Rayat Shikshan Sanstha's

Karmaveer Bhaurao Patil College of Engineering, Satara

Academic Year:2025-26 **Semester-I**

Name of the Program:- F. Y. BTech **Name of the Course: Engineering Chemistry**

Course Code: [24AF1CHEBS102] **Course Coordinator:Mrs.Yogita Babar**

Basic Sciences & Humanities Department

Innovative Teaching - Learning Activities Planning

Objectives :-

- It provides rich and varied experiences to the students, thereby building their knowledge, boosting creativity skills and increasing cognitive skills.
- Improve students' confidence, using their resources, and self-directed work.
- Improve students' interest in subjects, learning satisfaction.

Outcomes :-Student will be able to learn critical thinking skills.

Student will be able to improve learning and retention of information

Sr. No.	Name of Activity	Unit	Planned Date	Actual Date	Platform	No.of students completed
1.	Problem & Solution Engg Sketch	Unit 1	17/09/2025	17/09/2025	Offline	120
2.	Crossword Puzzle	Unit 1,Unit 2	25/09/2025		Offline in class & Online on Google Classroom	120
3.	Word Search Puzzle	Unit 1 ,Unit 3	3/10/2025	6/10/2025	Offline in class & Online on Google Classroom	120
4	Kahoot Quiz	Unit1,Unit 2, 3, Unit4	14/10/2025	14/10/2025	Online	120
5.	Mindmapping	Unit 4 & Unit 5	16/12/25	16/12/25	Offline	120
6.	One Minute Paper	Unit 1,Unit 5	22/12/25	22/12/25	Offline	120
7	Google form Quiz	Unit 2, 3, Unit4	24/12/25	24/12/25	Online	120

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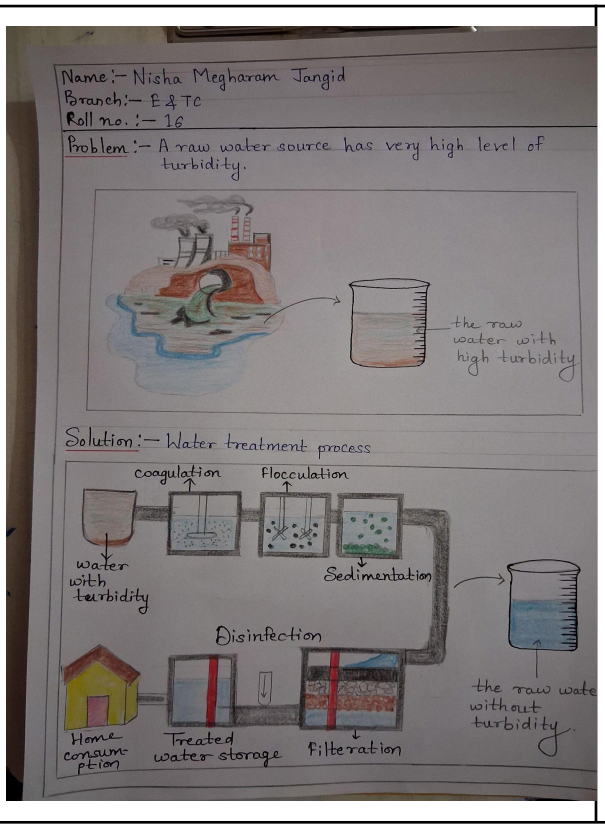
Innovative Activity Details :-

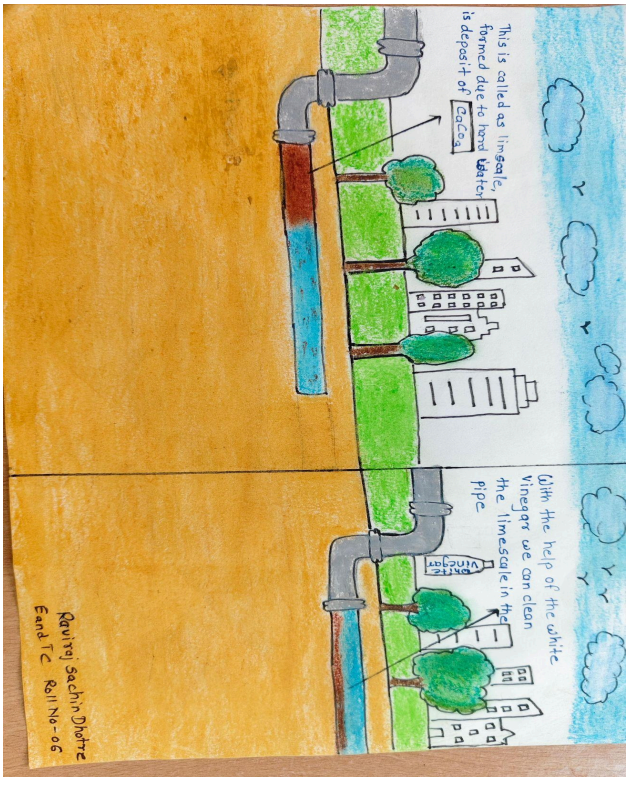
1.Problem & Solution Engg Sketch

In Satara city, a major problem was observed due to clogging of pipelines caused by the formation of limescale deposits. During the rainy season, water turbidity further increased, making the supply unsafe and unfit for daily use. The clogged pipelines reduced water flow and created inconvenience for the residents. Engineers investigated the issue and found that hardness-causing minerals were the main reason behind the scaling problem. To overcome this, a water softening unit was proposed near the water supply station. Along with this, lime-soda treatment and EDTA methods were suggested to reduce hardness. For turbidity, sedimentation tanks and filtration units were installed to remove suspended impurities. Regular cleaning and flushing of pipelines were also planned as preventive measures.

Students can sketch the problem as clogged, narrow pipelines with deposits + muddy water in rainy season, and solution sketch as a treatment plant with softening & filtration units before clean water enters pipelines.

Activity Photos





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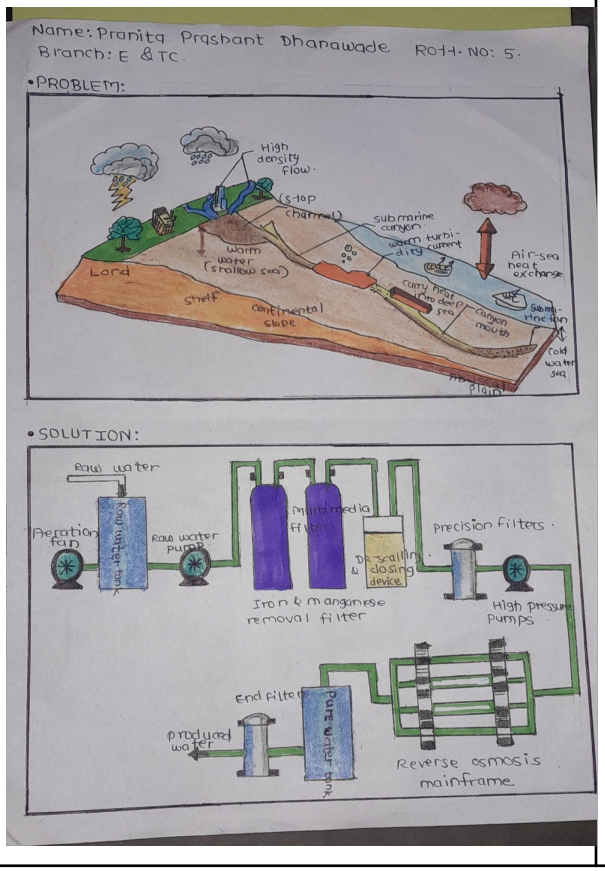

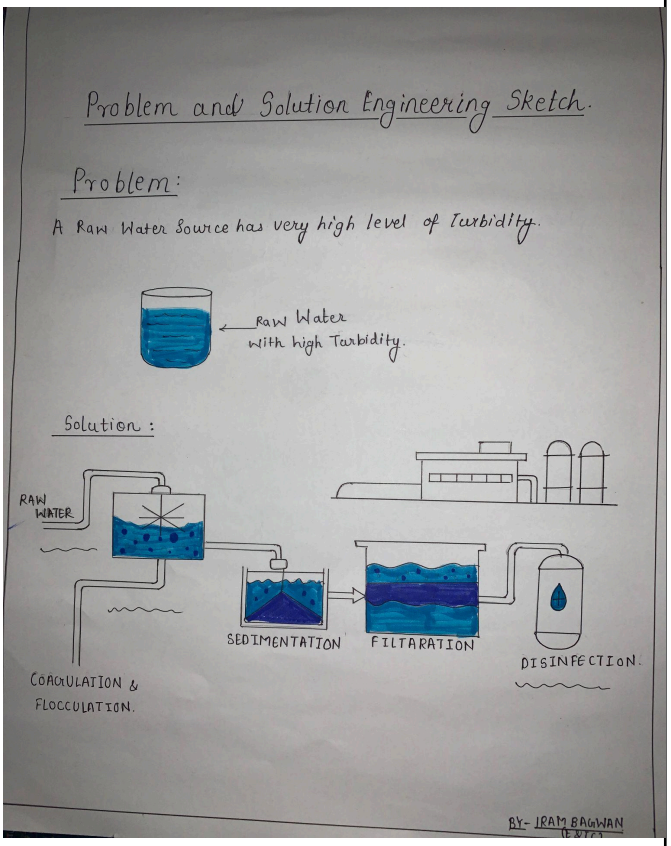

2.Extra Lab Activity

Introduction

Water hardness is primarily caused by the presence of dissolved minerals, particularly calcium (Ca^{2+}) and magnesium (Mg^{2+}) ions. Hard water can affect soap efficiency, scale formation in pipes, and even biological systems. This experiment aimed to determine the hardness of different water samples using titration with a standard solution of EDTA (ethylenediaminetetraacetic acid), which is complex with calcium and magnesium ions.

Objectives

1. To determine the hardness of water samples from various sources.
2. To understand the principles of complexometric titration.
3. To analyze the effect of hardness on everyday water use.

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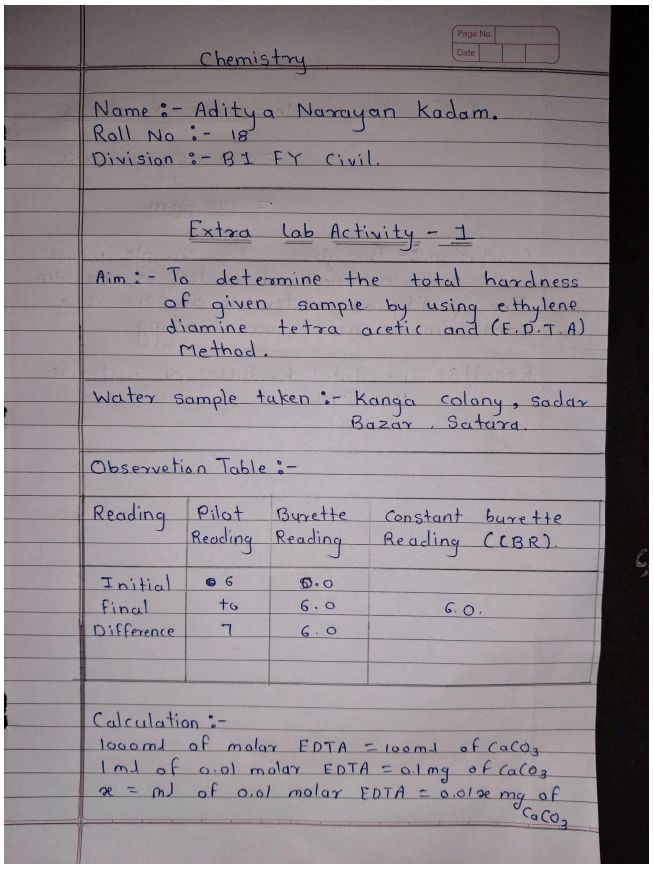
Data Collection- Sample collection,Readings

Conclusion

The experiment successfully demonstrated the determination of water hardness using EDTA titration. The results highlighted significant differences in hardness among the samples tested, illustrating the impact of source and mineral content on water quality.
Students collected water samples from different areas and hardness calculated

Extra lab activity report



Chemistry

Name :- Aditya Narayan Kadam.
Roll No :- 18
Division :- B1 FY Civil.

Extra lab Activity - 1

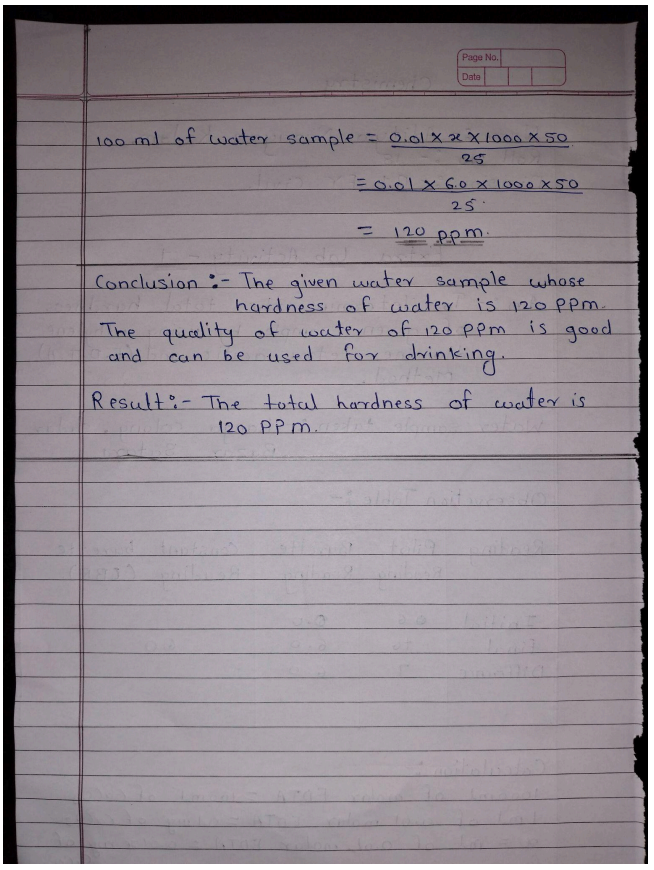
Aim :- To determine the total hardness of given sample by using ethylene diamine tetra acetic and (E.D.T.A) Method.

Water sample taken :- Kanga colony, sadar Bazar, Satara.

Observetion Table :-

Reading	Pilot Reading	Burette Reading	Constant burette Reading (CBR)
Initial	6	0.0	
Final	to	6.0	6.0.
Difference	7	6.0	

Calculation :-
1000ml of molar EDTA = 100ml of $CaCO_3$
1 ml of 0.01 molar EDTA = 0.1 mg of $CaCO_3$
x = ml of 0.01 molar EDTA = 0.01x mg of $CaCO_3$



100 ml of water sample = $\frac{0.01 \times x \times 1000 \times 50}{25}$

$= \frac{0.01 \times 6.0 \times 1000 \times 50}{25}$

= 120 ppm.

Conclusion :- The given water sample whose hardness of water is 120 PPm. The quality of water of 120 ppm is good and can be used for drinking.

Result :- The total hardness of water is 120 PPm.

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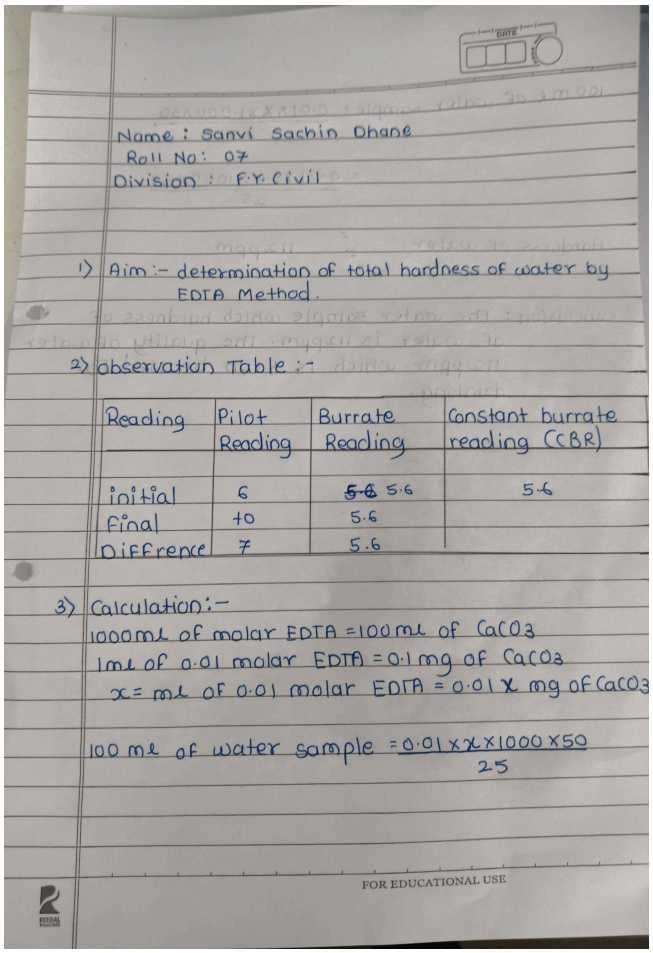


Name : Sanvi Sachin Dhane
Roll No: 07
Division : F.Y. Civil

1) Aim :- determination of total hardness of water by EDTA Method.

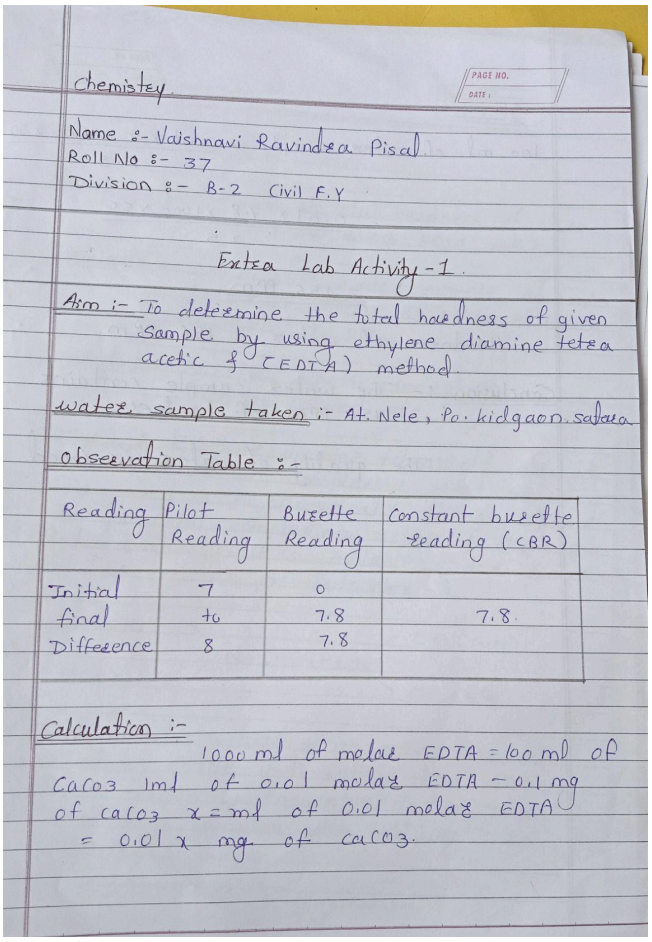
2) observation Table :-

Reading	Pilot Reading	Burrate Reading	Constant burrate reading (CBR)
initial	6	~~5.6~~ 5.6	5.6
final	to	5.6	
Diffrence	7	5.6	

3) Calculation:-
1000ml of molar EDTA = 100 ml of CaCO3
1ml of 0.01 molar EDTA = 0.1 mg of CaCO3
x = ml of 0.01 molar EDTA = 0.01 x mg of CaCO3

100 ml of water sample = $\frac{0.01 \times x \times 1000 \times 50}{25}$

FOR EDUCATIONAL USE



Chemistry

Name :- Vaishnavi Ravindra Pisal
Roll No :- 37
Division :- B-2 Civil F.Y

Extra Lab Activity - 1.

Aim :- To determine the total haedness of given sample by using ethylene diamine tetra acetic (EDTA) method.

water sample taken :- At. Nele, Po. kidgaon. satara

Observation Table :-

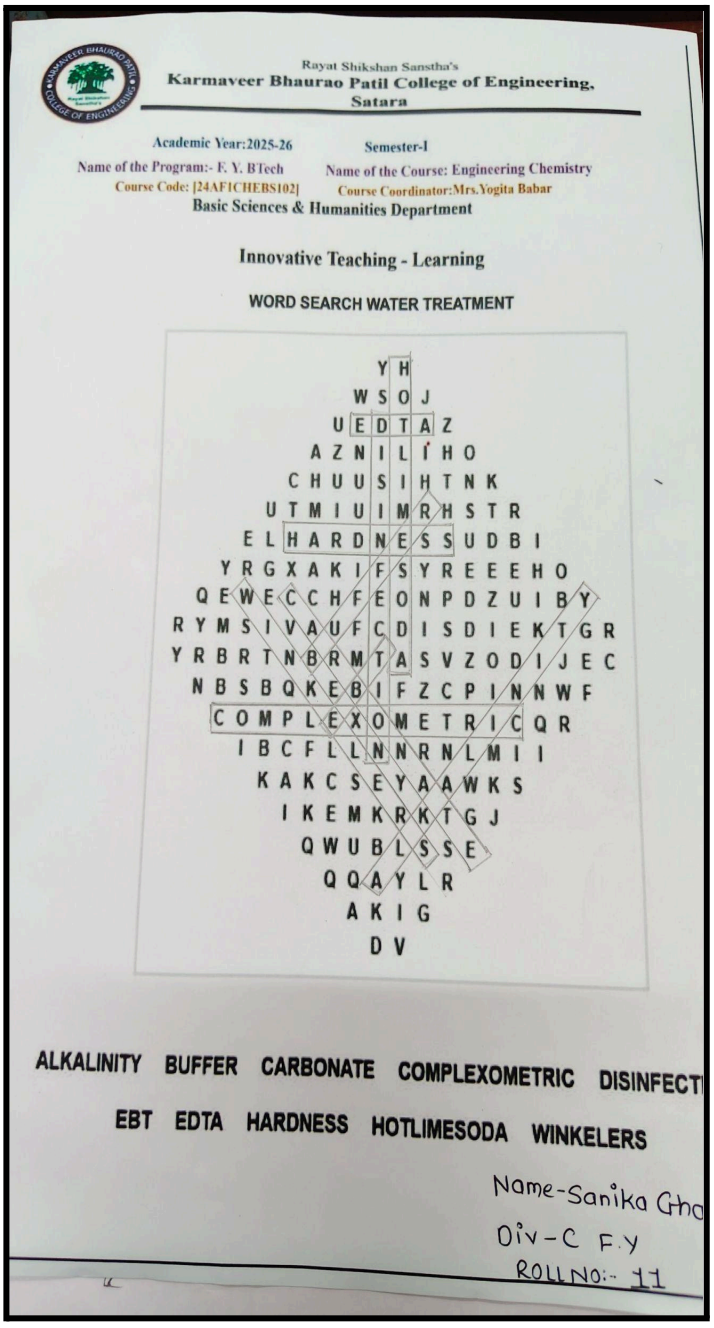
Reading	Pilot Reading	Burette Reading	Constant burette reading (CBR)
Initial	7	0	
final	to	7.8	7.8
Difference	8	7.8	

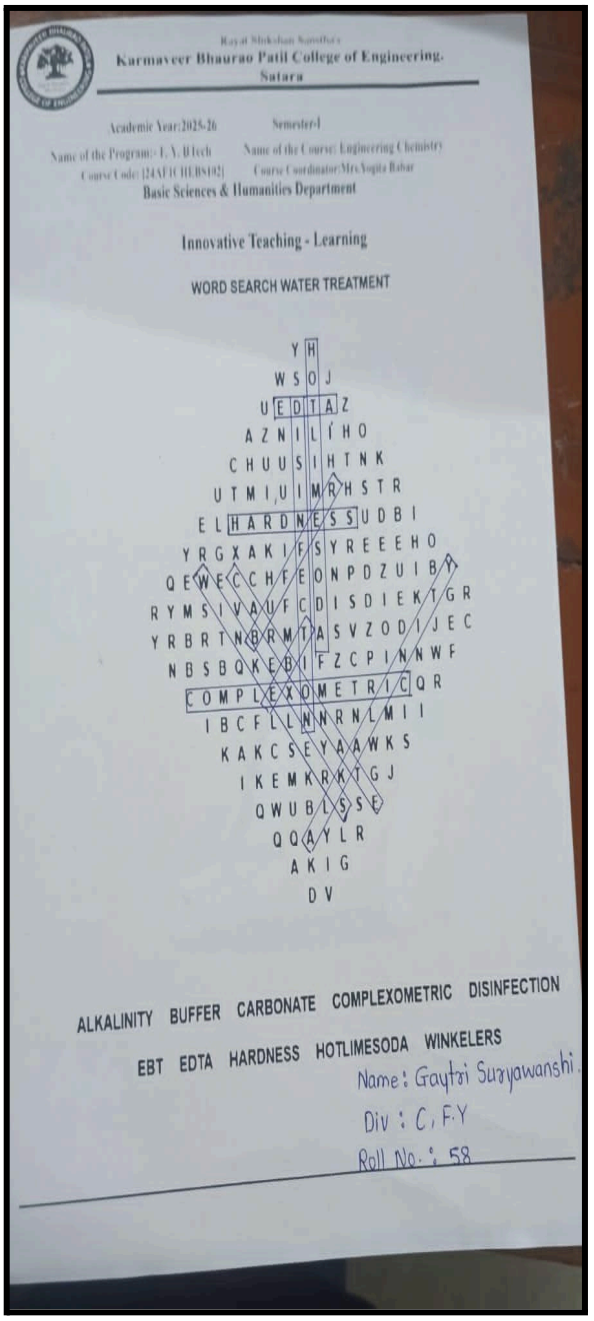
Calculation :-
1000 ml of molar EDTA = 100 ml of CaCO3 1ml of 0.01 molar EDTA = 0.1 mg of CaCO3 x = ml of 0.01 molar EDTA = 0.01 x mg of CaCO3.

3.Word Search Puzzle on Water Treatment"

An innovative classroom activity titled "Word Search Puzzle on Water Treatment" was conducted to make learning more interactive and enjoyable. The main objective of this activity was to enhance students' understanding of key terms and processes involved in water treatment such as coagulation, sedimentation, filtration, chlorination, aeration, hardness, turbidity, alkalinity, and disinfection through a fun and engaging method. Students were provided with printed puzzle sheets containing hidden scientific terms, which they had to locate within a limited time. This activity encouraged active participation, improved vocabulary, and reinforced conceptual clarity in a playful environment. It also promoted teamwork, critical thinking, and visual learning while helping students recall and connect important concepts related to water

purification. The teacher guided students throughout the session, explained each term, and discussed its practical relevance. Overall, the word search puzzle proved to be an effective and innovative learning tool, making the topic of water treatment more interesting, memorable, and enjoyable for all participants.





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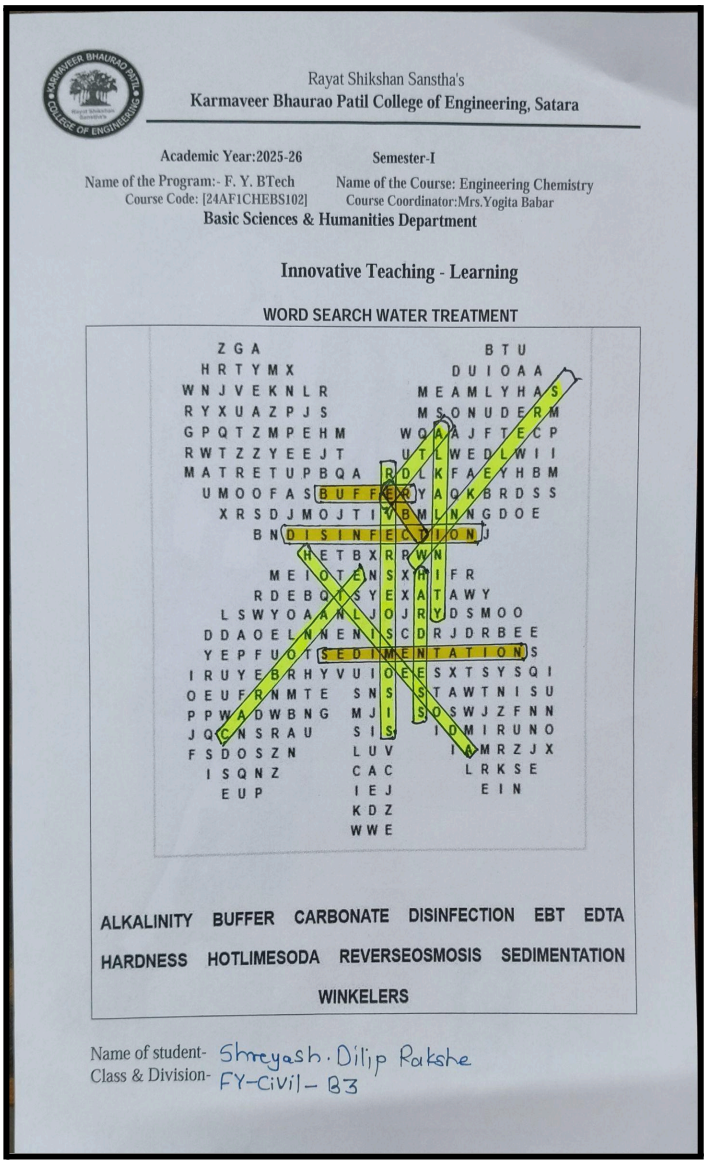

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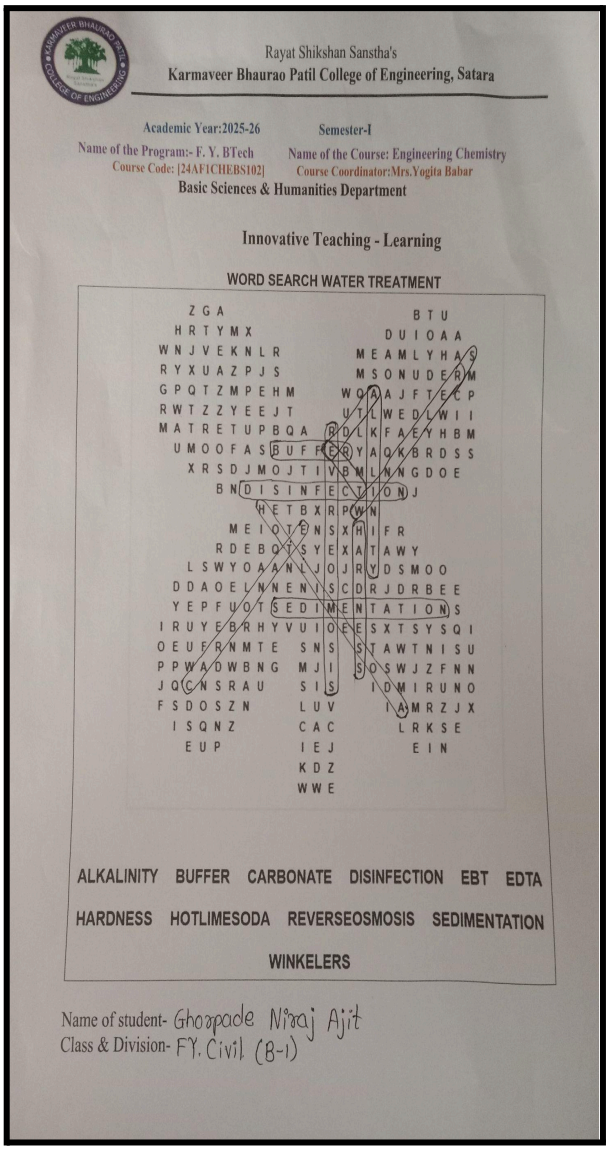
Innovative Teaching - Learning

WORD SEARCH WATER TREATMENT

ALKALINITY BUFFER CARBONATE DISINFECTION EBT EDTA
HARDNESS HOTLIMESODA REVERSEOSMOSIS SEDIMENTATION
WINKELERS

Name of student- Shreyash. Dilip Rakshe
Class & Division- FY-Civil- B3



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Innovative Teaching - Learning

WORD SEARCH WATER TREATMENT

ALKALINITY BUFFER CARBONATE DISINFECTION EBT EDTA
HARDNESS HOTLIMESODA REVERSEOSMOSIS SEDIMENTATION
WINKELERS

Name of student- Ghorpade Niraj Ajit
Class & Division- FY. Civil (B-1)

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4.Innovative teaching by using kahoot Introduction

Kahoot is an interactive game-based learning platform that promotes engagement and active participation in the classroom. This report details an innovative teaching activity utilizing Kahoot to reinforce learning, assess understanding, and foster a collaborative learning environment.

Objectives

1. Enhance Engagement:
2. Assess Knowledge:
3. Promote Collaboration: Materials Needed:

- Access to Kahoot platform (computer or mobile devices)
- Projector or smartboard for displaying the game
- Internet connection
- Pre-prepared Kahoot quiz based on the subject matter

Procedure

1. Introduction (5 minutes):
    - Introduce the activity and explain how Kahoot works.
    - Highlight the importance of the quiz as a fun way to review and reinforce learned concepts.
2. Quiz Setup (5 minutes):
    - Ensure all students have access to devices (smartphones, tablets, or laptops).
    - Instruct students to go to the Kahoot website or app and enter the game PIN provided.
3. Kahoot Quiz (25 minutes):
    - Launch the quiz and read the questions aloud.
    - Allow students to answer individually while encouraging discussion within teams.
    - Use the timer for each question to maintain excitement and urgency.
    - After each question, display results to the class to facilitate immediate feedback and discussion.
4. Review and Discussion (5 minutes):

- Review the correct answers for each question and discuss any common misconceptions.
- Encourage students to share their thought processes behind their answers to promote peer learning.

Conclusion

Using Kahoot as an educational tool transforms traditional review sessions into interactive, engaging experiences. This activity not only reinforces content knowledge but also enhances critical thinking and collaboration skills among students.

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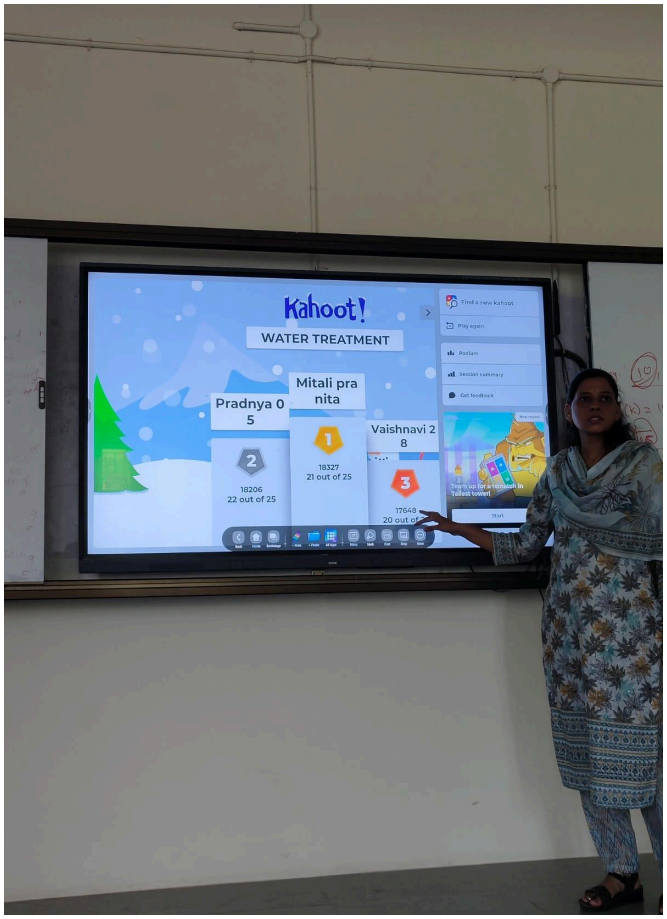
<td> 
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5. Library Activity

A library visit was organized for the students of F.Y. BTech enrolled in the course Engineering Chemistry (Course Code: 24AF 1 CHEBS 202) as part of their academic enrichment activities. The visit was intended to familiarize students with the various resources available in the library, including textbooks, reference books, journals, online resources, and other materials useful for their academic studies.

Date of Visit:16/12/2025

The course coordinator provided a detailed explanation of the library's layout and how the resources are organized. Students were shown the sections for textbooks, reference books, journals, and other academic resources.

Demonstration of Online Resources: The librarian demonstrated how to access online databases and journals available through the library's website. Students were introduced to the digital library platform and were shown how to use it for research purposes.

Guidance on Using Library Catalog: The students were taught how to search for books, articles, and other resources using the library's catalog system. They were shown how to locate books by title, author, or subject.
Exploring Study Areas and Facilities: The students were taken on a tour of the library, where they explored various study areas, including silent reading zones and group study areas, to understand the environment conducive to their academic work.
The library visit proved to be a valuable and informative session for the students of F.Y. BTech. It successfully achieved its objectives of familiarizing students with the library resources and services, as well as enhancing their research and academic skills.

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6.Crossword Puzzle-

Introduction

Crossword puzzles are a versatile educational tool that can enhance learning across various subjects. This
report outlines a teaching activity that incorporates crossword puzzles to promote engagement, reinforce
vocabulary, and develop critical thinking skills among students.

Objectives

1. Reinforce Vocabulary:
2. Encourage Collaboration:
3. Develop Critical Thinking: To challenge students to think creatively and solve problems.

Introduction (10 minutes):

- I had given a brief overview of the subject matter and key vocabulary terms.
- Explained the purpose of the crossword puzzle as a fun way to reinforce their learning.

Group Formation (5 minutes):

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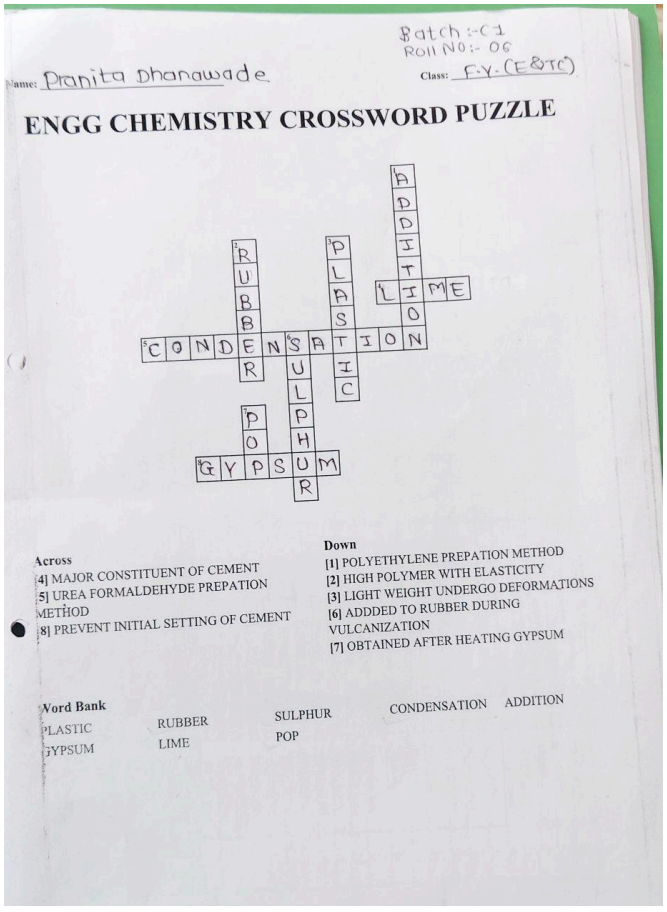
- Divide the class into small groups of 3-4 students to encourage collaboration.
- A mix of abilities within each group to promote peer learning.

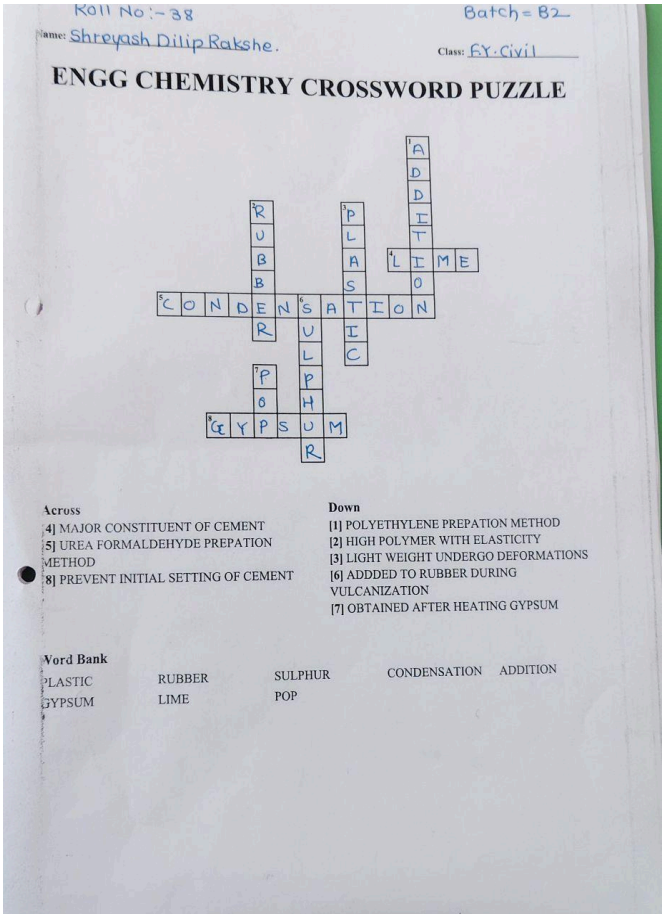
Puzzle Solving (30 minutes):

- Distribute printed copies of the crossword puzzles to each group.
- Set a timer for 20 minutes for the initial attempt.
- Encourage groups to discuss clues and work together to fill in the puzzle.
- After the timer goes off, have groups share their completed puzzles on board.

Conclusion

This activity not only reinforces knowledge but also fosters essential skills such as teamwork and critical thinking.





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7.Mind Mapping / Concept Mapping

Mind Mapping and Concept Mapping are visual tools used to represent information, ideas, or concepts and how they relate to each other. These methods help in organizing thoughts, improving memory, and enhancing learning or brainstorming sessions.

The mind mapping and concept mapping activity was successful in engaging participants and teaching them valuable skills for idea organization and problem solving. These tools can be effectively integrated into education, business planning, and creative work.