Questions (Attempt all Questions):		(3x5=15 marks)			
C1	(a) What does Biochemical Oxygen Demand (BOD) measure in water, and why is it considered an essential parameter in assessing water quality	3	3-5	3	3
	Or				
	(b) Flame based analysis could be used for the detection of cation in water, support this comment with two suitable examples	3	3-5	2	2
C2	(a) Differentiate between the Osmosis and reverse Osmosis.	3	2-4	3-4	3-4
	Or				
	(b) What are colligative properties?	3			
C3	Give methods for the determination of:	3	1-4	3-4	3
	a) As and Hg.				
	Or				
	b) Fe and Cu	3		3	3
C4	(a) Explain distribution of water on Earth with the help of diagram.	3	3-4	2-3	4
	Or				
	(b) What is the effect of the following ions on quality of water: i) Sulphide, ii) Co and iii) Nitrate	3	5-6	4	
C5	(a) Explain reason for the following a) Acid rain; b) Minamata disease	3	1-3	4	4
	Or				
	(b) If in a given sample of water on treating with BaCl ₂ , a total 2.33gm of precipitate was obtained. What does this signify and evaluate the numerical importance of obtained result	3	4-6	4	4