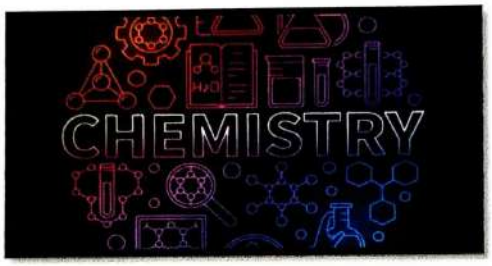
S.A.S. GOVERNMENT DEGREE COLLEGE
NARAYANAPURAM, WEST GODAVARI DISTRICT-534406
(AFFILIATED TO ADIKAVI NANNAYA UNIVERSITY, RAJAMAHENDRAVARAM)
Phone: 08818 252189, E-mail: narayanapuram.jkc@gmail.com

ESTD 1972

SAS GOVT. DEGREE COLLEGE ★ NARAYANAPURAM, W.G.DT. ★

DEPARTMENT OF CHEMISTRY

CERTIFICATE COURSE ON "WATER ANALYSIS"



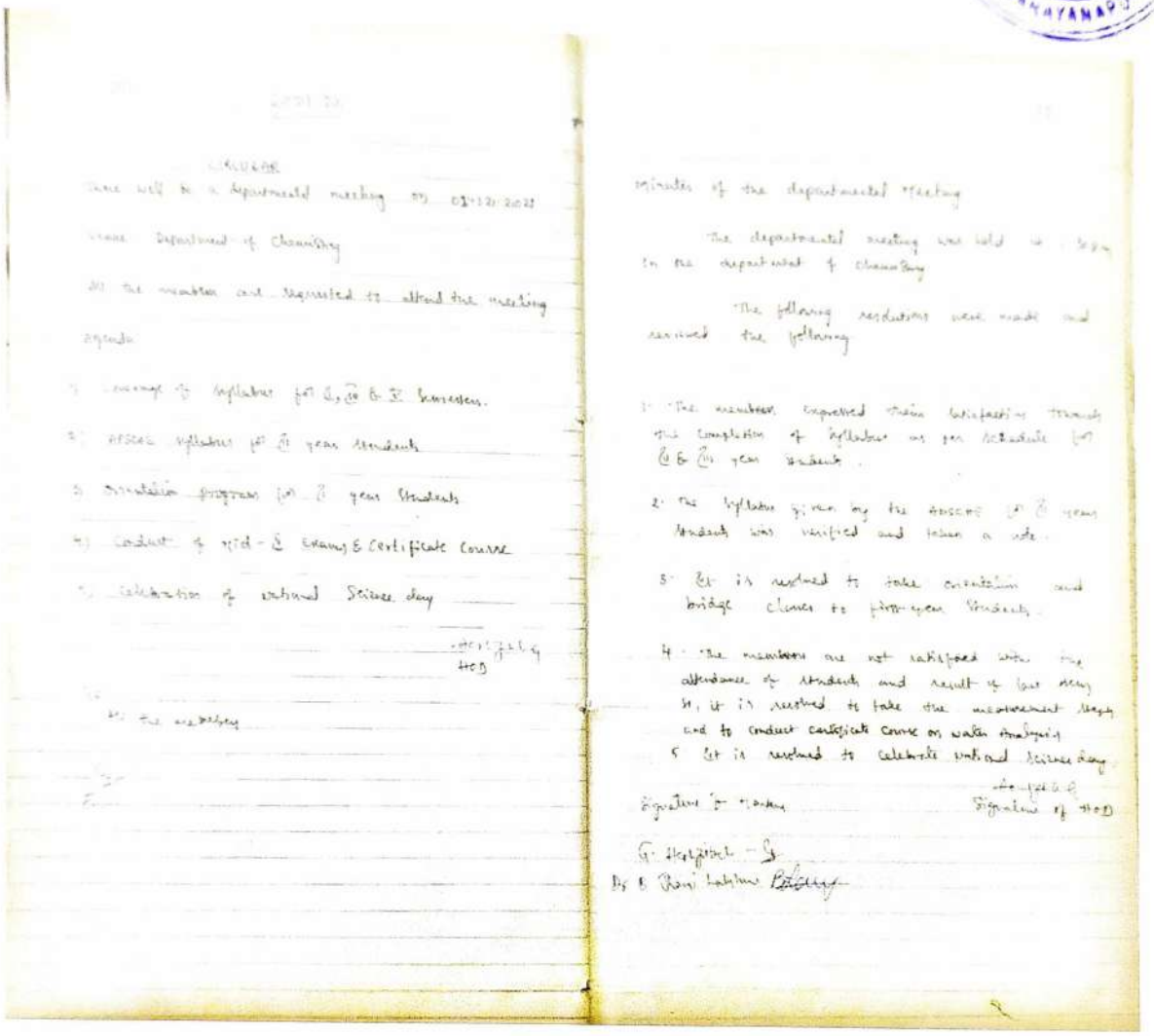
COURSE CO-ORDINATOR

SMT.G.HEPHZIBAH

ACADEMIC YEAR -2021-22

CERTIFICATE COURSE AT A GLANCE

1. TITLE OF THE COURSE: WATER ANALYSIS
2. LEVEL OF THE COURSE: UG
3. NAME OF THE CO-ORDINATOR: G.HEPHZIBAH
4. DURATION OF THE COURSE: 30 HOURS
5. DATE OF COMMENCEMENT : 06.12.2021
6. DATE OF CLOSURE: 10.01.2022
7. TIME OF CONDUCT OF THE CLASSES: 5:00 PM – 6:00 PM
8. NUMBER OF STUDENTS ENROLLED FOR THE COURSE: 15
9. NUMBER OF STUDENTS COMPLETED THE COURSE: 15
10. ASSESMENT CRITERION: EVALUATION TEST



CIRCULAR

There will be a departmental meeting on 02/12/2022 in the Department of Chemistry

All the members are requested to attend the meeting

Agenda

1) Coverage of syllabus for I, II & III Semesters.
2) Assess syllabus for II year students
3) Orientation program for I year students
4) Conduct of mid - II Exams & Certificate Course
5) Celebration of national Science day

HOD

All the members

Minutes of the departmental meeting

The departmental meeting was held at 3:30 pm in the department of Chemistry

The following resolutions were made and received the following

1. The members expressed their satisfaction towards the completion of syllabus as per schedule for II & III year students.
2. The syllabus given by the absence of I year students was verified and taken a note.
3. It is resolved to take orientation and bridge classes to first year students.
4. The members are not satisfied with the attendance of students and result of last exam.
5. It is resolved to take the measurement steps and to conduct certificate course on water analysis
6. It is resolved to celebrate national Science day.

Signature of members

Signature of HOD

Dr. K. Rani Lakshmi

DEPARTMENTAL MEETING CUM MINUTES

Minutes of departmental meeting on certificate course

The faculty members of Department of Chemistry met in the Principal's chamber under the chairperson ship of Dr.G.Giri Babu at 3 PM on Dt:01.12.2021 discussed and resolved as detailed here under.

After the thorough discussion on the agenda of conducting certificate course as per the departmental action plan, it was resolved to

1. Conduct a certificate course titled Water Analysis with a duration of 30 hours during the working days
2. Frame the syllabus and regulations for the successful completion of certificate course
3. Conduct the examination after the completion of course and issue certificate to the qualified students
4. Set 40% of marks as eligibility for the completion of the course
5. Serve notice to the students well in advance for the enrolment into this course
6. Commence the course on the date fixed obtaining due permission from the chair.

Signatures of the faculty

Incharge
Department of Chemistry
SAS GOVERNMENT DEGREE COLLEGE
NARAYANAPURAM-534 406

Principal

PRINCIPAL
SAS GOVT. DEGREE COLLEGE
NARAYANAPURAM
West Godavari District.
Pin: 534 406, Andhra Pradesh

PERMISSION LETTER FOR CERTIFICATE COURSE

NARAYANAPURAM,
Dt.02.12.2021

From
The In-charge,
Department of Chemistry,
SAS GDC,
Narayanapuram.

To
The Principal,
SAS GDC,
Narayanapuram.

Sir,

Sub: Department of Chemistry ,SAS Govt. Degree College, Narayanapuram-Conduct of Certificate course in **Water analysis**(30 hours) -Accordance of permission requested-Reg.

Ref: Minutes of the departmental meeting dated 01.12.2021

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Adverting to the subject, I wish to submit to your kind self that the Department of Chemistry is planning to conduct a Certificate course in **"Water analysis"** with 30 hours duration for the students of our college as well as the general public . A resolution was passed to this effect in the Departmental meeting dated 01.12.2021. Hence I request you to kindly accord permission to conduct the same from 06.12.2021 onwards.

Thanking you sir.

Yours faithfully

Incharge
Department of Chemistry
SAS GOVERNMENT DEGREE COLLEGE
NARAYANAPURAM

Enclosures

1. A xerox copy of the minutes of Departmental meeting dt.01.12.20

PROCEEDINGS OF THE PRINCIPAL, SAS GOVT. DEGREE COLLEGE,NARAYANAPURAM

PRESENT: Dr.G.Giri Babu. M.Sc.,Ph.D

DATE:03.12.2021

To
The In-charge,

Department of Chemistry,

SAS GDC

Narayanapuram .

Sir/Madam,

Sub: SAS Govt. Degree college, Narayanapuram- Conduct of certificate course in

Water analysis– Permission accorded- Reg.

Adverting to the subject, I here by draw the kind attention of the in-charge of department of Chemistry of this college ,that a decision was taken in the staff council meeting dated 01.12.2021 after much discussions and deliberation to approve and accord permission for the conduct of a certificate course" **Water Analysis**" with 30 hours duration for the general public as well as the students of our college from dt.06.12.2021.

You are further instructed to make all the necessary preparations and arrangements for the commencement of the course on dt.06.12.2021

PRINCIPAL

PRINCIPAL
SAS GOVT. DEGREE COLLEGE
NARAYANAPURAM
West Godavari District.
Pin: 534 406, Andhra Pradesh

NOTICE

NARAYANAPURAM

Dt.02.12.2021

All the students of SAS Govt. Degree college, Narayanapuram are hereby informed that the Department of Chemistry is intending to conduct a certificate course in" Water analysis" from 06.12.2021 onwards . The required permission from the honorable Principal of the college has been obtained. Hence the students who are interested in enrolling themselves for the course may please contact the in-charge of the department for further details on or before dt.05.12.2021

Initials of the Principal

In-charge of the dept.

Incharge
Department of Chemistry
SAS GOVERNMENT DEGREE COLLEGE
NARAYANAPURAM-534 406

Highlights of the certificate course in Water Analysis

Introduction

Water is the universal solvent. It is essential for the growth and development of all forms of life. It regulates physical, chemical and biological process in the living organisms. The main source of water for is through precipitation. Water can be used for direct and indirect purposes. Direct purposes include bathing, drinking, and cooking.The bulk of the world's water use is for agriculture, industry, and electricity. The most common water uses include:

- Drinking and Household Needs
- Recreation
- Industry and Commerce
- Agriculture
- Thermoelectricity/Energy

Objectives of the courses

- To determine the quality of the water
- To reduce the environmental impacts due to water amendments.
- To understand the effects of water quality parameters and to learn the laboratory techniques.

Course Outcomes

After successful completion of the course the student will be able to

- Know that Water quality testing is an important part of environmental monitoring.
- To know that if quality of water is poor, it affects not only aquatic life but the surrounding parts of ecosystem.
- Measure physical properties of water quality include temperature and turbidity, Chemical properties involve parameters such as P^H, E.C, TDS, CO_3^{2-}, HCO_3^-, Cl^-, Ca^{2+}, Mg^{2+}. The above parameters are studied in the water bodies of Narayanapuram surroundings.

- Increase the knowledge and understand the specific issues of a water body.

Syllabus of the course

Unit – I (5) hrs

1. Introduction
   a) Water Resources
   b) Ways of Pollution
   c) Water Treatment

Unit – II (5) hrs

2. Water Pollution – (3) Types
   a) Effect of Contamination on living organism
   b) Health Problems faced by Consuming Polluted Water

Unit - III (3) hrs

How to reduce water pollution

Unit - IV (3) hrs

Field Trip

Experiments - Practical's (10) hrs

1. Collection of Samples
2. pH Value
3. Electrical conductance
4. Total dissolved salts
5. Carbonates and bicarbonates (Alkalinity)
6. Chloride ion
7. Determination of Ca2+ and Mg2+
8. Total hardness of water

Methodology of Sample Collection:

The water samples are collected in a fresh, unused plastic bottles of 2 ltrs capacity from borewells, municipal taps and open wells.

Experimental procedures :

Determination of P^H: The P^H of water sample is determined by using P^Hmeter.

Determination of total soluble salts (E.C.): The E.C of water is determined by conductivity bridge.

Alkality of Water: The Alkality of water is determined by titrating against 0.1 N HCl using phenolphthalein indicator. It gives the amount of carbonates present in the water sample. Alkality of water is also determined by titrating against 0.1 N HCl using methyl orange indicator. This gives the amount of bicarbonates present in the water sample.**Determination of Chlorides:** The Chlorides present in the water is determined by Argento metric titration.

Determination of total hardness of water (Ca^{+2} and Mg^{+2}): The hardness of water is not a pollution parameter but indicates water quality. The water analysis is done by complexometric titration with EDTA using EBT indicator.

List of students enrolled for certificate course

S.No	Regd.No.	Name of the Student	Program of study
1.	193557101001	B.SWATHI	III B.Sc (MPC)
2.	193557101003	G.YAMUNA DURGA	III B.Sc (MPC)
3.	193557101005	M.KANAKA DURGA	III B.Sc (MPC)
4.	193557101006	S.PAVAN KUMAR	III B.Sc (MPC)
5.	193557101007	B.CHINNA RAO	III B.Sc (MPC)
6.	193557101008	V.MANI SAI KUMAR	III B.Sc (MPC)
7.	193557101009	Y.VARA PRASAD	III B.Sc (MPC)
8.	193557110010	A.JAGADEESH	III B.Sc (BZC)
9.	193557110012	CH.ANIL KUMAR	III B.Sc (BZC)
10.	193557110013	D.KIRANMAI	III B.Sc (BZC)
11.	193557110014	G.RATNAKAR	III B.Sc (BZC)
12.	193557110016	K.D.BHAVANI	III B.Sc (BZC)
13.	193557110019	N.NAGA LAKSHMI	III B.Sc (BZC)
14.	193557110020	N.REVATHI	III B.Sc (BZC)

Attendance

S. No	Regd.No.	Name of the Student	Day 1	Attendance Particulars 2	3	4	5	6	7	8	9	10	11	12	13	14	15
1.	193557101001	B.SWATHI	P	P	P	P	P	P	P	A	P	P	P	A	P	P	P
2.	193557101003	G.YAMUNA DURGA	P	P	A	A	P	P	P	P	P	P	P	P	P	P	A
3.	193557101005	M.KANAKA DURGA	A	P	P	P	P	P	P	P	A	P	P	P	P	P	P
4.	193557101006	S.PAVAN KUMAR	P	P	P	P	P	A	P	P	P	P	P	A	P	P	P
5.	193557101007	B.CHINNA RAO	P	A	P	A	P	P	P	A	P	P	P	P	P	P	P
6.	193557101008	V.MANI SAI KUMAR	P	P	P	P	P	P	A	P	P	P	P	P	P	A	P
7.	193557101009	Y.VARA PRASAD	P	P	P	P	P	P	P	P	P	P	P	P	P	A	A
8.	193557110010	A.JAGADEESH	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
9.	193557110012	CH.ANIL KUMAR	A	P	A	P	P	P	P	P	P	P	P	P	P	P	P
10.	193557110013	D.KIRANMAI	P	A	P	P	P	P	P	A	P	P	P	A	P	P	P
11.	193557110014	G.RATNAKAR	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
12.	193557110016	K.D.BHAVANI	P	P	P	P	P	A	P	P	P	P	P	P	P	P	P
13.	193557110019	N.NAGA LAKSHMI	A	A	A	P	P	P	P	P	P	P	P	P	P	A	P
14.	193557110020	N.REVATHI	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
15	193557110023	P.V.S.N. SAI KRISHNA	P	P	A	P	P	P	P	P	A	P	P	P	P	P	P

S. No	Regd.No.	Name of the Student	Day 16	Attendance Particulars 17	18	19	20	21	22	23	24	25	26	27	28	29	30
1.	193557101001	B.SWATHI	P	P	P	P	P	A	P	P	P	P	P	P	P	P	P
2.	193557101003	G.YAMUNA DURGA	P	P	P	P	P	P	P	P	A	P	P	P	P	P	A
3.	193557101005	M.KANAKA DURGA	A	P	P	P	P	P	P	P	P	P	P	P	P	P	P
4.	193557101006	S.PAVAN KUMAR	P	P	P	P	P	P	P	P	P	P	P	A	P	A	P
5.	193557101007	B.CHINNA RAO	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
6.	193557101008	V.MANI SAI KUMAR	P	P	A	P	P	A	P	P	P	P	P	P	P	P	A
7.	193557101009	Y.VARA PRASAD	A	P	P	P	P	P	P	P	P	P	P	P	P	P	P
8.	193557110010	A.JAGADEESH	P	P	P	P	P	P	P	A	P	P	P	P	P	P	P
9.	193557110012	CH.ANIL KUMAR	P	P	P	P	P	A	P	P	P	P	P	P	P	P	P
10.	193557110013	D.KIRANMAI	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
11.	193557110014	G.RATNAKAR	A	P	P	P	P	P	P	A	P	P	P	A	P	P	A
12.	193557110016	K.D.BHAVANI	P	P	P	A	P	P	P	P	P	P	P	P	P	P	P
13.	193557110019	N.NAGA LAKSHMI	P	A	P	P	P	P	P	P	P	P	P	A	P	P	P
14.	193557110020	N.REVATHI	P	P	P	P	P	A	P	P	P	P	P	P	P	P	P
15	193557110023	P.V.S.N.SAI KRISHNA	P	P	A	P	P	P	P	A	P	P	P	A	P	A	P

Question paper

MULTIPLE CHOICE QUESTION PAPER FOR WATER ANALYSIS

Maximum marks 25X2 = 50

1. Hardness of water is due to the presence of salts of (A)
   a) Potassium
   b) Chlorine
   c) Magnesium
   d) Boron

2. Hardness of water is conventionally expressed in terms of equivalent amount of

(C)
   a) H_2CO_3
   b) $MgCO_3$
   c) $CaCO_3$
   d) $Na_2 CO_3$

3. The chemical equivalent of $MgSO_4$ salt is (A)

   a) 60
   b) 47.5
   c) 82
   d) 68

4. Which of the following is not a unit of hardness? (B)

   a) Parts per million
   b) Degree centigrade
   c) Degree Clarke
   d) Degree French

5. EDTA method for hardness determination is less accurate and inconvenient procedure. (A)

   a) True
   b) False

6. Fluoride is also added to water, which helps in preventing (D)

   a) Infection
   b) Sickness
   c) Fever
   d) tooth decay

7. An addition of small dose of chlorine gas to filtered water is known as (D)

a) coagulation
b) sedimentation
c) filtration
d) chlorination

8. Process in which water is passed through filter beds of sand and gravel to remove smaller particles of dust is called (C)

a) coagulation
b) sedimentation
c) filtration
d) chlorination

9. The Total dissolved solids (TDS) can be reduced by the following method (D)

a) Distillation
b) Reverse osmosis
c) Ion exchange
d) All of the above

10. According to the United States Geological Survey, water having less than 1000 ml/litre of total dissolved solids is (A)

a) Fresh water
b) Slightly saline
c) Moderately saline
d) Brine water

11. The following cause alkalinity in natural water. (D)

a)Potassium carbonate
b) Potassium bicarbonate
c) Sodium carbonate
d) All of the above

12. The following cause alkalinity as well hardness in natural water. (D)

a) Calcium carbonate
b) Calcium bicarbonate
c) Magnesium carbonate
d) All of the above

13. Temporary hardness is caused due to (D)

a) Magnesium carbonate
b) Calcium carbonate
c) Magnesium sulphate
d) Magnesium chloride

14. Permanent hardness is caused due to (C)

a) Magnesium carbonate
b) Magnesium bicarbonate
c) Magnesium sulphate
d) All of the above

15. According to WHO, the soft water has 0 to ____ milligram per litre as $CaCO_3$. (B)

a) 30
b) 60
c) 90
d) 120

16. Fluorides can be removed by (D)

a) Reverse osmosis
b) Lime softening
c)Ion exchange
d) All of the above

17. The source of Arsenic in water is (D)

A) Industrial waste
b) Fertilizers
c) Phosphate rocks
d) All of the above

18.The process of nutrient enrichment is termed as (A)

a) Eutrophication
b) Limiting nutrients
c) Enrichment
d) Schistosomiasis

19. What percent of freshwater consist of rivers on earth? (C)

b) 0.04%
c) 0.01%
d) 0.03%
e) 0.01%

20. When rain water flows over ground surface resulting in streams and rivers is called

a) run-off (A)
b) flooding
c) tsunami
d) Drainage

21. What is the name quantitative titration to remove hardness of water? (A)

a) Complexometric titrations
b) Volumetric titrations
c) Gravimetric titrations
d) None of the above

22. How the amount of chloride ion present in water sample identified. (B)

a) Acid-base titrations
b) Precipitation titrations
c) Complexometric titrations
d) Gravimetric titrations

23. What is the name of indicator used in complex metric titrations (C)

a) methyl orange
b) Phenolphthalein
c) Eriochrome Black –T
d) methyl blue

24. How the alkalinity of water can be tested (B)

a) Complexometric titrations
b) Volumetric titrations
c) Gravimetric titrations
d) All of the above

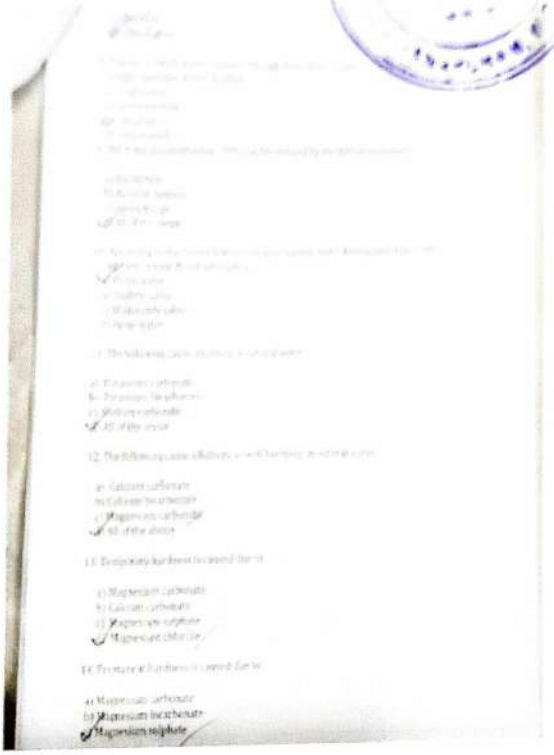
25. What is instrument used to determine the P^H of water (B)

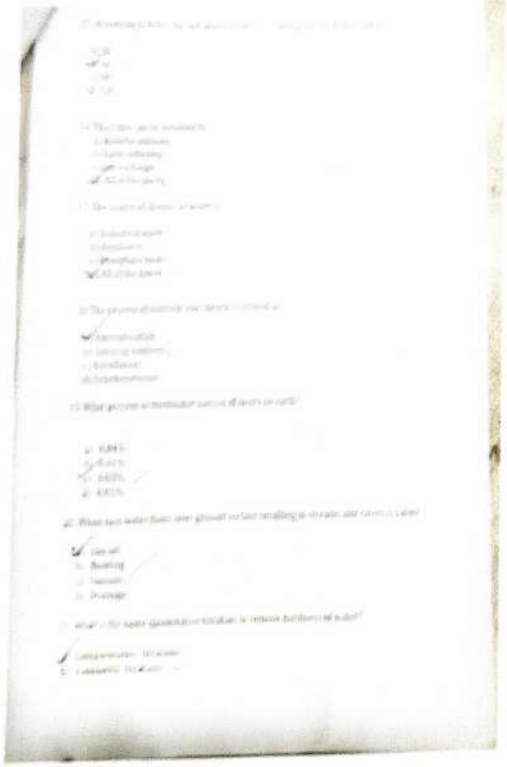
a) Conductometer
b) P^H meter
c) Spectrophotometer
d) None of the above

Evaluation: Examination in the form of multiple choice questions **(1hr)** for 2x25= 50 marks

Reference:

1. Environmental chemistry by A.K.De
2. Quantitative Analysis by A.I.Voguel
3. Internet





c) Gravimetric titrations
d) None of the above

22. How the amount of chloride ion present in water sample identified
a) acid-base titrations
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d) Gravimetric titrations

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c) Gravimetric titrations
d) All of the above

25. What is instrument used to determine the P^H of water
a) Conductometer
b) P^H meter
c) Spectrophotometer
d) None of the above

S.No	Parameter (s) / Name of Test	Units	Narayanapuram Borewell	Nidamarru Tap Water	Rachuru Tap Water	Ravulaparru Borewell	Chebrolu Tap Water	Drinking water specifications as per IS : 10500 : 2012
1	pH	----	6.04	6.62	6.41	6.17	6.36	**6.5 – 8.5**
2	Electrical Conductivity	µS /cm	587	43	47	896	351	**----**
3	Alkalinity	mg /L	228	20	16	332	104	**200**
4	Total Hardness	mg /L	200	10	20	250	130	**200**
5	Calcium (Ca^{2+})	mg /L	64	4	4	76	36	**75**
6	Magnesium (Mg^{2+})	mg /L	10	0	3	15	10	**30**
7	Chlorides	mg /L	74	49	54	103	74	**250**

CERTIFICATE

Submit Comment

SRI ARAVINDA SATHAJAYANTHI GOVERNMENT DEGREE COLLEGE

NARAYANAPURAM, ELURU DISTRICT, ANDRHA PRADESH

CERTIFICATE OF COMPLETION

This is to certify that Mr./Ms. B. Swathi of III B.Sc MPC has successfully completed certificate course on WATER ANALYSIS in (30 hours) conducted from 06/12/21 to 10/01/2022 By the Department of Chemistry.

Course Coordinator

Incharge
Department of Chemistry
SAS GOVERNMENT DEGREE COLLEGE
NARAYANAPURAM-534 406

IQAC Coordinator

Principal

PRINCIPAL
SAS GOVT. DEGREE COLLEGE
NARAYANAPURAM
West Godavari District.
Pin: 534 406, Andhra Pradesh

Photographs of the activity

Students attending Theory & Practical classes

Report on Certificate Course in Water Analysis

The Department of Chemistry of SAS GDC , Narayanapuram conducted a certificate course in Water analysis from 06.12.2021 to 10.01.2022 with 30 Hrs duration. Smt.G.Hephzibah acted as the instructor for the course and 15 Students of III B.Sc (MPC&BZC) enrolled for the course.

The course commenced on the AN of 06.12.2021.A total number of 30 instruction hours(Both Theory and practicals) were conducted to enhance the knowledge levels of the student on Water analysis. As a part of this course, students were given hands on training at Dept. of Chemistry. The students observed different analytical techniques used in Water analysis for three days. Water testing is a low-cost practice to learn about the quality of water to support the life on earth.

At the end of the course a test was conducted for 50 marks with 40% of marks(20 Marks) as eligibility criterion for the completion of the course. On the last day of the course certificates were issued to the students who had successfully completed the course.