PRN No. 018	Total No. of Questions:

JSPM's
Rajarshi Shahu College of Engineering, Tathawade, Pune- 411033
(An autonomous institute affiliated to Savitribai Phule Pune University)
Examination: Mid Semester (MSE)
Semester: II
Academic Year: 2024-25
Program: Civil, Electrical, Electronics and Telecommunication, Computer Engineering.
Examination Class: F. Y. B. Tech.

Course Code: ES1207T **Course Name and Pattern: Chemistry for Engineers (2023R)**

Duration: 1 Hour **Max. Marks: 30 Marks**

Instructions to the Candidates
1. Solve section All three sections A, B, C
2. Choose and answer **one** option from each question.
3. Assume suitable and necessary data wherever required.

Section A

Q. No.	Question	Bloom's Level	Marks	COs
1	Define the following terms i) Reverse Osmosis, ii) Electroluminescent Polymer iii) Cell Constant	BL1	3	CO1
	OR			
1	State any three properties of Polycarbonate	BL1	3	CO1
2	Define the following terms i) Conductance, ii) Biodegradable Polymers. and iii) Priming	BL1	3	CO1
	OR			
2	State types of nanomaterials based on dimensions with suitable examples.	BL1	3	CO1
3	Describe the construction and cell representation of the calomel electrode with a neat labeled diagram	BL2	3	CO2
	OR			
3	Explain the process of conductometric titration between strong acid and strong base with reaction and titration curve.	BL2	3	CO2
4	Discuss factors affecting the biodegradation of polymers.	BL2	3	CO2
	OR			
4	Explain factors causing boiler corrosion.	BL2	3	CO2

Section B

Q. No.	Question	Bloom's Level	Marks	COs
5	Explain the zeolite process for water softening, outlining the chemical reactions involved, and provide an appropriate diagram.	BL2	5	CO2
	OR			
5	Discuss types of carbon nanotubes with suitable examples.	BL2	5	CO2
6	Describe the procedure for determining the acid concentration in a sample using a p^H meter.	BL3	5	CO3
	OR			
6	Distinguish between scale and sludge formation in boilers.	BL3	5	CO3

Section C

Q. No.	Question	Bloom's Level	Marks	COs
7	a) A water sample of 100 ml requires 12 ml of 0.01M EDTA in titration.100 ml of the same water sample when titrated after boiling and filtration, requires 6ml of EDTA. Calculate the carbonate and non-carbonate hardness of water. b) Identify which electrode is used in the application given below. i) Presence of H^+ ions in the sample ii) Presence of F^- ions in the sample iii)Presence of NH_3 in urea sample iv) Presence of oxygen gas in the sample.	BL3	4 4	CO3
	OR			
7	a)Identify the specialty polymer used in the application given below i) Sport, goods, musical instruments, etc. ii) Used for controlled drug delivery iii) Information Display iv) Bullet Proof Glass b) An alkaline water sample of 100 ml requires 10 ml of N/50 HCl up to the phenolphthalein endpoint and further it requires 10 ml of the same acid for complete neutralization. Find the type and amount of alkalinity in the water sample	BL3 BL3	4 4	CO3