



महाराष्ट्र राज्य माध्यमिक व उच्च माध्यमिक शिक्षण मंडळ
पुणे विभागीय मंडळ, पुणे

शिवाजीनगर, पुणे ४११००४
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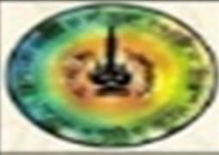
इ. 12वी प्रात्यक्षिक परीक्षा पूर्वतयारी

उच्च माध्यमिक प्रमाणपत्र परीक्षा (इ. १२ वी), फेब्रु.-मार्च २०२६-२७
साठी मार्गदर्शक ऑनलाईन सत्र

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सर्व संबंधित प्राचार्यांसाठी आणि विषय शिक्षकांसाठी अनिवार्य



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इ. 12वी प्रात्यक्षिक परीक्षा पूर्वतयारी

उच्च माध्यमिक प्रमाणपत्र परीक्षा (इ. १२ वी), फेब्रु.-मार्च २०२६-२७
साठी मार्गदर्शक ऑनलाईन सत्र

विषय : रसायनशास्त्र (55)

मार्गदर्शक तज्ञ :

डॉ. रविंद्र पवार

श्री. राजू नंदनवार

श्री. योगेशचंद्र देवळालकर

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Guidelines for teachers to give Instructions to Students

Students Should Carry Following things

1. Id- card
2. Hall ticket
3. Certified Journal
4. Lab coat is mandatory.
5. Match box
6. Napkins

Important Instructions

- ✓ Present in lab 30 minutes before your examination scheduled time.
- ✓ Please eat before you come

महाराष्ट्र राज्य माध्यमिक व उच्च माध्यमिक शिक्षण मंडळ, पुणे विभागीय मंडळ, पुणे



Preparation by teachers for the Practical Examination

- Number of Students per batch should be 20- 40, as per the capacity of the college lab.
- Display a proper exam schedule to the students .
- Keep the following printouts ready-
 - i. Printout of practical question paper
 - ii. Batch-wise attendance of students.
 - iii. Batch-wise mark list.
- Lab should be ready one day before the practical examination with all required apparatus and chemicals.

महाराष्ट्र राज्य माध्यमिक व उच्च माध्यमिक शिक्षण मंडळ, पुणे विभागीय मंडळ, पुणे



Practical Examination Board Writing

- **HSC Board Practical Examination – Feb 2027**
- **Subject - Chemistry**
- **Name of College -**
- **Centre number -**
- **College Index No. –**

महाराष्ट्र राज्य माध्यमिक व उच्च माध्यमिक शिक्षण मंडळ, पुणे विभागीय मंडळ, पुणे



Preparation by teachers for Question No. 1 & 2

Q. No.	Experiments	Time	Marks	Remarks
1	Certified Journal	--	5	Compulsory
	Oral (Experiment/activity base)	5 min	5	Compulsory
2	Volumetric Analysis	90 min	10	Compulsory

महाराष्ट्र राज्य माध्यमिक व उच्च माध्यमिक शिक्षण मंडळ, पुणे विभागीय मंडळ, पुणे



Preparation by teachers for Question No 3

QUESTION NO - 3

TABLE NO		Experiment Name	TABLE NO		Experiment Name
1	11	Chemical Kinetics	6	16	Chemical Kinetics
2	12	Enthalpy of Neutralization + FG + Test For Protein/Carbohydrate	7	17	Enthalpy of Displacement + Activity (EMF)
3	13	Preparation of Potash Alum + Activity (RIC)	8	18	Preparation of Mohr's Salt + FG + Test For Protein/Carbohydrate
4	14	Basic Radicals	9	19	Basic Radicals
5	15	Acidic Radicals + FG + Test For Protein/Carbohydrate	10	20	Acidic Radicals + Activity (RIC)

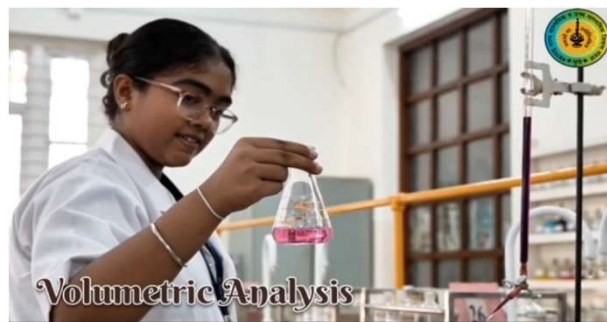
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Volumetric Analysis

10 Marks

- **Aim** - To determine the concentration in terms of molarity of KMnO_4 by titrating it against a standard solution of oxalic acid
- **A- Preparation of standard solution of oxalic acid.**
- **B- Determine the molarity of KMnO_4 by titrating it against a standard solution of oxalic acid**
- **Apparatus**- 100mL volumetric flask, balance, beaker, glass rod, Burette, Pipette, Conical Flask, test tube.
- **Chemicals** - Oxalic acid (0.63g), distilled water, KMnO_4 solution, dil. H_2SO_4



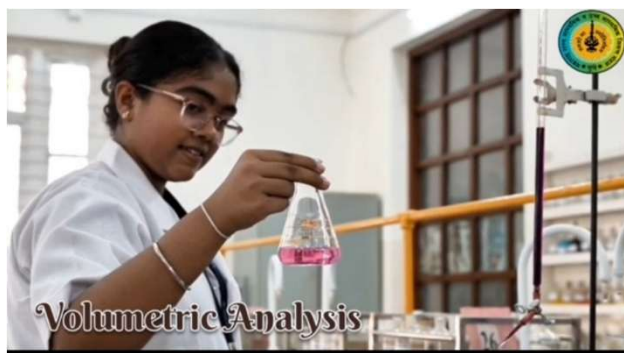
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Volumetric Analysis

10 Marks

- **Aim-** To determine the concentration in terms of molarity of KMnO_4 by titrating it against a standard solution of Ferrous ammonium sulphate
- **A-** Preparation of standard solution of FAS.(Mohr's Salt)
- **B-** Determine the molarity of KMnO_4 by titrating it against a standard solution of FAS.
- **Apparatus-** 100mL volumetric flask, balance, beaker, glass rod, Burette, Pipette, Conical Flask, test tube.
- **Chemicals** – FAS (1.96 g), distilled water, KMnO_4 solution, dil. H_2SO_4



महाराष्ट्र राज्य माध्यमिक व उच्च माध्यमिक शिक्षण मंडळ, पुणे विभागीय मंडळ, पुणे



Minimum Requirement for volumetric analysis experiment for the Batch of 20 students

S. No	Glass ware / Chemicals	Quantity
1	Burette	22
2	100mL Volumetric flask	22
3	Beaker 100 mL	22
4	Beaker 250 mL	22
5	Pipette	22
6	Glass rod	22
7	Conical Flask	22
8	Test tube	22
9	KMnO ₄ Solution for Oxalic acid (Approx. 79 g for 10 Lit)	
10	KMnO ₄ Solution for FAS (Approx. 39.5 g for 10 Lit)	
11	dil. H ₂ SO ₄ 2M	

महाराष्ट्र राज्य माध्यमिक व उच्च माध्यमिक शिक्षण मंडळ, पुणे विभागीय मंडळ, पुणे



Marking Scheme

S. No	Q. 2 Compulsory Volumetric Analysis	Mark Distribution
1	Accurate weighing of Oxalic acid/FAS	1
2	Preparation of standard solution	2
3	Observation	2
4	Accuracy of burette reading	3
5	± 0.2 mL - 3 Marks	
6	± 0.3 mL - 2 Marks	
7	± 0.4 mL - 1 Marks	
8	± 0.5 mL - 0 Marks	
9	Calculation	1
10	Result	1
11	Total Marks	10

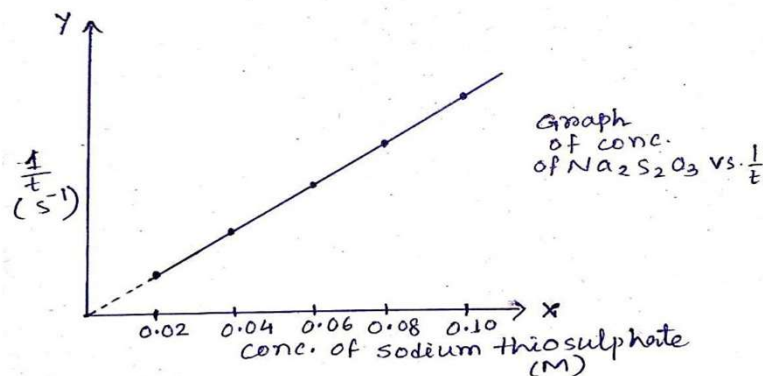
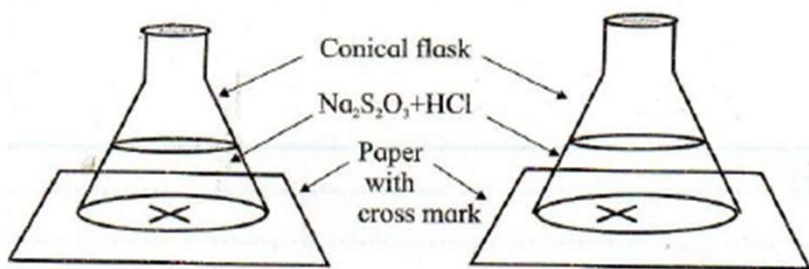
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Chemical Kinetics

10Marks

- **Aim** - To study the effect of concentration on the rate of reaction between sodium thiosulphate ($\text{Na}_2\text{S}_2\text{O}_3$) and hydrochloric acid (HCl)
- **Apparatus** - Burette, Pipette, conical flasks, stop watch, white paper with cross mark, measuring Cylinder.
- **Chemicals** - 0.1M $\text{Na}_2\text{S}_2\text{O}_3$, 0.1 M HCl and distilled water.
- Graph



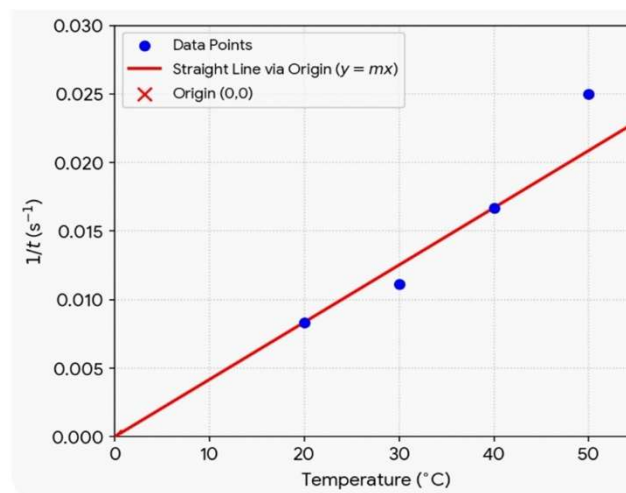
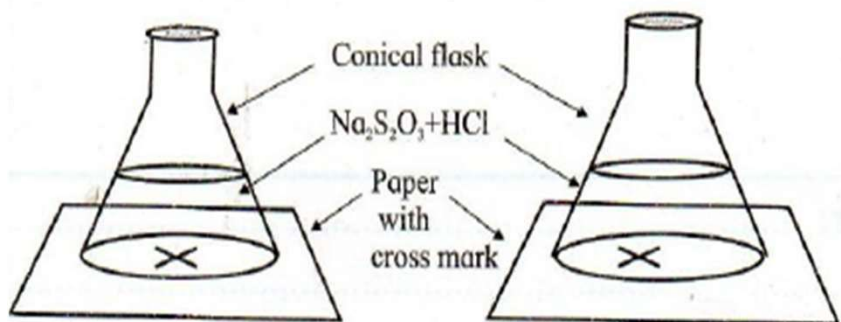
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Chemical Kinetics

10Marks

- **Aim** - To study the effect of temperature change on the rate of reaction between sodium thiosulphate ($\text{Na}_2\text{S}_2\text{O}_3$) and hydrochloric acid (HCl)
- **Apparatus** – Burette, Pipette, conical flasks, stop watch, white paper with cross mark, measuring Cylinder.
- **Chemicals** - 0.1M $\text{Na}_2\text{S}_2\text{O}_3$, 0.1M HCl and distilled water.



महाराष्ट्र राज्य माध्यमिक व उच्च माध्यमिक शिक्षण मंडळ, पुणे विभागीय मंडळ, पुणे



Minimum Requirement for Chemical kinetics Experiment per students

S. No	Glass ware / Chemicals	Quantity
1	Conical Flask	4
2	Beaker 100 mL	1
3	Measuring cylinder 50 mL	1
4	Measuring cylinder 10 mL	1
5	Stop watch	1
6	Graph Paper	1
7	Thermometer 1/10 ⁰ c	1
8	Na ₂ S ₂ O ₃ solution (0.1 M) and HCl (1M)	

महाराष्ट्र राज्य माध्यमिक व उच्च माध्यमिक शिक्षण मंडळ, पुणे विभागीय मंडळ, पुणे



Marking Scheme

Q.3A Option Chemical Kinetics	Mark Distribution
Conduction of experiment	3
Observation	3
Calculation	2
Graph	1
Result	1
Total Marks	10

महाराष्ट्र राज्य माध्यमिक व उच्च माध्यमिक शिक्षण मंडळ, पुणे विभागीय मंडळ, पुणे



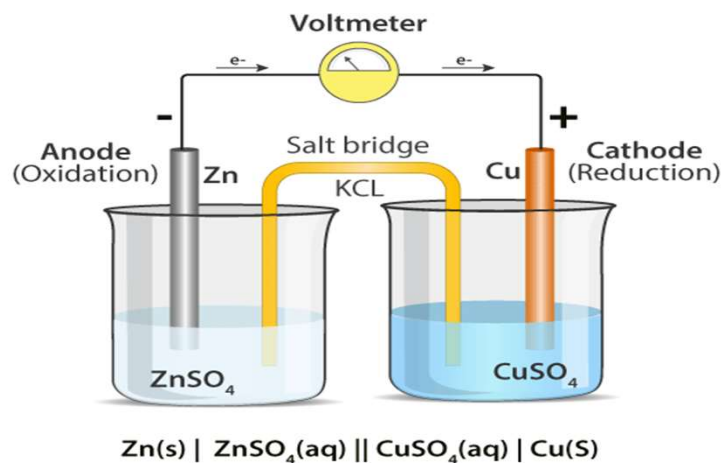
Electrochemistry

10 Marks

Aim: study of variation of cell potential of cell $\text{Zn} | \text{Zn}^{2+} || \text{Cu}^{2+} | \text{Cu}$ with change in concentration of electrolyte CuSO_4 and ZnSO_4 at room temperature.

Apparatus: Zinc plates (or rod), Copper plates (or rod), beaker (50 mL), Voltmeter, (potentiometer), salt bridge, etc.

Chemicals: 1.0 M ZnSO_4 solution, 0.2 M, 0.1 M, 0.05 M, 0.025 M and 0.0125 M CuSO_4 solution etc.



Plot the graph for the $\text{Log}_{10}[\text{Cu}^{2+}]$ against E_{cell}

महाराष्ट्र राज्य माध्यमिक व उच्च माध्यमिक शिक्षण मंडळ, पुणे विभागीय मंडळ, पुणे



Marking Scheme

Q.3 Option Electrochemistry	Mark Distribution
Conduction of experiment	3
Observation	3
Calculation	3
Result	1
Total Marks	10

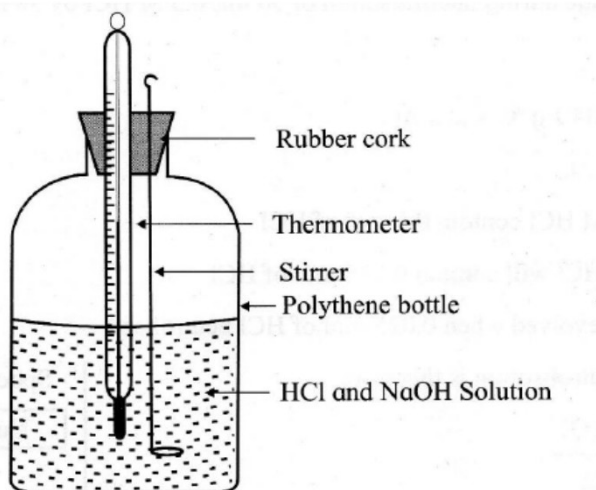
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Thermochemistry

6 Marks

- **Aim** - To determine Enthalpy of neutralization of strong acid (HCl) & strong base (NaOH)
- **Apparatus** - Polythene bottle, rubber cork, stirrer, beaker thermometer (0.1°C accuracy), measuring cylinder etc.
- **Chemicals** - 0.5 N HCl, 0.5 N NaOH



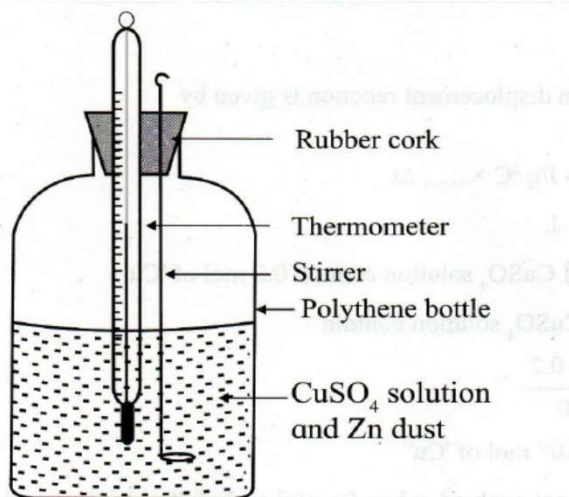
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Thermochemistry

6 Marks

- **Aim** - To determine heat of displacement (enthalpy change) of Cu^{2+} ions from CuSO_4 solution by Zn metal/dust.
- **Apparatus** - Polythene bottle, rubber cork, stirrer, thermometer (0.1°C accuracy), measuring cylinder, beaker, balance.
- **Chemicals** - 0.2 M copper sulphate solution, zinc powder



महाराष्ट्र राज्य माध्यमिक व उच्च माध्यमिक शिक्षण मंडळ, पुणे विभागीय मंडळ, पुणे



Marking Scheme

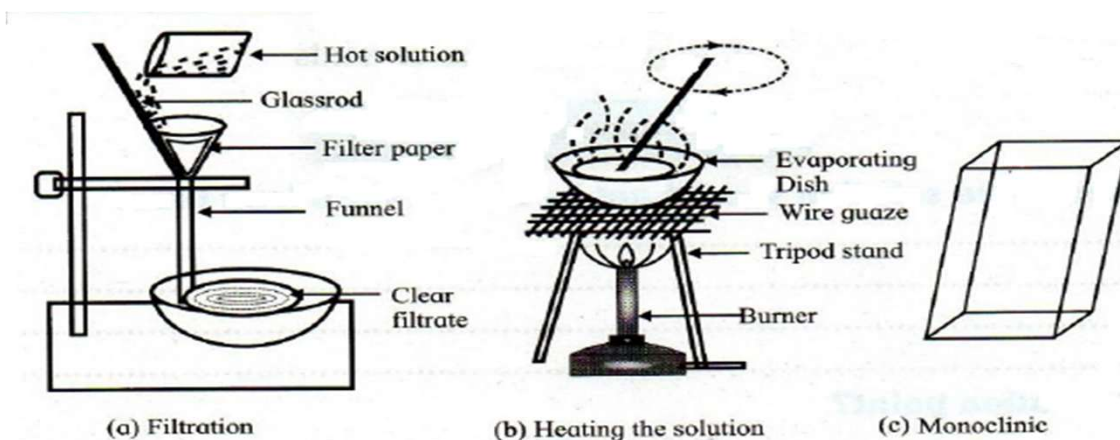
Q.3 Option Thermochemistry	Mark Distribution
Conduction of experiment	2
Observation	2
Calculation	1
Result	1
Total Marks	6

महाराष्ट्र राज्य माध्यमिक व उच्च माध्यमिक शिक्षण मंडळ, पुणे विभागीय मंडळ, पुणे



Preparation of Inorganic Compounds 6 Marks

- **Aim - Preparation of ferrous ammonium sulphate (Mohr's Salt)**
- **Apparatus:** Porcelain dish, beakers, measuring cylinder, glass rod, tripod stand, wire gauze, funnel and pair of tongs etc.
- **Chemicals:** 1.5 g Ammonium sulphate, 3.5 g Ferrous sulphate, 2-3 mL dil. H_2SO_4 and ethyl alcohol.

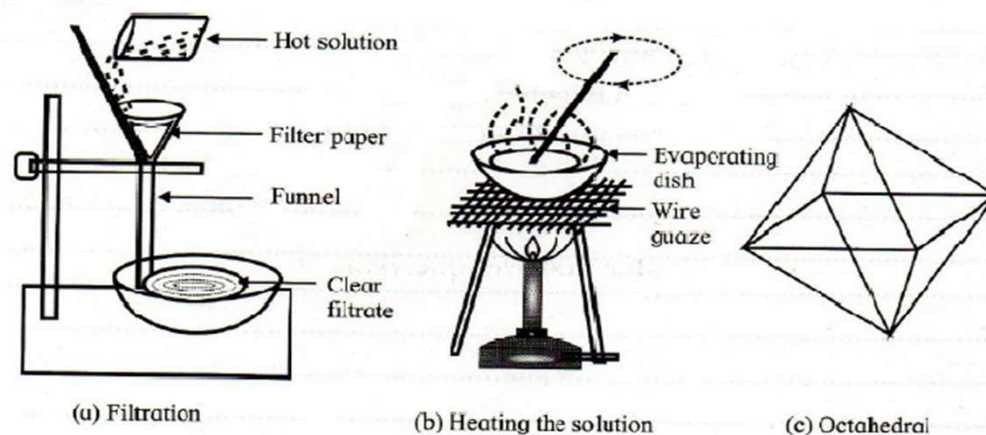


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Preparation of Inorganic Compounds 6Marks

- **Aim:** To prepare a pure sample of potash alum [$\text{K}_2\text{SO}_4 \text{ Al}_2 (\text{SO}_4)_3 \cdot 24\text{H}_2\text{O}$]
- **Apparatus:** Funnel, Porcelain dish, beakers, glass rod, tripod stand, wire gauze etc.
- **Chemicals:** 1.0 g K_2SO_4 (Potassium sulphate) and 4.0 g $\text{Al}_2 (\text{SO}_4)_3 \cdot 18\text{H}_2\text{O}$ (Aluminum sulphate). 2 mL dil. Sulphuric acid.

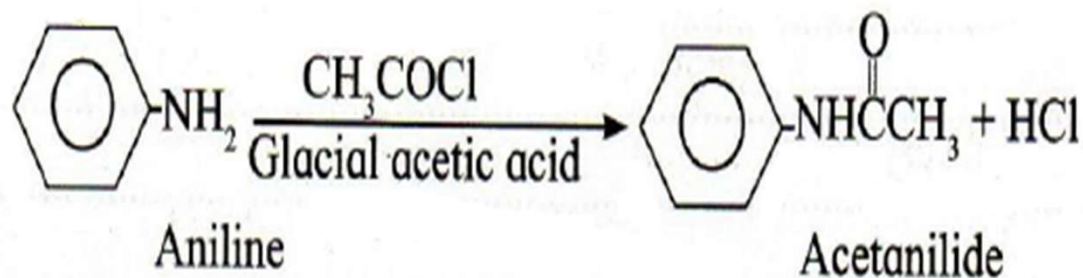


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Preparation of Organic Compounds 6 Marks

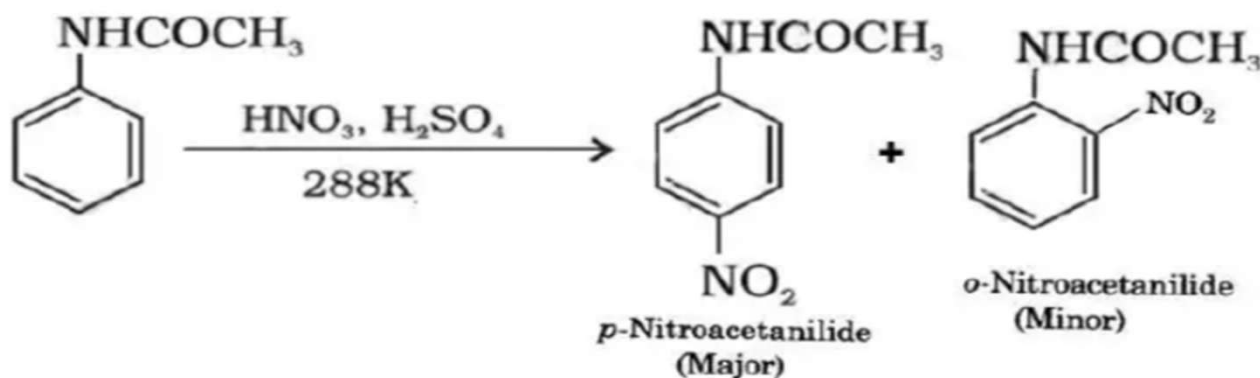
- **Aim:** To prepare acetanilide from acetyl chloride
- **Apparatus:** Boiling tube, water bath, beaker and funnel etc.
- **Chemicals:** 1 mL Aniline, 1 mL Acetic acid and 1 mL acetyl chloride, ice cold water.





Preparation of Organic Compounds 6Marks

- **Aim:** To prepare p-nitro acetanilide from acetanilide
- **Apparatus:** Test tubes, conical flask, glass rod, measuring cylinder and funnel.
- **Chemicals:** 1 mL Conc. HNO_3 , 4 mL Conc. H_2SO_4 , 2 mL glacial acetic acid, 2 g acetanilide, methylated spirit. Ice bath



महाराष्ट्र राज्य माध्यमिक व उच्च माध्यमिक शिक्षण मंडळ, पुणे विभागीय मंडळ, पुणे



Minimum requirement of Chemicals and Glassware For Organic and Inorganic Preparation

Sr. No.	Required Glassware	Chemicals	Chemicals
1	Tripod	Ammonium Sulphate	Acetone
2	Burner	Ferrous Sulphate	Ethanol
3	Evaporating/China Dish	Sulphuric acid	10% NaOH
4	Funnel	Potassium Sulphate	Aniline
5	Beaker	Aluminium Sulphate	NaNO ₂
6	Wire Gauze	Ferric Chloride	Conce. HCl
7	Pair of tongs	Oxalic acid	B-Naphthol
8	Conical flask	Potassium Hydroxide	Acetic acid
9	Filter paper	Potassium Oxalate	CH ₃ COCl
10	Vacuum Pump	Benzaldehyde	

महाराष्ट्र राज्य माध्यमिक व उच्च माध्यमिक शिक्षण मंडळ, पुणे विभागीय मंडळ, पुणे



Marking Scheme

Q.3 Option Preparation of Inorganic Organic compound	Mark Distribution
Conduction of experiment	4
Observation & Result	2
Total Marks	6

महाराष्ट्र राज्य माध्यमिक व उच्च माध्यमिक शिक्षण मंडळ, पुणे विभागीय मंडळ, पुणे



Inorganic Qualitative Analysis 10Marks

Identification of two cations (Basic radicals**) from the given mixture of salts**

- Preliminary tests
- Dry tests for basic radicals
- Preparation of water solution (W.S.)
- Identification of basic radical and analysis of groups
- Confirmatory test (CT) of the detected basic radicals
- Result (Reporting the two basic radicals with their correct oxidation number)

Mixtures-

For (Cu^{++} , Pb^{++}) Can use $\text{Cu}(\text{NO}_3)_2 + \text{Pb}(\text{NO}_3)_2$

For (Ni^{++} , NH_4^+) Can use $\text{NiCl}_2 + \text{NH}_4\text{Cl}$

For (Fe^{+++} , Mg^{++}) Can use $\text{FeCl}_3 + \text{MgCl}_2$

For (NH_4^+ , Mg^{++}) Can use $\text{NH}_4\text{Cl} + \text{MgCl}_2$

महाराष्ट्र राज्य माध्यमिक व उच्च माध्यमिक शिक्षण मंडळ, पुणे विभागीय मंडळ, पुणे



Marking Scheme

Q.3 Option Detection of two Basic radicals	Mark Distribution
Dry Test	1
Detection of first group	2
Detection of second group	2
Analysis of first detected group with CT	2
Analysis of second detected group with CT	2
Result with correct charges	1
Total	10

महाराष्ट्र राज्य माध्यमिक व उच्च माध्यमिक शिक्षण मंडळ, पुणे विभागीय मंडळ, पुणे



Inorganic Qualitative Analysis 6 Marks

- Identification of two anions (**Acidic radicals**) from the given mixture of salts
 - Preliminary tests
 - Dry test for acidic radicals
 - Preparation of the original solution (O.S.)
 - Wet test for acidic radicals
 - Confirmatory test (CT)
 - Result of two acidic radicals.

Mixtures -

For (CO_3^{--} , NO_3^-)

can use $\text{K}_2\text{CO}_3 + \text{KNO}_3$ or $\text{Na}_2\text{CO}_3 + \text{NaNO}_3$

For (I^- , SO_4^{--})

can use $\text{KI} + \text{Na}_2\text{SO}_4$

For (Cl^- , PO_4^{--})

can use $\text{KCl} + \text{Na}_3\text{PO}_4$

For (Cl^- , SO_4^{--})

can use $\text{KCl} + \text{CuSO}_4$

महाराष्ट्र राज्य माध्यमिक व उच्च माध्यमिक शिक्षण मंडळ, पुणे विभागीय मंडळ, पुणे



Marking Scheme

Q.3 Option Detection of two Acidic Radicals	Mark Distribution
Dry Test	1
Detection of first radical with CT	2
Detection of second radical with CT	2
Result with correct charges	1
Total	06

महाराष्ट्र राज्य माध्यमिक व उच्च माध्यमिक शिक्षण मंडळ, पुणे विभागीय मंडळ, पुणे



Functional groups 2 Marks

- **Aim:** To determine the functional group of the given organic compound.
- **Apparatus-** Test tubes
- **Sample- any one**
 - Acetic acid, Oxalic Acid, Benzoic acid
 - β -naphthanol, resorcinol, Phenol
 - Benzaldehyde, glucose
 - Acetone
 - m-nitroaniline p-nitroaniline
 - ethyl alcohol
 - Naphthalene



Test for Carbohydrates, Proteins & Fats (any one)

2 Marks

- Aim – To detect the presence of carbohydrates in the given food stuff
- Sample –Potato Extract, rice, biscuits
- Aim - To detect the presence of proteins in the given food stuff
- Sample - Milk
- Aim: To detect the presence of oil or fats in the given food Stuff
- Sample – Butter, oil, ghee, ground nut powder



Marking Scheme

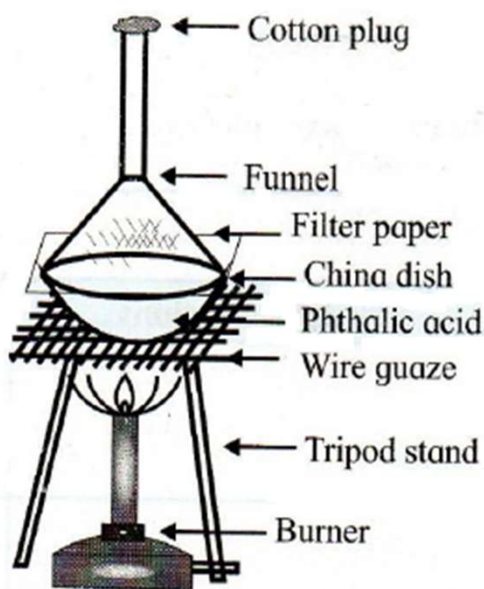
Q.3 Option FG/Test for Protein/Carbohydrates/Fats	Mark Distribution
Detection of Functional group	1
Result and structure of functional group	1
Total	2
Detection of Carbohydrates/Proteins/Fats/Oil in given food stuff with Result	2
Total	2

महाराष्ट्र राज्य माध्यमिक व उच्च माध्यमिक शिक्षण मंडळ, पुणे विभागीय मंडळ, पुणे



Activity -1

- **Aim** – To prepare phthalic anhydride
- **Apparatus**- Evaporating dish, Funnel, Cotton, tripod stand, wire gauze, pair of tongs, filter paper
- **Chemical**- 2 g Phthalic acid



महाराष्ट्र राज्य माध्यमिक व उच्च माध्यमिक शिक्षण मंडळ, पुणे विभागीय मंडळ, पुणे



Activity -2

- **Aim** – To prepare methyl salicylate (oil of winter green) qualitatively
- **Apparatus**- hard glass test Tube, beaker, test tube holder, burner.
- **Chemical**- 1 g Salicylic acid (solid powder), 2-3 mL Methyl alcohol, 1 mL Conc. H_2SO_4 .

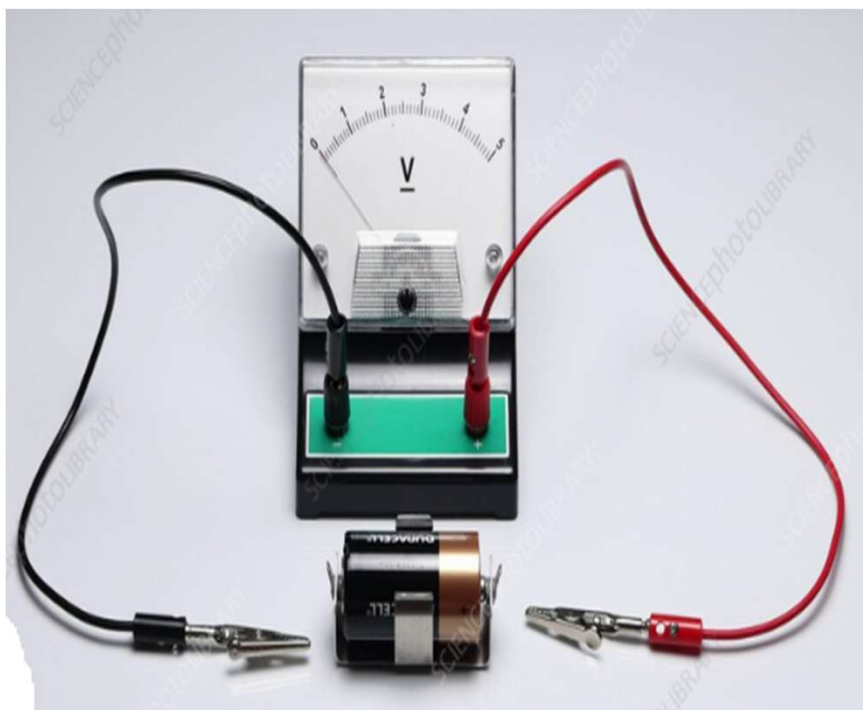


महाराष्ट्र राज्य माध्यमिक व उच्च माध्यमिक शिक्षण मंडळ, पुणे विभागीय मंडळ, पुणे



Activity -3

- **Aim** – Measurement of EMF of commercial cells by using voltmeter.
- **Apparatus**- AAA cell, AA cell, wrist watch cell, mobile phone battery, voltmeter and wire.

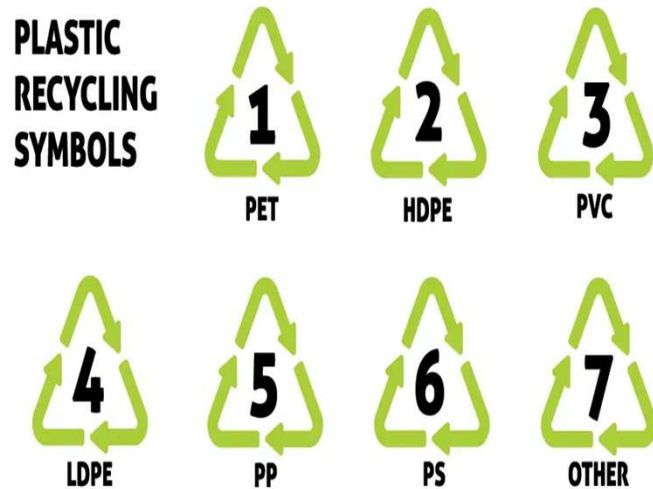


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Activity -4

- **Aim** – Identify Resin Identification Code (RIC) recycle symbols of plastics on different plastic materials.
- **Apparatus-** Various types of plastic materials.



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Marking Scheme

Q.3 Option Activity	Mark Distribution
Conduction of Activity	2
Observation and Result	2
Total	4

महाराष्ट्र राज्य माध्यमिक व उच्च माध्यमिक शिक्षण मंडळ, पुणे विभागीय मंडळ, पुणे

Time -3 hrs	Format of Question Paper	Mark 30
	Practical examination in Chemistry	Marks
Q. 1	a) Certified Journal	5
	b) Oral (viva) Practical/ Activity base	5
Q. 2	Quantitative estimation (Volumetric analysis)	10
Q. 3	Chemical Kinetics experiment (any one)	10
	OR	
	Electrochemistry experiment	10
	OR	
	Qualitatively analysis of two Basic radicals from the given mixture	10
	OR	
	A) Qualitatively analysis of two Acidic radicals from the given mixture	6
	B) Activity	4
	OR	
	B) Detection of functional group of given organic compound(any ONE) and Detection of carbohydrates, proteins, fats and oils in the given food stuff (any ONE)	4
	OR	
	A) Determination of enthalpy of neutralization/displacement	6
	B) Activity	4
	OR	
	B) Detection of functional group of given organic compound(any ONE) and Detection of carbohydrates, proteins, fats and oils in the given food stuff (any ONE)	4
	OR	
	A) Any one Inorganic/Organic Preparation	6
	B) Activity	4
	OR	
	B) Detection of functional group of given organic compound(any ONE) and Detection of carbohydrates, proteins, fats and oils (any ONE)	4



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पुणे विभागीय मंडळ, पुणे

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इ. 12वी प्रात्यक्षिक परीक्षा पूर्वतयारी

उच्च माध्यमिक प्रमाणपत्र परीक्षा (इ. १२ वी), फेब्रु.-मार्च २०२६-२७
साठी मार्गदर्शक ऑनलाईन सत्र

धन्यवाद !

महाराष्ट्र राज्य माध्यमिक व उच्च माध्यमिक शिक्षण मंडळ, पुणे विभागीय मंडळ, पुणे