

Extra

K. J. Somaiya Institute of Technology, Sion, Mumbai-22
(Autonomous College Affiliated to University of Mumbai)

April 2026 ~~Nov-Dec 2025~~

~~Supplementary~~ Regular Examination: FY Semester: I

Course, Code: BSC103 and Course Name: Engineering Chemistry

Date of Exam: ~~16/01/26~~

Duration: 02 Hours

Max. Marks: 45

10/04/26

Instructions:

- (1) All questions are compulsory.
- (2) Draw neat diagrams wherever applicable.
- (3) Assume suitable data, if necessary.

Additional Data Atomic weights: C = 12, H = 1, N = 14, O = 16, Cl = 35.5, Na = 23, Mg = 24, Ca = 40
S = 32, Cl = 35.5

		Max. Marks	CO	BT level
Q 1	Solve any five questions out of six.	15		
i)	A water sample on analysis has been found to contain following impurities in ppm: Mg(HCO ₃) ₂ = 14.6, Mg(NO ₃) ₂ = 29.6, Ca(HCO ₃) ₂ = 8.1, MgCl ₂ = 19, MgSO ₄ = 24. Calculate the temporary and permanent hardness of water sample.	3	2	2
ii)	“Prevention of waste” is an important principle of green chemistry, Explain.	3	5	2
iii)	Mention any three constituents of paint and give their functions.	3	1	2
iv)	Explain briefly the method of generating biogas.	3	4	1
v)	What are the limitations of flame photometry?	3	6	1
vi)	3g of coal was heated in Kjeldahl’s flask and NH ₃ evolved was absorbed in 40 ml of 0.5N H ₂ SO ₄ . After absorption the excess acid required 18.5 ml of 0.5N KOH for neutralization. Calculate the % of N in the sample.	3	3	2
Q.2	Solve any three questions out of four.	15		

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B. Tech Program Scheme- III

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i)	What is cathodic protection? Explain sacrificial anode method.	5	1	2
ii)	0.28g of CaCO ₃ was dissolved in HCl and the solution made up to 1 liter with distilled water. 100 ml of the above solution required 28 ml of EDTA solution. 100ml of unknown hard water sample required 33 ml of EDTA solution. After boiling of this water, cooling and filtering, 100ml of this solution on titrations required 10ml of EDTA solution. Calculate each type of hardness of water.	5	2	3
iii)	Write an informative note on atomic and molecular spectroscopy.	5	6	2
iv)	What is meant by 'knocking' in internal combustion engine? Define octane number and cetane number. Name any two antiknock agents.	5	3	2
Q.3	Solve any three questions out of four.	15		
i)	Giving conventional and green chemistry route of production of adipic acid, highlight the green chemistry principles addressed in this case	5	4	3
ii)	Write a descriptive note on Ion Exchange method.	5	2	2
iii)	Explain mechanism of galvanic corrosion.	5	1	2
iv)	Calculate weight and volume of air needed for complete combustion of 1m ³ of gaseous fuel which possess by volume CH ₄ = 35%, C ₂ H ₄ = 5%, CO = 15%, H ₂ = 40%, N ₂ = 1%, Water vapour = 4% (Mol. Wt. of Air = 28.94)	5	3	3