

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Supplementary Winter Examination – 2025

Course: F. Y. B. Tech

Semester: I

Branch : All Branches (UD and AF)

Subject Code & Name: Engineering Chemistry (BTBS102)

Max Marks: 60

Date: 17/01/2026

Duration: 3 Hr.

Instructions to the Students:

1. Each question carries 12 marks.
2. Question No. 1 will be compulsory and include objective-type questions.
3. Candidates are required to attempt any four questions from Question No. 2 to Question No. 6.
4. The level of question/expected answer as per OBE or the Course Outcome (CO) on which the question is based is mentioned in () in front of the question.
5. Use of non-programmable scientific calculators is allowed.
6. Assume suitable data wherever necessary and mention it clear.

		(CO)	Marks
Q. 1	Objective type questions. (Compulsory Question)		12
1	The residual hardness for ion exchange process is _____.	03	1
	a. 17 ppm b. 5-7 ppm c. 2 ppm d. 15-30 ppm		
2	For regeneration of cation exchange resin _____ solution is used.	03	1
	a. HCl b. NaOH c. KCl d. NaCl		
3	The permanent hardness of water cannot be removed by _____.	03	1
	a. Chlorination b. Calcination c. Cooling d. Boiling		
4	If only one Phase is present in one component system then the degree of freedom is _____.	04	1
	a. 0 b. 1 c. 2 d. 3		
5	_____ is an independent variable that defines composition of all phases.	04	1
	a. Component b. Phase c. Degrees of freedom d. none of these		
6	In water system, the curve which represents equilibrium between Solid, liquid & Vapors is called _____.	04	1
	a. vaporization curve b. sublimation curve c. melting point curve d. triple point		
7	Corrosion occurred by oxygen is known as _____ corrosion.	02	1
	a. electrochemical b. wet c. oxidation d. microbial		
8	Pitting corrosion occurs due to the formation of _____.	02	1
	a. bit b. coating c. sheet d. pit		
9	_____ is known as brown coal.	05	1

	a. Peat	b. Lignite	c. Anthracite	d. Coke		
10	The Kjedahl method is used for estimation of _____.				05	1
	a. Carbon	b. Nitrogen	c. Sulphur	d. Oxygen		
11	Methyl orange is used in pH _____ range.				01	1
	a. 6.5 – 8pH	b. 3.2 - 4.5pH	c. 14 – 17pH	d. 7- 8pH		
12	The H ₂ -O ₂ fuel cell is used to produce _____.				01	1
	a. electricity	b. water	c. methane	d. LPG		
Q. 2	Solve the following.					12
A)	Explain the ion exchange process of softening of water.				03	6
B)	Discuss in brief determination of Hardness by EDTA method.				03	6
Q.3	Solve the following.					12
A)	Explain condensed phase rule with example.				04	6
B)	Describe in detail one component phase diagram of Water system.				04	6
Q. 4	Solve Any Two of the following.					12
A)	Explain in detail wet corrosion.				02	6
B)	Discuss oxygen absorption mechanism of corrosion.				02	6
C)	Write a note on Sacrificial Anodic Protection.				02	6
Q.5	Solve Any Two of the following.					12
A)	Discuss in brief physical and chemical properties of lubricants.				05	6
B)	Explain in detail types of coal.				05	6
C)	Define term fuel. Write a note classification of fuel.				05	6
Q. 6	Solve Any Two of the following.					12
A)	Explain the construction and working of glass electrode.				01	6
B)	Write a note on Hydrogen – Oxygen (H ₂ -O ₂) Fuel Cell.				01	6
C)	Discuss the method for measurement of conductance.				01	6
*** End ***						