



Model Question Bank 2018-19

Program: B.E.

Course: Engineering Chemistry

Semester: I/II

Course Code: 18CH1ICCHY/18CH2ICCHY

UNIT-V WATER TREATMENT AND NANO MATERIALS

Q. No	Question Description	Marks	BL	COs
1.	i. Identify the purest form of natural water.	1	1	CO1
	ii. Identify the reasons for hardness in water.	1	1	CO2
	iii. Identify the reasons for permanent hardness in water.	1	1	CO1
	iv. Name the reasons for temporary hardness in water.	1	1	CO1
	v. Define nanometer.	1	1	CO2
	vi. List the disadvantage of scales.	1	1	CO2
	vii. Identify the technique to detect the size of nanomaterials.	1	1	CO1
	viii. Identify the technique to detect the surface properties of nanomaterials.	1	1	CO2
	ix. List the information given by XRD	1	2	CO2
	x. Identify a method to desalinate sea water.	1	1	CO2
	xi. List the information given by TEM.	1	2	CO1
	xii. List the information given by SEM.	1	2	CO2
	xiii. List nanomaterials for LEDs.	1	1	CO2,
	xiv. List nanomaterials for sensors.	1	1	CO2
	xv. List nanomaterials for nanomedicine.	1	1	CO2
	xvi. List nanomaterials for water purification.	1	1	CO4
	xvii. Define reverse osmosis.	1	1	CO1
	xviii. List any two methods of desalination.	1	1	CO1
	xx. List one disadvantage of sludges.	1	1	CO1
2	Define boiler sludges and scales. Describe their formation.	6	2	CO1
3	Analyse the disadvantages of sludges and scales in boilers.	4	4	CO5

4	Define boiler corrosion. Elaborate on the mechanism of boiler corrosion due to dissolved oxygen, carbon dioxide and magnesium chloride.	8	5	CO1
5	Explain the determination of dissolved oxygen by Winkler's method.	6	2	CO2
6	Define chemical oxygen demand. Describe its determination.	6	1	CO2
7	20 ml of sewage sample is reacted with 25 ml of $K_2Cr_2O_7$ solution and the unreacted $K_2Cr_2O_7$ requires 9 ml of 0.25 N FAS solution. Under similar conditions, in blank titration 15 ml of FAS is used up. Solve for the COD of the sample.	6	3	CO4
8	50 ml of an industrial effluent is allowed to react with 100 ml of $K_2Cr_2O_7$ solution. The unreacted $K_2Cr_2O_7$ consumed 25 ml of 0.05 N FAS solution. In blank titration, 35 ml of same FAS is consumed. Solve for the COD of the effluent.	6	3	CO4
9	In a COD experiment, 20 ml of waste water sample consumes 30 ml of 0.01 M $K_2Cr_2O_7$ for oxidation of impurities. Solve for the COD value of water sample. [MW of $K_2Cr_2O_7$ = 294]	6	3	CO4
10	Solve for the COD of the effluent sample when 25 ml of the effluent requires 10.5 ml of 0.005 M $K_2Cr_2O_7$ for complete oxidation.	6	3	CO4
11	Explain the different methods of sewage treatment.	6	2	CO1
12	Explain the activated sludge process of sewage treatment.	4	2	CO2
13	Explain tertiary treatment method of sewage water.	4	1	CO2
14	Describe the ion exchange method of softening of water.	4	1	CO1
15	Define desalination. Describe reverse osmosis and eletrodialysis methods.	8	1	CO6
16	Define nanomaterials. Explain their size dependent properties.	8	2	CO1
17	Describe the synthesis of nanomaterials by sol-gel method and mention its advantages.	6	1	CO2
18	Describe the synthesis of nanomaterials by solution combustion method.	6	1	CO2
19	Elaborate on the following along with their applications: (a) fullerenes (b) carbon nanotubes.	6	5	CO2
20	Formulate the characterization of nanomaterials using TEM, SEM and XRD.	4	1	CO1
21	Analyze application of nanomaterials in water purification.	4	4	CO6
22	Elaborate on nanomaterials used as LEDs and sensors.	6	5	CO6
23	Evaluate the use of nanomaterials in medicine.	4	6	CO6

