DISTRICT PANCHAYATH KASARAGOD

EQUIP 2024

(Educational Quality Improvement Programme for class ten)

Student Support Material for Class X

CHEMISTRY

English Medium

DIET KASARAGOD

EQUIP 2024

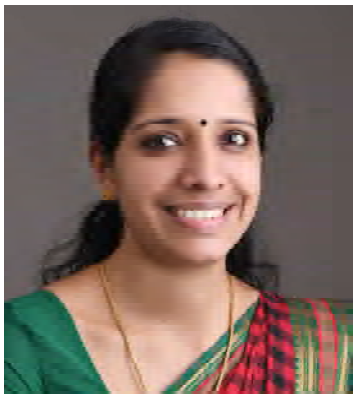
Chief Co-ordinators	:	**Nandikeshan N.** Deputy Director Education, Kasaragod **Dr. Raghurama Bhat K.** Principal, DIET Kasaragod
Co-ordinator	:	**Madhusoodanan V.** Lecturer, DIET Kasaragod
Resource Team		
Chemistry	:	Madhuri K.N., IHSS Ajanur Rajesh K.K.P., GHSS Cheemeni Remya K., GVHSS Heroor Meepry
DTP Layout	:	**GS Infotech**, Vidyanagar, Kasaragod.

ആശംസ

വികേന്ദ്രീകൃത ആസൂത്രണത്തിലൂടെയും നിർവ്വഹണത്തിലൂടെയും കേരളത്തിലെ ആരോഗ്യ വിദ്യാഭ്യാസ മേഖലകളെ ദേശീയ തലത്തിൽ ഒന്നാമതെത്തിക്കാൻ നമുക്ക് കഴിഞ്ഞിട്ടുണ്ട്. ഈ നേട്ടങ്ങൾ കൈവരിക്കാൻ പ്രാദേശിക ഭരണകൂടങ്ങൾ സ്തുത്യർഹമായ പങ്കുവഹിച്ചു. ദേശീയ സംസ്ഥാനതല പഠനങ്ങൾ നമ്മുടെ കുട്ടികളുടെ പഠനനിലവാരം ഇനിയും ഉയരേണ്ടതുണ്ട് എന്ന സൂചനയാണ് നൽകുന്നത്. പഠനവിടവുകൾ പരിഹരിക്കുന്നതിനുവേണ്ടി കാസർകോട് ജില്ലാ പഞ്ചായത്തിന്റെ നേതൃത്വത്തിൽ പൊതുവിദ്യാഭ്യാസ വകുപ്പും കാസർകോട് ഡയറ്റും ഒത്തുചേർന്ന് നടപ്പാക്കുന്ന **'എകിപ്പ്' (EQUIP)** പഠനപരിപോഷണ പരിപാടിക്ക് എല്ലാ പിന്തുണയും ഉറപ്പുതരുന്നു. പന്ത്രണ്ടാം ക്ലാസിലെ കുട്ടികൾക്കുവേണ്ടി ആദ്യമായാണ് ഇത്തരത്തിലൊരുദ്യമം. പൊതുപരീക്ഷകളെ അഭിമുഖീകരിക്കുന്ന പത്തും പന്ത്രണ്ടും ക്ലാസിലെ കുട്ടികളുടെ പഠനപ്രവർത്തനങ്ങളുടെ മികവിന്റെ അടയാളമായി മാറുകയാണ് വാർഷിക പരീക്ഷകൾ. അറിവിന്റെ തെളിമയോടെ ഓരോ വിദ്യാർത്ഥിക്കും പരീക്ഷ എഴുതാൻ കഴിയണം. വിദ്യാർത്ഥികളുടെ ജീവിതത്തിലെ ഏറ്റവും പ്രധാനപ്പെട്ട പരീക്ഷകൾക്ക് വേണ്ടി തയ്യാറാക്കിയ പഠനപിന്തുണാസാമഗ്രിക്ക് എല്ലാവിധ ആശംസകളും നേരുന്നു. നന്നായി പഠിക്കുക. പരീക്ഷയെ സധൈര്യം നേരിടുക. തളരാതെ മുന്നോട്ട്. വിജയം നിങ്ങളോടൊപ്പമുണ്ട്. ആശംസകൾ.

ശ്രീമതി ബേബി ബാലകൃഷ്ണൻ
ജില്ലാ പഞ്ചായത്ത് പ്രസിഡന്റ്
കാസർകോട്

ആശംസ



കാസർകോട് ജില്ലാ പഞ്ചായത്തിന്റെ നേതൃത്വത്തിൽ ജില്ലയിലെ പൊതുവിദ്യാഭ്യാസ മേഖലയെ ശക്തിപ്പെടുത്തുന്നതിന് നിരവധി പ്രവർത്തനങ്ങളാണ് നടന്നുവരുന്നത്. പൊതു വിദ്യാഭ്യാസ മേഖലയെ പൂർവ്വാധികം കരുത്തോടെ നാം മുന്നോട്ട് നയിക്കുകയാണ്. ഈ ഘട്ടത്തിലാണ് കാസർകോട് ജില്ലാ പഞ്ചായത്തും, പൊതുവിദ്യാഭ്യാസ വകുപ്പും, വിദ്യാഭ്യാസ പരിശീലന കേന്ദ്രവും (DIET) പത്താം ക്ലാസ്, പ്ലസ്ടു വിദ്യാർത്ഥികളുടെ പഠനവിടവുകൾ പരിഹരിക്കുന്നതിനും ആത്മവിശ്വാസത്തോടെ പൊതുപരീക്ഷയെ നേരിടാൻ അവരെ പ്രാപ്തരാക്കുന്നതിനും വേണ്ടി പഠനപരിപോഷണ സാമഗ്രി തയ്യാറാക്കുന്നത്. നിരന്തരമായ ഇടപെടലിന്റെ തുടർച്ചയായി ഈ വർഷം ആദ്യമായിട്ടാണ് പ്ലസ്ടു വിദ്യാർത്ഥികൾക്കുവേണ്ടി ജില്ലാ പഞ്ചായത്ത് പിന്തുണാസാമഗ്രി തയ്യാറാക്കുന്നത്. പ്രധാനപ്പെട്ട ആറ് വിഷയങ്ങളിലാണ് ഈ വർഷം തയ്യാറാക്കുന്നതെങ്കിലും അടുത്തവർഷം മറ്റു വിഷയങ്ങളിലും കുട്ടികൾക്ക് പിന്തുണ നൽകാൻ കഴിയുമെന്ന് പ്രതീക്ഷിക്കുന്നു. കുട്ടികളുടെ അക്കാദമിക മികവ് ഉറപ്പുവരുത്തിക്കൊണ്ട് മികച്ച ഗ്രേഡുകൾ നേടാൻ അവരെ സജ്ജമാക്കാൻ '**എക്വിപ് 2024**' എന്ന പേരിൽ തയ്യാറാക്കിയ ഈ പദ്ധതിക്ക് കഴിയട്ടെയെന്ന് ആശംസിക്കുന്നു.

സ്നേഹപൂർവ്വം

അഡ്വ. സരിത എസ്.എൻ.
ആരോഗ്യ-വിദ്യാഭ്യാസ സ്ഥിരം സമിതി
അധ്യക്ഷ, ജില്ലാ പഞ്ചായത്ത്,
കാസർകോട്

ആശംസ

ജില്ലയിലെ അക്കാദമിക പ്രവർത്തനങ്ങളെ ഏകോപിപ്പിച്ച് മുന്നോട്ട് നയിക്കുന്ന ഉത്തരവാദിത്തമാണല്ലോ ജില്ലാ വിദ്യാഭ്യാസ പരിശീലന കേന്ദ്രങ്ങൾ (DIET) കാലങ്ങളായി ചെയ്തുവരുന്നത്. മനുഷ്യവിഭവശേഷിയിൽ പരിമിതികൾ ഉള്ളപ്പോൾ തന്നെ പ്രീ-പ്രൈമറി തലം മുതൽ ഹയർ സെക്കൻഡറി തലം വരെയുള്ള മേഖലകളിൽ വിവിധങ്ങളായ പദ്ധതികൾ ആസൂത്രണം ചെയ്യാനും നിർവഹിക്കാനും ഡയറ്റുകൾക്ക് ഇതുവരെ കഴിഞ്ഞിട്ടുണ്ട്. ഡയറ്റ് കാസർകോടിന്റെ നേതൃത്വത്തിൽ പത്താം തരത്തിലെ കുട്ടികളുടെ പഠനപ്രശ്നങ്ങൾ മറികടക്കാൻ കഴിഞ്ഞ കുറച്ച് വർഷങ്ങളായി വിദ്യാഭ്യാസ വകുപ്പ് നടപ്പിലാക്കുന്ന പദ്ധതിയാണ് **EQUIP (Educational Quality Improvement Programme).** അതതു വർഷത്തെ കുട്ടികളുടെ പഠനപ്രശ്നങ്ങൾ പരിഗണിച്ചുകൊണ്ടാണ് പ്രവർത്തനങ്ങൾ ചിട്ടപ്പെടുത്തുന്നത്. ഈ പദ്ധതിയുടെ ഭാഗമായി പത്താംതരത്തിലെയും പ്ലസ്ടുവിലെയും പരീക്ഷയെ അഭിമുഖീകരിക്കാൻ കുട്ടികളെ സഹായിക്കുന്ന വിവിധ വിഷയബന്ധിതമായ ചോദ്യമാതൃകകൾ യൂണിറ്റടിസ്ഥാനത്തിൽ പരിചയപ്പെടുത്താനാണ് ഉദ്ദേശിക്കുന്നത്. ജില്ലാ പഞ്ചായത്തിന്റെ സഹായത്തോടെ മലയാളത്തിലും ഇംഗ്ലീഷിലും കന്നഡയിലും പത്താംതരത്തിൽ ഐ.ടി. ഒഴിച്ചുള്ള എല്ലാ വിഷയങ്ങളിലും പ്ലസ്ടുവിൽ പ്രയാസകരമായ ആറ് വിഷയങ്ങളിലും പുസ്തകങ്ങൾ തയ്യാറാക്കി നൽകാനാണ് ഉദ്ദേശിക്കുന്നത്. ഈ അധ്യയന വർഷം പത്താംതരം/പ്ലസ്ടു പരീക്ഷ എഴുതുന്ന മുഴുവൻ കുട്ടികൾക്കും ഈ പദ്ധതിയുടെ പ്രയോജനം ലഭിക്കുമെന്ന് പ്രതീക്ഷിക്കുന്നു. വ്യത്യസ്ത പഠനവേഗതയും പഠനമികവുമുള്ള എല്ലാ വിഭാഗം കുട്ടികൾക്കും ഈ സാമഗ്രി പ്രയോജനപ്പെടട്ടെ എന്ന് ആശംസിക്കുന്നു. അധ്യാപകരുടെ ആത്മാർത്ഥമായ പിന്തുണയും പ്രോത്സാഹനവും അനിവാര്യമായ ഈ ഉദ്യമത്തിൽ എല്ലാവരുടെയും സഹായ സഹകരണങ്ങൾ പ്രതീക്ഷിച്ചുകൊണ്ട് ഏവർക്കും വിജയാശംസകൾ നേരുന്നു.

ആശംസകളോടെ,

ഡോ. രഘുരാമ ഭട്ട് കെ.
പ്രിൻസിപ്പാൾ
ഡയറ്റ് കാസർകോട്

ആമുഖം

കാസർകോട് ജില്ലാ പഞ്ചായത്തിന്റെ നേതൃത്വത്തിൽ ജില്ലയിലെ പൊതുവിദ്യാഭ്യാസം ശക്തിപ്പെടുത്തുന്നതിന് വ്യത്യസ്തങ്ങളായ നിരവധി പ്രവർത്തനങ്ങൾ നടന്നുവരികയാണ്. അതേസമയം ദേശീയ-സംസ്ഥാന പഠനങ്ങൾ നമ്മുടെ ജില്ലയിലെ കുട്ടികളുടെ പ്രകടനം ഇനിയും മെച്ചപ്പെടേണ്ടതുണ്ട് എന്ന സൂചനയാണ് നൽകുന്നത്. ഈ പശ്ചാത്തലത്തിലാണ് ജില്ലയിലെ പൊതുവിദ്യാലയങ്ങളിൽ നിന്ന് 2023-24 അധ്യയനവർഷം എസ്.എസ്.എൽ.സി., പ്ലസ്ടു പരീക്ഷകൾ അഭിമുഖീകരിക്കുന്ന കുട്ടികൾക്ക് പഠനപിന്തുണ നൽകുന്നതിന് ജില്ലാ പഞ്ചായത്തിന്റെയും പൊതുവിദ്യാഭ്യാസ വകുപ്പിന്റെയും സംയുക്താഭിമുഖ്യത്തിൽ വ്യത്യസ്ത വിഷയങ്ങളിൽ പഠനസാമഗ്രികൾ തയ്യാറാക്കേണ്ടതിന്റെ ആവശ്യകത ജില്ലാതല ഉന്നതാധികാര യോഗങ്ങളിൽ ചർച്ചചെയ്യപ്പെട്ടത്. ഇതിന്റെ അടിസ്ഥാനത്തിൽ ഡയറ്റ് കാസർകോടിന്റെ അക്കാദമിക നേതൃത്വത്തിൽ ജില്ലയിലെ മികച്ച അധ്യാപകരെ ഉൾപ്പെടുത്തിക്കൊണ്ട് പത്താംതരത്തിൽ ഐ.ടി. ഒഴിച്ചുള്ള എല്ലാ വിഷയങ്ങളിലും പ്ലസ്ടുവിൽ ഏറ്റവും പ്രയാസമേറിയ ആറ് വിഷയങ്ങളിലും (ഗണിതം, ഫിസിക്സ്, കെമിസ്ട്രി, ഇംഗ്ലീഷ്, അക്കൗണ്ടൻസി, ഇക്കണോമിക്സ്) പഠനപിന്തുണാസാമഗ്രികൾ തയ്യാറാക്കിയിരിക്കുക യാണ്. സ്കൂൾ വിദ്യാഭ്യാസം പൂർത്തീകരിച്ച് ഉന്നത വിദ്യാഭ്യാസമേഖലയിലേക്ക് പ്രവേശിക്കുന്ന പ്ലസ്ടു വിദ്യാർത്ഥികൾക്ക് പഠനപിന്തുണ നൽകുന്ന സാമഗ്രി ജില്ലയിൽ ആദ്യമായാണ് തയ്യാറാക്കുന്നത്. ജില്ലയിൽ നിന്നും പൊതുപരീക്ഷയെ അഭിമുഖീകരിക്കുന്ന മുഴുവൻ എസ്.എസ്.എൽ.സി, പ്ലസ്ടു വിദ്യാർത്ഥികൾക്കും ആത്മവിശ്വാസം വളർത്തുന്നതിനും ഉന്നതവിജയം നേടുന്നതിനും ഈ ഉദ്യമം സഹായകമാകട്ടെയെന്ന് ആത്മാർത്ഥമായി ആഗ്രഹിക്കുന്നു. ഈ പദ്ധതിയെ നെഞ്ചേറ്റിയ പ്രിയപ്പെട്ട അധ്യാപക സുഹൃത്തുക്കൾക്ക് ഈ പുസ്തകത്തെ ഫലപ്രദമായി ഉപയോഗിക്കാൻ കഴിയട്ടെ. എല്ലാവർക്കും വിജയാശംസകൾ.

ശ്രീ. എൻ. നന്ദികേശൻ
ജില്ലാ വിദ്യാഭ്യാസ ഉപഡയറക്ടർ
കാസർകോട്

CHEMISTRY

SSLC - English Medium

Unit - 1

ELEMENT, ATOMIC NUMBER, SUBSHELL AND ELECTRONIC CONFIGURATION

Worksheet 1 :

1. Complete the Table related to the atomic structure.

Shell No	Name of the Shell	Total number of Subshell	Name of the Subshell	Maximum number of electronics that can be accomodated in sub shells
1	K	1	-	s-2
2	-	-	-	-
3	-	-	3s, 3p, 3d	-
4	-	-	-	-

Worksheet 2 :

2. Complete the table and answer the following questions.

Element	Atomic Number	Subshell	Electronic configuration	Block	Period	Group	Valency	Metal/Non Metal
$^{23}_{11}A$								
$^{16}_{8}B$								
$^{27}_{13}C$								
$^{35}_{17}D$								

* Write the molecular formula of a compound formed by any one of these metals and non-metals from the given table.

Work sheet 3 :

3. Some characteristics of elements are given below. Arrange them suitably in appropriate blocks.
   (a) Largest atoms in each period.
   (b) All are metals
   (c) Valence electrons are filled in the penultimate shell
   (d) Ionisation energy is less
   (e) Metalloids and Inert gases are found
   (f) These elements have less electro negetivity
   (g) Produce coloured compounds
   (h) Exhibits different oxidation states

Work sheet 4 :

Incomplete portion of a periodic table is given below. Observe and answer the following questions. (Symbols are not real)

												G			I	D	E
A															H		
					B				C								
	F																

(a) Which is an inert gas?
(b) Which elements exhibit different valancies?
(c) Which are metals?
(d) Which element has valency 3?
(e) Which element has +2 oxidation state?
(f) Which is the highly reactive non metal?
(g) Which element has highest ionisation energy?
(i) Which is highly reactive metal?
(j) Which element has -2 oxidation state?
(k) Write the molecular formula of a compound formed between I and F.

Unit - 2

GAS LAWS AND MOLE CONCEPT

Work sheet 1 :

1. Some statements related to the physical properties of two states of matter are given below.
   (a) Inter molecular space is less.
   (b) Attractive force between the molecules is comparitively less.
   (c) During collision of molecules energy loss is not happening.
   (d) Ability of molecules to move is comparatively less.
   (e) Ability of molecules to move is high.
   (f) Attractive force between the molecules is very less.
   (g) Kinetic energy of the molecules is less.
   (h) Kinetic energy of the molecules is very high.

Liquid	Gas

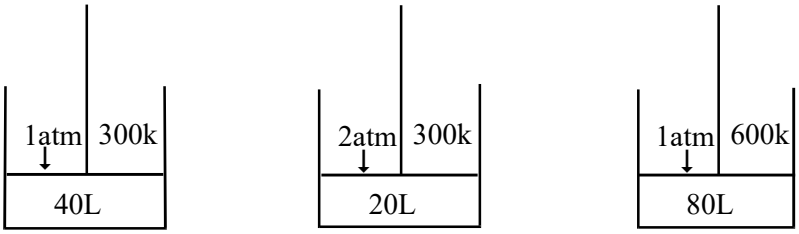
Work sheet 2

2. Some observations are given. Tabulate them.
   (a) Size of air bubbles increases while rising up in the aquarium.
   (b) Inflated balloon burst out in sun light.
   (c) Volume of inflated balloon increases while rising up in the air.
   (d) Volume of balloon increases while blowing air into it.
   (e) Vehicle tyres are partially filled during summer.

Statement	Related Gas Law	Mathematical Expression of the law

Activity 3

3. a) Different stages of a reaction of an experiment by using a gas is given in pictures. Analyse the pictures and complete the table. And also state the Gas law related to it.



Pressure	Volume	PV
1	40	(a)
2	(b)	(c)
3	-	40

b) Which stages are to be configured to state Charl's law? Justify your answer.

Worksheet 4 :

4. Complete the Table.

Element	Atomic Mass	GAM	Molecular formula	Molecular Mass	GMM
N	14	-	-	-	-
O	-	-	O_2	32	-
Ne	-	20g	-	-	20g

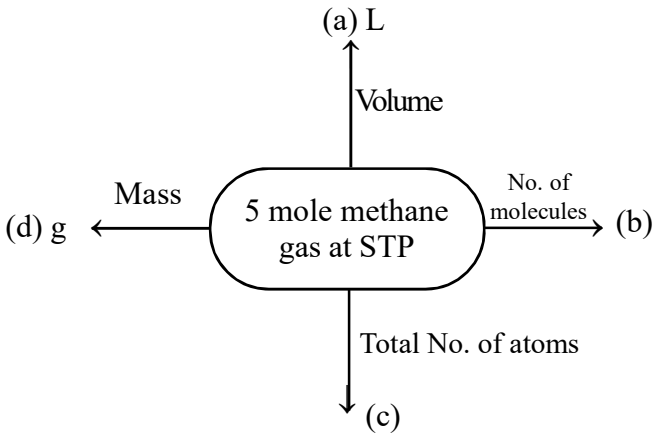
Work sheet 5 :

5. Complete the following table.
[Hint: Atomic mass of C = 12, O = 16, Ca = 40, H = 1, Cl = 35.5]

Substance	MM	GMM	Mass of the given sample	No. of moles	No. of molecules	Total No of atoms	Volume at STP
CO_2			88				
$CaCO_3$				5			NA
H_2O					$8 \times 6.022 \times 10^{23}$		NA
C_4H_{10}			290				
Cl_2						$10\ N_A$	

Work sheet 6

6. Complete the word web : [Hint : Methane CH_4]

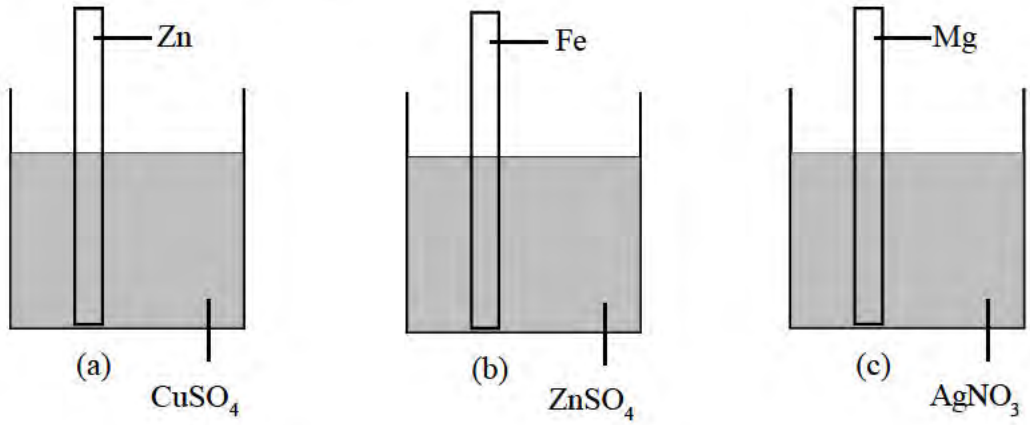


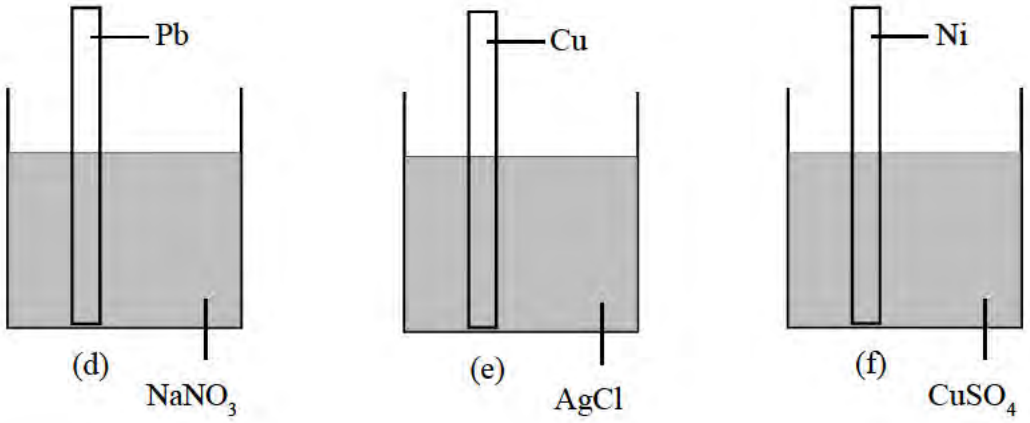
Unit - 3

REACTIVITY SERIES AND ELECTROCHEMISTRY

Worksheet 1 :

1. Analyse the given diagrams and complete the table.





Hint: Valency of Ni is 2.

No	Highly reactive	Less reactive	Reaction takes place Yes/No	Oxidation	Reduction	Oxidation Reaction	Reduction Reaction
a	Zn	Cu	Yes	Zn	Cu	$Zn \rightarrow Zn^{2+}+2e$	$Cu_2^{+}+2e \rightarrow Cu$
b							
c							
d							
e							
f							

Worksheet 2 :

2. Tabulate the following reactions.

(a) $Mg \rightarrow Mg^{2+} + 2e$

(b) $Na^{+} + 1e^{-} \rightarrow Na$

(c) $2Cl \rightarrow Cl_2 + 2e$

(d) $Al \rightarrow Al^{3+} + 3e$

(e) $O + 2e \rightarrow O^{2-}$

(f) $2O^{2-} \rightarrow O_2 + 4e$

Oxidation	Reduction

Worksheet 3 :

2. Some pairs of elements are given. Identify the anodes, cathodes, corresponding reaction of cells constructed using these pairs.

(a) Mg/Al

(b) Zn/Fe

(c) Sn/Pb

(d) Ag/Cu

(e) Pb/Ni

(f) Sn/Zn

[Hint : Valency of Al -3, Mg - 2, Zn - 2, Fe - 2, Sn - 2, Pb - 2, Ag - 1, Cu - 2, Ni - 2)]

No	Cathode	Anode	Reaction at Cathode	Reaction at Anode
a	Al	Mg	$Al^{3+} + 3e \rightarrow Al$	$Mg \rightarrow Mg^{2+} + 2e$
b				
c				
d				
e				
f				

Worksheet 4 :

4. Process of deposition of a desired metal on another material based on electrolysis is known as Electroplating. Some electroplating process are given. Analyse the process and complete the table.

No.	Electroplating Process	Cathode	Anode	Electrolyte
1	Copper coating on Iron bangle		Iron bangle	
2	Gold coating on copper bangle	Gold		
3	Silver coating on Iron vessel			

Worksheet 5 :

5. Complete the following table.

[Hint: Electrolysis of some compounds]

Electrolyte	Ion reached at cathode	Ion reached at anode	Reaction at cathode	Reaction at anode	Product at cathode	Product at anode
Molten NaCl	Na^+					
Aqueous solution of NaCl						
Molten Al_2O_3			$2Al+6e \rightarrow 2Al$			
Aqueous solution of KCl						
Molten KCl						

Unit - 4

PRODUCTION OF METALS

Work sheet 1 :

1. Molecular formulae of some ores are given. Complete the table.

(a) $Al_2O_32H_2O$

(b) Fe_2O_3

(c) Fe_3O_4

(d) $CuFeS_2$

(e) Cu_2O

(f) $ZnCO_3$

Molecular formula of the ore	Chemical name of the ore	Metal that can be extracted from the ore	Category of the ore
a) $Al_2O_32H_2O$	-	-	Hydrated oxide
b) -	-	-	-
c) -	-	-	-
d) $CuFeS_2$	-	-	Sulphide
e) -	-	-	-
f) -	-	-	-

Work sheet 2 :

2. An incomplete table related to the concentration of the ores is given. Fill in the blanks.

Method of concentration of ore	Characteristics of the ore	Characteristics of the impurity	Nature of the ore	Example
Lavigation/ Hydraulic washing	a	Low density	b	Fe_2O_3
c	Low density	d	Sulphide	e
Magnetic separation	f	g	h	Fe_3O_4
i	j	Insoluble in solvent	k	l
m	Non magnetic character of the ore	n	o	SnO_2

Work sheet 3 :

3. Categorise the following statements.
   (a) Heating in the absence of air.
   (b) Heating in the presence of air.
   (c) Carbonates become oxides
   (d) Salphides become oxides

Calcination	Roasting

Work sheet 4 :

4. An incomplete table related to the purification of metals is given. Fill in the blanks.

Method	Nature of the metal	Purifying metals
Liquation	a	b
c	low boiling point	d
e	conductivity of electricity	f

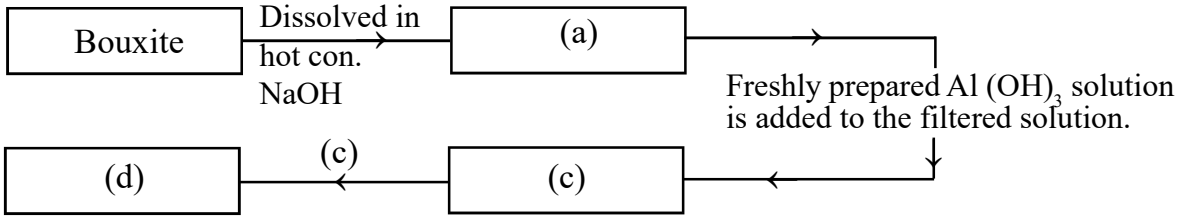
Work sheet 5 :

5. Complete the table.

Alloys	Constituent element	Nature	Uses
Stainless steel	-	-	Making utensils
-	-	Magnetic nature	-
-	Fe, Ni, Cr, C	-	-

Work sheet 6 :

6. A flow chart related to the purification of Aluminium metal is given. Fill in the blanks.



Work sheet 7 :

7. Some chemical equations related to the extraction of iron from haematite in a blast furnace is given. Match them properly.

(a) $CO_2 + C \rightarrow 2CO$ - Reduction reaction

(b) $CaCO_3 \rightarrow CaO + CO_2$ - Slag formation

(c) $Fe_2O_3 + 3CO \rightarrow 2Fe + 3CO_2$ - Flex formation

(d) $CaO + SiO_2 \rightarrow CaSiO_3$ - Reducing agent formation

Unit - 5

COMPOUNDS OF NON METALS

Work sheet 1 :

1. Complete the table related to the laboratory preparation of ammonia.
   NH_4Cl, $Ca(OH)_2$, $CaCl_2$, H_2O, NH_3, CaO, Red Litmus, Blue Litmus, Con. HCl

Reactants	Product	Dehydrating agent	Litmus Test	Dense white fumes

Worksheet 2 :

2. Identify the forward reaction and backword reaction from the following equations.

   (a) $NH_4Cl \rightleftharpoons NH_3 + HCl$

   (b) $2SO_2 + O_2 \rightleftharpoons 2SO_3$

   (c) $H_2 + I_2 \rightleftharpoons 2HI$

   (d) $N_2 + 3H_2 \rightleftharpoons 2NH_3$

Forward Reaction	Backward Reaction
(a) $NH_4Cl \rightarrow NH_3 + HCl$	$NH_3 + HCl \rightarrow NH_4Cl$
(b) -	-
(c) -	-
(d) -	-

Worksheet 3 :

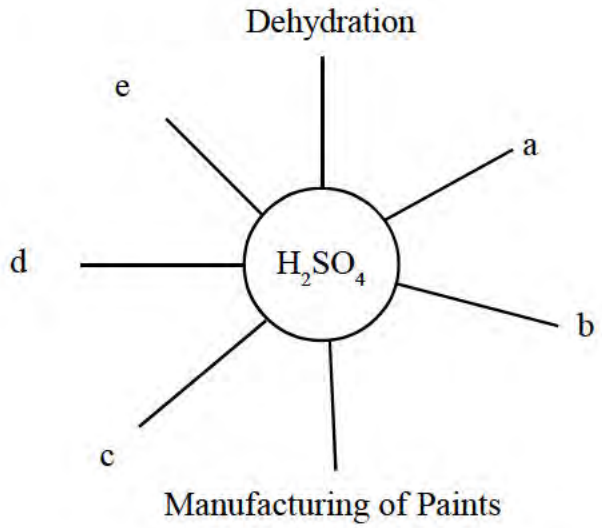
3. A chemical equilibrium consists of gases is given below. Observe and complete the table.

$N_{2(g)} + 3H_{2(g)} \rightleftharpoons 2NH_{3(g)} + \text{Heat}$

Process	Changes in the system	Reaction by the system	Resultant
a) Adding more N_2	-	-	-
b) -	Increasing the concentration of reactant	-	-
c) Removing NH_3	-	Increasing the amount NH_3 temperature	-
d) -	-	Increasing the temperature	Increasing the speed of forward reaction
e) Increasing the temperature	-	-	-
f) -	Increasing the number of molecules	-	-
g) Increasing pressure	-	-	-

Worksheet 4 :

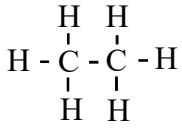
4. Complete the word web.



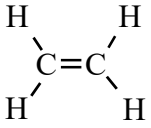
UNIT - 6

NOMENCLATURE OF ORGANIC COMPOUNDS AND ISOMERISM

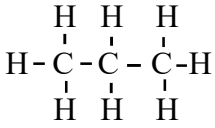
1. Hydrocarbons are organic compunds formed when the atoms of carbon and hydrogen alone are combined. Consider the structure of some hydrocarbons.



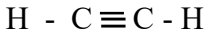
(a)



(b)



(c)



(d)

   1) Which are unsaturated compunds?

   2) Write the condensed formula of the compound (c).

   3) Which of the above compounds are the successive members of a homologus series? Justify your answer.

   4) What is the general formula of the homologus series in which the compound (b) includes?

   5) Classify the given compounds in the Alkane, Alkene and Alkyne.

2. These are 4 carbon atoms in a saturated hydrocarbon molecule.

   1) Give the chemical formula of the compound.

   2) Write the structure and IUPAC name of two isomers those can be represented by the above molecular formula.

   3) What kind of isomerism is observed here? (Chain isomerism, Position isomerism, Functional group isomerism)

3. Consider the molecular formula C_3H_6.

   1) If this molecular formula represents a structured

5. 5 mole Methane gas at STP

(a) L Volume

1) It is an unsaturated hydrocarbon.

2) It is a saturated hydrocarbon.

3) Different position isomers are possible for this molecular formula.

4) Chain isomerism is possible for this molecule.

5) This is an Alkane.

6) This is an Alkyne.

7) This molecular formula is possible for an open chain (aliphatic) compound as well as a cyclic compound.

8) Write the structure and IUPAC name of all isomers represented by the molecular formula C_5H_{12}. Identify the type of isomerism observed here.

6. Write the condensed formula of the compounds with the following IUPAC names.

1) 2, 4 - dimethyl heptane

2) cyclobutane

3) 2, 3 - Dichloro pentane

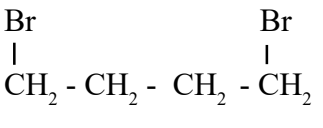
4) propan - 2-ol

5) pent - 2 -yne

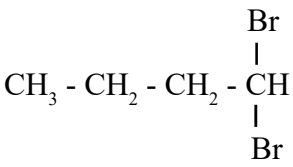
6) butanoic acid

7) ethoxy propane

7. Consider the given Holo compounds.



(a)



(b)

1) Which one of the above compund is 1, 1-Dichloro butane?

2) Give the IUPAC name of the other compound.

3) Compound (a) and compound (b) are (Chain isomers, Position isomers, Functional group isomers)

8. Consider the molecular C_3H_8O.

1) Is this a hydrocarbon molecule? (Yes/No)

2) Write the structure and IUPAC name of two functional group isomers which can be represented by the given molecular formula.

3) Give the structure and IUPAC name of two position isomers with the above molecular formula.

9. a) Write the IUPAC name of the following organic compounds.

1) $CH_3 - CH_2 - CH_2 - CH_2 - CH_3$

2) $CH_3 - CH_2 - CH_2 - O - CH_2 - CH_3$

3) $CH_3 - CH_2 - CH = CH - CH_3$

4) $CH_3 - CH_2 - CH_2 - CH_2 - CH_2 - OH$

5) $CH_3 - CH_2 - CH_2 - \underset{\displaystyle CH_3}{\underset{|}{CH}} - CH_3$

6) $CH_3 - CH_2 - \underset{\displaystyle CH_3}{\underset{|}{CH}} - CH_3$

7) $CH_3 - CH_2 - CH_2 - CH = CH_2$

b) Identify two compunds each being isomers and constitute isomeric pairs. Mention the type of isomerism exhibited by each pair.

10. Consider the compund $CH_3-CH_2-\underset{\displaystyle CH_3}{\overset{\displaystyle |}{CH}}-OH$

1) Write the IUPAC name of this compund.

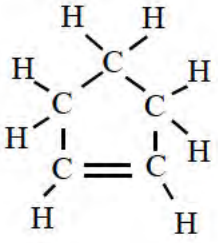
2) Write the structure and IUPAC name of a position isomer of the given compund.

3) Which is the functional group that can be included in the functional group isomer of the above compund?

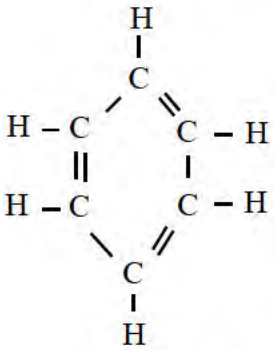
(Carboxylic, alkoxy, halo)

4) Give the structure and IUPAC name of a functional group isomer of the given compound.

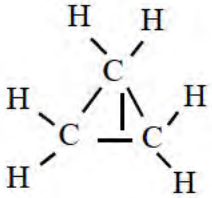
11.



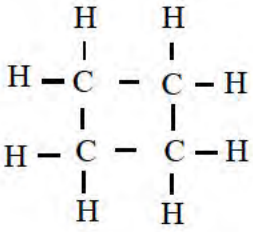
Compund 1



Compund 2



Compund 3



Compund 4

a) Which among the above is an isomeric compound? Give name and molecular formula.

b) What is the IUPAC name of compund 1?

c) Examine whether compund 3 and 4 are two successive members of a homologus series.

12. $CH_3 - CH_2 - CH - CH_3$

$$\begin{array}{l} CH_3 - CH_2 - \underset{|}{C}H - CH_3 \\ \qquad\quad\; CH_3 - CH - CH_3 \end{array}$$

Is the condensed formula of a compound

1) What is the number of carbon atoms in the main chain?

2) How many branches are there? Name the branch.

3) Give the IUPAC name of the compound.

UNIT - 7

CHEMICAL REACTIONS OF ORGANIC COMPUNDS

1. Consider the chemical reaction of ethene with hydrogen in the presence of Nickel (Ni) catalyst at high temperature.

   a) Write the chemical equation of this reaction.

   b) This chemical reaction belongs to the category of (Polymerisation, Substitution reaction, Addition reaction, Fermentation)

   c) This reaction is possible because the reactant here, ethene, is a - compound. (Saturated/Unsaturated)

2. Consider some carbocyclic acids namely palmitic acid, acetic acid, oleic acid and stearic acid.

   1. Which of the above is not a fatty acid?

   2) To which alcohol do fatty acids combine to form esters such as fats and oils?

3. Choose the correct form from the list given below that properly matches the compound given in coloumn A and write in coloumn B to complete the table.

A	B
CH_2=CHCl	
CH_3-COOH	
CH_3-OH	
CH_3-CH_2-OH	

(Methanoic acid, Wood spirit, Vinyl Chloride, Acetic acid, Grape spirit)

4. Consider the following chemical reactions.

Reaction 1 :

$$CH_3 - CH_2 - CH_2 - CH_2 - CH_2 - CH_2 - CH_3 \xrightarrow{\text{heat}} CH_3 - CH_2 - CH_2 - CH_3 + \quad \text{.....(A)}$$

Reaction 2 :

(A) + Cl_2..... (B)

a) Write the structure and IUPAC name of compound (A) and (B)

b) To which category of reactions ..... reaction - 2 belongs?

(Thermal cracking, Substitution reaction, Addition reaction, Polymerisation)

c) Write the structure and IUPAC name of a position isomer of the compound. (B)

d) Compound ..... is an unsaturated compound

(A/B)

5. You are familiar with combustion of hydrocarbons.

a) This kind of reactions are .....

(endothermic reactions/exothermic reaction)

b) What are the products obtained during the combustion of hydrocarbons?

c) Which hydrocarbon is the important component in the domestic fuel LPG?

d) Write the balanced chemical equation for the combustion of this compound.

6. Properly match the items given in coloumn A & B.

A	**B**
Oils	Main component in LPG
Teflon	Vinegar
Soap	Enzyme
Butane	Polymer
Invertase	Ester
Ethamoic acid	Salt

7. Consider the organic compund namely Ethyl propanoate.

1) The given compound includes in the category of (alcohols, ether, ester, carboxylic acid)

2) Write the condensed formula of this compound.

3) Name the reactant required to prepare this compound.

4) Write the chemical equation for the preparation of this compound from the above reactant.

8. Consider the chemical equation for an organic reaction.

$$n\ CF_2 = CF_2 \rightarrow \left[CF_2 - CF_2\right]_n$$

1) This reaction is an example for (Addition reaction, Polymerisation, Esterifraction, Substitution reaction)

2) Name the product obtained in the given chemical reaction

3) Give one use of the product obtained.

4) Which is the monomer of polythene?

9. Consider the chemical equation.

$$CH_3 - CH_2 - CH_2 - CH_2 - CH_2 - CH_3 \xrightarrow{heat} CH_3 - CH_2 - CH_3 + CH_2 = CH - CH_3$$

a) This reaction ia an example of (Combustion, Thermal cracking, Polymerisation)

b) If the same reactants are subjected to the same type of reaction in a different environment one of the products obtained is butane. Identify the other product.

c) In the chemical reaction consider first and the reaction mentioned in ..... (b), products are different. What are the factors influencing the formation of products obtained as a result of these kind of chemical reaction.

Unit - 1

PERIODIC TABLE AND ELECTRONIC CONFIGURATION

1 - 13 ; 1 mark questions.

1. Find the relationship of the first pair and fill in the blanks.

   S : 2

   d : .....

2. When the distance increases from the nucleus, energy of the electrones will .....

3. Find the relationship of the first pair and fill in the blanks.

   L: 2

   N : .....

4. Which of the following shell has more energy?

   2s, 2p, 3s

5. Arrange the following subshells in the increasing order of their energy.

   3p, 2p, 3s, 4s, 3d, 2s

6. Which is the noble gas element comes immediately before Na?

7. Subshell electronic configuration of an element is $1s^2\ 2s^2\ 2p^6\ 3s^1$. Find its period number.

8. Subshell electronic configurationof an element is $1s^2\ 2s^2\ 2p^6\ 3s^2$. Find its group number.

9. Atomic number of an atom is 5. What is its group number?

10. Transition elements belongs to which block?

11. Find the oxidation state of Mn in MnO_2.

12. Write the name of a coloured compound.

13. Radio active elements belongs to which block?

14 - 16 ; 2 mark questions.

14. Atomic number of potassium is 19. Write its shell and subshell electronic configuration.

15. Write the subshell electronic configuration of the following elements.

    (a) $_{22}Ti$ (b) $_{23}V$

16. Write the electronic configuration of the following elements with inert gas element.

    (a) $_{20}Ca$ (b) $_{12}Mg$

17 ; 3 mark questions.

17. Write the subshell electronic configuration of the following elements and find their group, block and period.

    (a) M - 27 (b) N - 19 (c) P - 15

18 - 19 ; 4 mark questions.

18. Analyse the electronic configuration and answer the following questions. [Symbols are not real)

    A → [Ne] $3s^2$ $3p^2$

    B → [Ne] $3s^2$

    C → [Ar] $4s^1$

    D → [Ar] $4s^2$ $3d^2$

    (a) Which is the most electronegetive element?

    (b) Which element exhibits different oxidation state?

    (c) How many p - electrons are there in C?

    (d) Which element have the least ionisation energy?

19. Match the following.

(a) $1s^2$ $2s^2$ $2p^6$ $3s^2$ $3p^5$	● Exhibits different oxidation state
(b) $1s^2$ $2s^2$ $2p^6$	● Highly reactive metal
(c) $1s^2$ $2s^1$	● Ionisation energy is high
(d) $1s^2$ $2s^2$ $2p^6$ $3s^2$ $3p^6$ $3d^5$ $4s^2$	● Non metal

Answers : Unit - 1

1. 10
2. Increases
3. 4
4. 3s
5. 2s < 2p < 3s < 3p < 4s < 3d
6. Neon (Ne)
7. 2

8. 2
9. 13
10. d - block
11. 4
12. Copper sulphate, Potassium Permanganate, Cobalt Nitrate, Ferrous Sulphate (Any one)
13. f - block

14. Shell configuration :

K	L	M	N
2	8	8	1

Subshell electronic configuration : $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^6\ 4s^1$

15. a) $_{22}Ti \rightarrow 1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^6\ 3d^2\ 4s^2$

b) $_{23}V \rightarrow 1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^6\ 3d^3\ 4s^2$

16. a) $_{20}Ca \rightarrow$ [Ar] $4s^2$

b) $_{12}Mg \rightarrow$ [Ne] $3s^2$

17. a) $_{29}Cu \rightarrow 1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^6\ 3d^{10}\ 4s^1$

b) $Cu^{2+} \rightarrow 1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^5\ 3d^9$

b) When Cu react with chlorine to form 2 types of compounds. Cu^+, Cu^{2+} ions react with chlorine to form Cucl & $CuCl_2$.

18. a) +5

b) V^{5+}

c) $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^6$

19. a) $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^6\ 3d^7\ 4s^2$

Block : d

Group : 9

Period : 4

b) $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^6\ 4s^1$

Block : s

Group : 1

Period : 4

c) $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^3$

Block : p

Group : 15

Period : 3

20. a) A

b) D

c) 12

d) c

21. a) → iv

b) → iii

c) → ii

d) → i

Unit - 2

GAS LAWS AND MOLE CONCEPT

1 - 13 ; 1 mark questions.

1. Movement spead of gas particle is very ..... [less/high]
2. Who discovered the relationship between the number of gas molecules and its volume?
3. How many atoms are present in 12g carbon?
4. In STP 22.4L gas = ...
5. Arrange the following in the increasing order of their moles. [Hint: Molecular mass of H_2O = 18, CH_4 = 16, $CaCO_3$ = 100, SO_2 = 64]
6. Transportation and the distribution of gas in cylinder is very easy. Which gas law is based on this?
7. Calculate the molecular mass of the given compounds.

   (a) $Ca(NO_3)_2$ b) $C_{12}H_{22}O_{11}$

   [Hint: Atomic mass of Ca = 40, N = 14, O = 16, H = 1]
8. Reaction between NaOH and HCl is given.

   NaOH + HCl → NaCl + H2O

   a) In this reaction how many HCl moles are required to react 1 mole of NaOH completely?

   b) How much gram of Hcl is needed to neutralise 160g of NaOH?
9. Mathematical expression of gas laws are given below. Identify each Law.

   a) $V \alpha T$

   b) $V \alpha {}^{1}/_{P}$
10. How many moles of chlorine is present in 11.2 L chlorine gas at STP. And also calculate its weight.

11. GAM of Hydrogen is 1g.

    a) How many atoms are present in 1g Hydrogen.

    b) What is the mass of 1 Hydrogen atom.

12. Molecular formula of ammonia is NH_3. [Atomic mass of N=1, H=1]

    a) Calculate the molecular mass of ammonia.

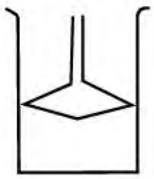
    b) How many moles are present in 1g of ammonia.

13. State molar volume. What is the molar volume of a gas at STP?

14. Calculate the number of atoms and the STP volume of 368g NO_2.

    [Hint: Atomic mass of N=14, O=16)

15. A piston connected cylinder is filled with CO_2 gas. Then it to dip in hot water.



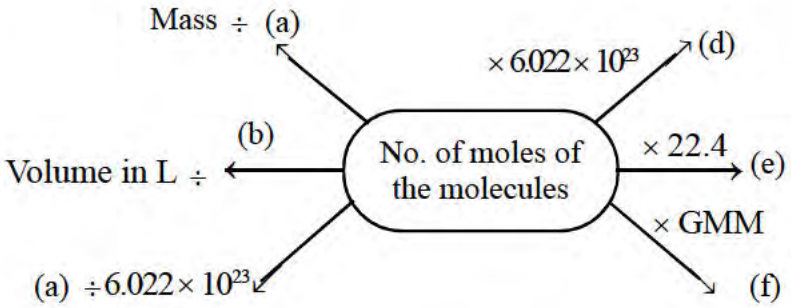
    a) What will be the change in the speed of CO_2 molecules?

    b) What will be the change in the position of piston?

    c) What is the relationship between the temparature and the volume of a gas?

    d) State the gas law which deals with the relationship between temparatute and volume.

16. Complete the word web.



Answers : Unit - 2

1. High
2. Avagadro
3. 6.022×10^{23} Atoms
4. 1 mole
5. a=5, b=3, c=1, d=15

   100g $CaCO_3$ < 96g SO_2 < 48g CH_4 < 90g H_2O
6. Boyles law
7. a) 164

   b) 342
8. a) 1

   b) 146g

9. a) Charles law

   b) Boyles law

10. No. of moles of 11.2L chlorine gas $\frac{11.2}{22.4}$ = 2 mole

    Mass of 0.5 mole chlorine = 0.5x35.5 = 17.759g

11. a) 1g Hydrogen = 6.022×10^{23} Atoms

    b) Mass of 1 Hydrogen atom = $\frac{1g}{6.022 \times 1023} = 1.66 \times 10^{-24}$g

12. a) Molecular mass = (1x14) + (3x1) = 17

    b) Number of moles = $\frac{51}{17}$ = 3 moles

13. Volume of 1 mole gas is known as molar volume. Molar volume at STP is 22.4L.

14. a) GMM of NO_2 = 14 + (2x16) = 46g

    No. of moles of molecules = $\frac{368}{46}$ = 8moles

    No. of molecules = No. of mole of the molecules x Av

    = $8 \times 6.022 \times 10^{23}$

    $\therefore$ No. of atoms = No. of atoms in 1 molecule x No. of molecular

    = $3 \times 8 \times 6.022 \times 10^{23}$

    = $24 \times 6.022 \times 10^{23}$

    b) Volume of STP = No. of mole of the molecules x 22.4L

    = 8x22.4L = 179.2L

15. a) When Temperature increases energy of the gas particle is also increases. This will leads to the increase in the speed of gas molecules.

    b) Piston will pushed upwards. Thus its position will changed.

    c) When Temperature increases volume is also increases.

    d) Charles law (statement)

16. a) GMM

    b) 22.4L

    c) No. of molecules

    d) No. of molecules

    e) Volume in litres

17. Atomic number of copper is 29. When it is take part in a chemical reaction Cu become Cu^{2+} ion.

    (a) Write the subshell electronic configuration of Cu^{2+} ion.

    (b) Write the molecular formula the compound when Cu react with chlorine.

18. The compound of vanadium is V_2O_5. It is used as a catalyst.

    (a) What is the oxidation state of vanadium in V_2O_5?

    (b) Write the representation of vanadium ion.

    (c) Write subshell electronic configuration of vanadium ion.

Unit - 3

REACTIVITY SERIES AND ELECTROCHEMISTRY

1. Which of the following metal is not react with water?

   Na, Mg, Cu
2. Negatively changed ions attached to which electrode?
3. In electroplating, the desired metal which we need to electroplate on another material is taken as which electrode?
4. In the electroplating of Gold which compound is taken as an electrolyte?
5. When metals react with acids, which gas is produced?
6. Which of the following metal is do not displace Hydrogen while reacting with acids?
7. In the displacement reaction, highly reactive metal undergoes which reaction?
8. Write the energy change in the Galvanic cell.
9. Reduction reaction takes place in which electrode?
10. Write the working function of salt bridge in Galvanic cell.
11. Complete the following reaction.

    a) $Zn \rightarrow Zn^{2+}$ = ...

    b) ..... + 2e → Cu
12. Write any 2 uses of Electrolysis.
13. Write any 2 examples of electroplated articles.
14. Symbols of some elements are given below.

    a) Arrange them in the increasing order of their reactivity.

       Na, Mg, Cu, Pb, Zn, Ag

    b) Among these metals which is kept in keroscene?

Answers : Unit - 3

1. Copper
2. Anode
3. Anode
4. Mixture of Sodium cynide solution and Gold cynide solution.
5. Hydrogen
6. Ag

7. Oxidation

8. Chemical energy to Electrical energy

9. Cathode

10. Salt bridge complete the circuit by the movement of the ions and it helps to maintaine the neutrality in the cell.

11. a) $Zn \rightarrow Zn^{2+} + 2e$

    b) $Cu2+ + 2e \rightarrow Cu$

12. 1. Manufacturing of metals

    2. Manufacturing of nonmetals

    3. Manufacturing of mixture

    4. Purification of metals (any 2)

13. a) Gold plated ornaments

    b) Chromium plated home appliences

    c) Silver plated vessels

    d) Copper plated vessels (Any two)

14. a) Ag < Cu < Pb < Zn < Mg < Na

    b) Na

EQUIP - 2024

SSLC - EXAMINATION SUPPORT MATERIAL

CHEMISTRY - ENGLISH MEDIUM

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1 Mark Questions

1. The Subshell present in all shells is

   (s, p, d, f)

2. What is the total number of electron present in 'P' subshells of $_{13}Al$?

3. Metal which reacts with cold water is .....

   (Na, Fe, Ag, Zn)

4. $C_3H_6 + Cl_2 \rightarrow$ .....

   ($C_3H_6Cl_2$, C_3H_8, $C_3H_7Cl_2$, $C_3H_8Cl_2$)

5. Write the IUPAC name of $CH \equiv CH$.

6. Write the functional group of alcohols.

7. Find out the volume of 1 mole of N_2 at STP?

8. Which block elements are used as fuels in nuclear reactors?

9. Whether iron bangle is used as cathode or anode while electroplating it with copper?

10. The Maximum number of electrons that can be accomodated in 'd' subshell is .....

    (14, 6, 2, 10)

11. Which substance is used to remove moisture from NH_3?

12. Which is the Anode in Zn - Ag cell?

13. Which is the Monomer of natural rubber?

14. Which is the concentration method used for concentrating Bauxite?

15. Name the functional group present in $CH_3 - O - CH_3$?

16. 5 - 8% Ethanoic acid is known as .....
17. Which property of Sulphuric acid is used in the preparation of SO_2 and HCl?
18. What is the Oxidation state of Mn in MnO_2?

    (Hint. Oxidation state of Oxygen is $^{-}2$)
19. Which one of the following subshells is not possible in an atom?

    (1s, 2p, 4d, 3f)
20. Identify the law in which the relationship between volume and number of molecules of a gas at constant temperature and pressure?

    (Boyle's law, Charle's law, Avagadro's law)
21. Tin stone (SnO_2) is the ore of tin. Which is the magnetic impurity present in tin stone?
22. Which of the following metal does not displace hydrogen from dilute acids?

    (Sodium, Iron, Copper, Magnesium)
23. Name the non-metallic compound used as a refrigerant in ice plants.
24. PVC is a polymer commonly used for making pipes. What is the name of its Monomer?
25. Elements used as catalysts in the refining of petroleum belongs to which block?
26. Name the process of the industrial prepation of Aluminium ?
27. Based on which process refining of metals like Copper and Gold is done?
28 3s, 4s subshells are given.Which subshell has more energy?
29. Which gas law shows the relation between volume and pressure at constant temperature?
30. What is the general formula of Alkenes?
31. 6.022×10^{23} is known as .....
32. Name the industrial preparation of Sulphuric acid?
33. What is the energy change in Galvanic Cell?
34. What is the volume of one mole of any gas at STP known as?
35. What is the number of moles present in 44.8L of any gas at STP?
36. The electrode at which reduction takes place in an electrolytic cell is .....

37. The maximum number of electrons occupied by 'P' subshell is .....

(14, 6, 10, 2)

38. Which is the mathematical expression of Boyl's law from the given expressions.

(PV = constant, $\frac{V}{T}$ = constant, $\frac{V}{n}$ = constant)

39. From the given elements, which one is less reactive?

(Na, Zn, Ag)

40. Calamine is the ore of .....

41. The density of ammonia is ..... compared to that air.

(Low / High)

42. Name the polymer used to line the inside of non-stick vessels.

43. In which block lanthanoid and actinoids belong?

44. Name the substance obtained by mixing methanol and ethanol to prevent from mis use as beverage?

45. Which solution is used as electrolite for plating gold on an iron bangle?

46. Name the industrial preparation of NH_3?

47. Write the subshell electronic configuration of O^{2-} ion?

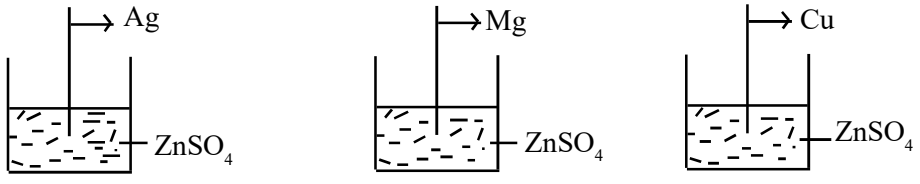
2 Mark Questions

48. The industrial preparation of H_2SO_4 is called Contact process.

a) Which substance is used as a catalyst here?

b) Name the compound formed after the dissolution of SO_3 in H_2SO_4. What is its molecular formula?

49. Some metals and $ZnSO_4$ solution is given.



(i) (ii) (iii)

a) In which beaker chemical reaction takes place? Why?

b) Write the chemical equation for the reaction?

50. $N_2 + 3H_2 \rightleftharpoons 2NH_3 +$ heat

Chemical equation for the preparation of Ammonia in Habour process is given above. To get more Ammonia in this equilibrium,

a) What changes are to be done in the concentration of N_2 and NH_3?

b) At what temperature the yield will be more? Why?

51. Some Sugar is taken in a watch glass and concentrated Sulphuric acid is added to it.

a) What changes occur?

b) Which property of Sulphuric acid is shown here?

52. Molecular mass of water is 18.

a) Find the number of moles in 180g water?

b) Find out the number of molecules present in it?

53. $N_2 + 3H_2 \rightleftharpoons 2NH_3$ + heat

Write any two methods to increase the rate of forward reaction.

54. Alcohols are Hydrocarbons with - OH as functional group.

a) Name the alcohol used in Beverages.

b) Write the chemical equation for the industrial preparation of methanol.

55. Haematite (Fe_2O_3), Magnetite (Fe_3O_4) and Copper Pyrites ($CuFeS_2$) are some ores of metals.

a) Which ore is concentrated by froath floation process?

b) Which ore is concentrated by Magnetic separation?

56. A glass rod dipped in concentrated hydrochloric acid is shown inside a jar which is filled with ammonia gas.

a) Write down your observation

b) $NH_3 + HCl \rightarrow$ .....

57. a) Which compound is added to Alumina during the electrolytical preparation of Aluminium?

b) Explain why it is done?

58. Write answers for the given questions related to Zn - Cu Galvanic cell.

a) Which Metal is acting as anode

b) Write the Chemical equation for the reaction at anode?

59. A little Ammonium Chloride (NH_4Cl), and Calcium hydroxide ($Ca(OH)_2$) are taken in a watch glass and mixed well.

a) Which gas is formed here?

b) Write its chemical nature? (Acidic / Basic)

60. a) Name the substance formed by the reaction of a carboxylic acid with alcohol?

b) Write any one pecularity in their property?

61. Size of a balloon is increased on blowing.

a) On the basis of which gas low it can be explained?

b) State the law?

62. See the electronic configuration of an atom with atomic number 12 written by children.

A - $1s^2\ 2s^2\ 2p^6\ 3s^2$

B - $1s^2\ 2s^2\ 2p^6\ 2d^2$

Which one is correct? Why?

3 Mark Questions

63. The given table is based on a gas law.

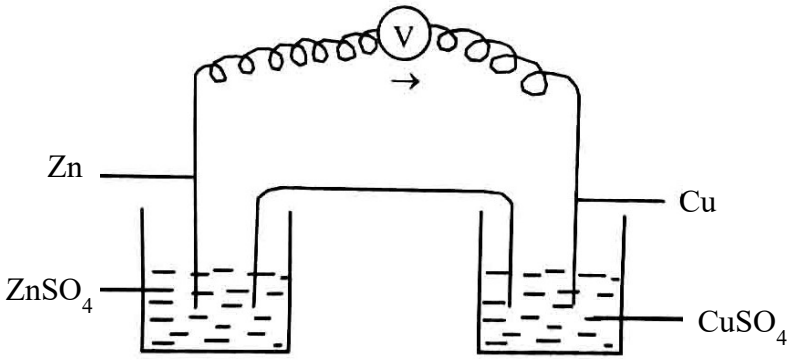
P	V	PV
100	20	2000
50	40	2000
20	100	2000

a) Identify the gas law?

b) Write the Mathematical expression of this law?

c) Which law relates volume and temperature of gases?

64.



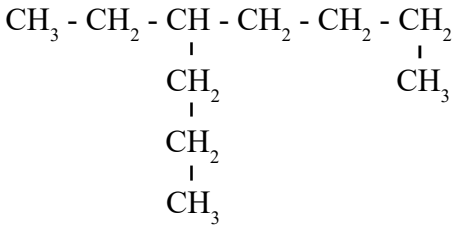
A galvanic cell made of Cu and Zn is given above.

a) Identify the cathode and anode in the above cell?

b) Write the chemical equation for the reaction taking place at cathode?

c) Show the direction of flow of electrones?

65. The structure of an organic compound is given.



a) How many carbon atos are present in the main chain of this compound?

b) Give the number of carbon at which the branch is seen?

c) Write the IUPAC name of this compound?

66. The element cromium with atomic number 24 is a d-block element. If so,

a) Write the complete subshell electronic configuration of this element?

b) Why does this atom show this type of difference in the electronic configuration?

c) In which group and period this element belongs?

67. During the electrolysis of solution of NaCl,

a) Name the products obtained at cathode and anode?

b) Write the equation for the reaction at anode?

c) Which compound can be prepared using this process?

68. a) Find the Oxidation state of Fe in $FeCl_3$ and write the subshell electronic configuration of Fe^{3+} ion .

(Hint : Fe = 26)

b) Find out the group and period of Fe?

69. $CH_3 - CH_2 - \underset{\displaystyle CH_3 - CH - CH_3}{\underset{|}{CH}} - CH_3$

a) Write the number of Carbon atoms in the main chain?

b) Name the branch?

c) Write the IUPAC name of the compound?

70. The extraction of iron from its ore is done in a blast furnace?

a) Which is the ore used here?

b) Which are the substance fed into the blast furnace?

c) Identify the gangue and flux here?

71. Complete the table related to a gas law.

Temperature (T)	Volume (V)
300K	900L
(a) ____K	600L
450K	(b) ____L

a) Write the values (a) and (b)?

b) Identify the gas law?

72. The following are the chemical equation representing the industrial preparation of Ethanol.

A) $C_{12}H_{22}O_{11} + H_2O \xrightarrow{(A)} C_6H_{12}O_6 + C_6H_{12}O_6$

Glucose Fructose

B) $C_6H_{12}O_6 \xrightarrow{(B)} C_2H_5OH + 2CO_2$

Ethanol

a) Identify the enzymes A and B? (1)

b) What is rectified spirit? (1)

c) What is power alcohol? (1)

73. The electronic configuration of the elements A, B, C, D are given below.

A - $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^4$

B - $1s^2\ 2s^2\ 2p^6\ 3s^2$

C - $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^5$

D - $1s^2\ 2s^2\ 2p^6\ 3s^1$

a) Which of these elements show +2 oxidation state?

b) Which element belongs to 17^{th} group?

c) Which is the period number of the element A? What is the basis of your findings?

(Symbols are not real)

74. Complete the table

Substance	GMM	Given Mass	No.of Moles	Number of Molecules
Oxygen O_2 (Molecular Mass = 32)	32g	64g	....(a)....	....(b)....
Ammonia (NH_3) (Molecular Mass = 17)	....(c)....	....(d)...	3	$3x6.022x10^{23}$
Water (H_2O) (Molecular Mass = 18)	18g	72g	....(e)....	....(f)...

75. The features of an organic compound are given.

* It's an alkane
* There are 6 Carbon atoms in the longest chain.
* There are Methyl radicals (1 each) on the 3rd & 4th carbon.

a) Write the structural formula of the compound? (2)

b) Write the IUPAC name of the compound? (1)

76. 5ml $AgNO_3$ is taken in a test tube and a Copper rod is dipped in it.

a) Observe the change occuring with the copper rod? (1)

b) Complete the equation of the reaction? (2)

$Cu + 2\ AgNO_3 \rightarrow$ ..... + ...

77. Some reactions regarding the production of an alcohol are given below.

$$C_{12}H_{22}O_{11} + H_2O \xrightarrow{\text{Invertase}} C_6H_{12}O_6 + ...(A).....$$

$$.....(A)..... \xrightarrow{\text{Zymase}} .....(B)..... + 2CO_2$$

a) Identify A and B? (1)

b) Write the name of the ester formed when the product B reacts with ethanoic acid? (1)

c) Write the Chemical equation for the formation of that ester. (1)

78. The Atomic number of element M is 17.

a) Write the complete sub shell electronic configuration of M?

b) In which block the element belongs to?

c) Write the molecular formula of the compound formed when it combines with N, which belongs to 1st group? (Symbols are not real)

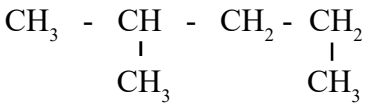
79. Answer the following questions related to the large scale preparation of Iron (Fe)

a) Name the ore used in the Extraction of Iron?

b) Why is limestone added during this process?

c) Write the chemical formula of the slag removed from blast furnace?

80.



Answer the following questions based on the hydrocarbon given above.

a) Write the number of Carbon atoms present in the longest chain?

b) Name branch in this compound?

c) Write the IUPAC name of this compound?

81. Combination of smaller molecules to form a very large chain like molecule is called Polymerisation.

a) What are the smaller molecules taking part in this reactions called?

b) Which is the monomer unit of Polythene?

c) Give any one use of Polythene?

82. Chemical equations for the Industrial preparation of Sulphuric acid is given

$$S + O_2 \rightarrow SO_2$$

$$2SO_2 + O_2 \underset{}{\overset{V_2O_5}{\rightleftharpoons}} 2SO_3$$

$$SO_3 + H_2SO_4 \rightarrow H_2S_2O_7$$

a) Name the compound $H_2S_2O_7$ formed during this process?

b) In which other name this acid known as?

c) Name the products formed during the dehydration reaction of Sulphuric acid with Sugar?

83. 85g of ammonia gas is stored at STP.

a) Calculated the number of molecules present in it?

b) Find out its volume

c) Find out the number of atoms present in this sample?
(Molecular mass of ammonia is 17)

84. Some metals and salt solutions are given.

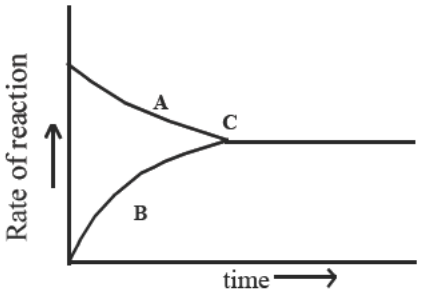
$MgSO_4$ solution, $CuSO_4$ solution, $AgNO_3$ solution
KNO_3 solution, Pb rod Cu rod, Mg rod, Pb rod)

a) Select the substance required for the construction of galvanic cell?

b) Which metal is anode in the cell constructed?

c) Write the chemical equation for the reaction taking place at cathode?

85. Observe the graph of chemical reaction and answer the following questions.



a) What do 'A' and 'B' represent?

b) What do 'C' represent?

c) What happen to the rate of forward and backward reaction at 'C'?

86. Chemical formula of some hydrocarbon chain are given.

C_4H_8, C_2H_6, C_3H_4, CH_4, C_5H_{10}, C_6H_{10}

a) Which are alkenes?

b) Write the general molecular formula of alkane?

c) Write the molecular formula of an alkyne with 5 carbon atoms from these?

87. During the electrolysis of NaCl,

a) Which substance is liberatd at anode?

b) Which is liberated at cathode?

c) Write the chemical equation for the reaction taking place at anode?

4 Mark Questions

88. Find out the isomer pairs from the given compounds and state which type of isomerism is shown?

i) $CH_3 - CH_2 - CH_2 - OH$

ii) $CH_3 - CH_2 - CH_2 - CH_3$

iii) $CH_3 - \underset{\displaystyle Cl}{\underset{|}{CH}} - CH_3$

iv) $CH_3 - CH_2 - CH_2 - Cl$

v) $CH_3 - O - CH_2 - CH_3$

vi) $CH_3 - CH_2 - \underset{\displaystyle CH_3}{\underset{|}{CH_2}}$

89. Complete the given table.

Nature of ore	Method of concentration	Example
Ore is denser than impurity	...(a)....	Ore of Iron, gold
....(b)....	Magnetic separation	Tin stone
....(c)....	Froth floatation	Sulphide
Soluble Impurities	Leaching	.....(d)....

90. a) Write the complete subshell electronic configuration of $_{25}Mn$.

b) Find the oxidation state of Mn in MnO_2?

c) Write the complete subshell electronic configuration of Mn^{2+} ion?

d) Write any one property of d-block elements?

91. Some terms related to the industrial preparation of ethanol is given.

a) Wash

b) Rectified spirit

c) Absolute alcohol

d) Power alcohol

Define the above terms.

92. A few drops of con.H_2SO_4 is dropped into sugar taken in a watch glass.

a) What is your observation?

b) Which property of H_2SO_4 is shown here?

c) Why isn't H_2SO_4 used as a drying agent in the laboratory preparation of NH_3?

d) Name the acidic substance obtain by the reaction of this acid with NaCl?

93. a) Find out the Isomeric pair from those given below. (2)

i) $CH_3 - CH_2 - CH_2 - CH_3$

ii) $CH_3 - O - CH_2 - CH_3$

iii) $CH_3 - \underset{\displaystyle CH_3}{\underset{|}{CH}} - CH_3$

iv) $CH_3 - CH_2 - CH_2 - OH$

b) Mention the type of Isomerism in each pair? (2)

94. Sub shell electronic configuration of an element is given below.

$1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^4$

a) Write the atomic number of this element?

b) How many shells are present in this atom?

c) Which is the outermost shell?

d) Find the block and group in which this element belongs?

95. $AgNO_3$ solution, $MgSO_4$ solution, Ag rod, Mg ribbon are given.

a) Draw and label the figure of a Galvenic cell using these? (2)

b) Write the Chemical equation of the reactions at Anode and Cathode? (2)

96. During the electrolysis of NaCl solution.

a) Name the products formed at Anode and Cathode? (2)

b) Write the Chemical equation occurs at Anode? (1)

c) Which is the product remains in the solution. (1)

97. Select the pecularities of 'f' block elements from the given statements.

a) They are transition elements.

b) Electrons are added to the anti penultimate shells.

c) Most of them are arificial elements.

d) Electrons are added to the penultimate shells.

e) They include both actinoids and lanthanoids.

f) They form coloured compounds.

g) Used in Petroleum industry.

98. A portion of the periodic table is given below. The symbols given are not real.

A	B
C	D 2, 8, 7

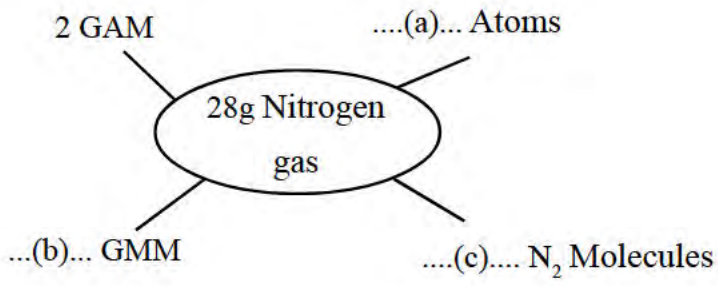
a) Write the electronic configuration of B and C? (1)

b) Find the atomic number of A and C? (1)

c) Which elements have the same valency? What is their valency? (1)

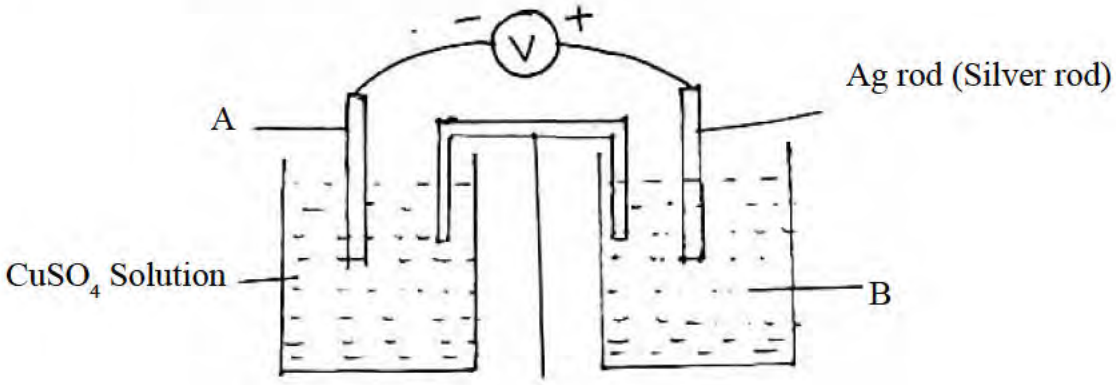
d) The valency of the element X is 1. Write the chemical formulae of the compound formed when the element X combines with A.

99. i) Complete the word web. (Atomic mass of Nitrogen is 14)



(ii) Write down the Avagadro number.

100. The picture of a Galvanic cell is given below.



a) Identify A and B?

b) Give the direction of electron flow?

c) Write the chemical equation at the anode and cathod?

101. Iron is industrially prepared mainly from Haematite.

a) Which substance reduces haematite in the metallurgy of iron?
How is this reducing agent produced in furnace? (2)

b) Which is the main impurity found in haematite?
Which substance is used to remove this gangue? (2)

102. a) Analyse the given organic compounds and answer the following questions.

(i) $CH_3 - O - CH_2 - CH_3$

(ii) $CH_3 - O - CH_3$

(iii) $CH_3 - CH_2 - CH_2 - OH$

(iv) $CH - \underset{\displaystyle OH}{\underset{|}{CH}} - CH_3$

a) Identify the isomer pairs. Write the type of isomerism observed in them?

b) Write the IUPAC name of the compound (i)?

103. 88g CO_2 given in a sample

(Atomic mass C-12, O-16)

a) What is the number of moles of CO_2 present in it?

b) What is the total number of atoms present in this sample?

c) Find out the numbers of molecules present in it?

d) What is the volume of this gas at STP?

104. Copper plays a very important role in our daily life.

a) Name one ore of Copper?

b) By which process Copper is refined?

c) Name the electrolyte used in this process?

d) Write the Chemical equation for the reaction taking place at Cathode?

105. Match the coloums B and C with coloumn A.

A	**B**	**C**
$H_2 + I_2 \rightleftharpoons 2HI$	Irreversible Reaction	Products get converted into reactants.
$NaOH + HCl \longrightarrow NaCl + H_2O$	Reversible Reaction	Products are not get converted into reactants.

106. Write the answers based on the electro plating of Iron bangle with gold.

a) Which is the electrolyte used here?

b) Identify the Cathode and Anode?

c) What happens to the gold ions reached on the bangle?

(Oxidation / reduction)

d) What happens to the gold plate?

(Oxidation / reduction)

107. Ethanol is a very important Solvent in Industry.

a) Name 8-10% solution of ethanol?

b) What is denatured spirit?

c) Write any two uses of ethanol?

d) Name the enzymes present in yeast during the process of Fermentation?

108. $CH_3 - CH_2 - \underset{\displaystyle CH_2 - CH_3}{\underset{|}{CH}} - CH_2 - CH_2 - CH_3$

a) Write the root name of the main chain?

b) Write the position of branch?

c) What is the name of the branch?

d) Write the IUPAC name of the compound?

109. Chemical reaction of certain hydrocarbon are given.

a) $2C_4H_{10} + 13O_2 \rightarrow 8CO_2 + 10H_2O$

b) $CH_3 - CH_2 - CH_2 + Cl_2 \rightarrow CH_3 - CH_2 - CH_2Cl + HCl$

c) $CH_3 - CH_2 - CH = CH_2 + H_2 \rightarrow CH_3 - CH_2 - CH_2 - CH_3$

d) $nCH_2 = \underset{\displaystyle Cl}{\underset{|}{CH}} \rightarrow \left[CH_2 - \underset{\displaystyle Cl}{\underset{|}{CH}} \right]_n$

1) Which represents displacement reaction?

2) Which shows combustion?

3) Which shows polymerisation?

4) Draw the structure of teflon?

110. Complete the table given below.

Element	Atomic number	Subshell electronic configuration	block	group	period
Na	11	$1s^2 2s^2 2p^6 3s^1$	s	1	3
Cl	17	$1s^2 2s^2 2p^6 3s^2 3p^5$	p	..(a)..	3
Mn	25	$1s^2 2s^2 2p^6 3s^2 3p^6 3d^5 4s^2$	..(b)..	7	4
Zn	30	$1s^2 2s^2 2p^6 3s^2 3p^6 3d^{10} 4s^2$	d	...(c)...	...(d)...

111. Structure of some hydrocarbons are given.

1) $CH_3 - CH_2 - O - CH_3$

2) $CH_3 - CH_2 - CH_2 - OH$

3) $CH_3 - CH_2 - CH_2 - CH_3$

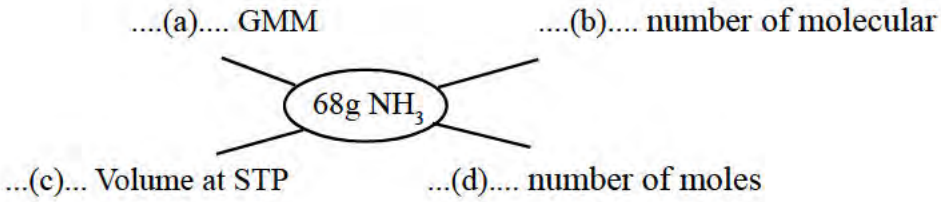
a) Write the position isomer of second compound?

b) Find out the functional isomer from them?

c) Write the chain isomer of compound (iii)?

d) Write the IUPAC name of first compound?

112. Find out a, b, c and d.



113. Some chemical equations based on the industrial preparation of iron is given.

i) $CO_2 + C \rightarrow 2\,CO$

ii) $Fe_2O_3 + 3CO \rightarrow 2Fe + 3CO_2$

iii) $CaCO_3 \rightarrow CaO + CO_2$

iv) $CaO + SiO_2 \rightarrow CaSiO_3$

a) Which substance is acting as reducing agent during this process?

b) Write the chemical equation for the formation of slag?

c) Which reaction shows the reduction of iron ore?

d) Name the substances used in blast furnace?

e) Name the iron obtained from blast furnace?

114. Match the following

Reaction	**Type of reaction**
$CH_4 + Cl_2 \rightarrow CH_3Cl + HCl$	Addition
$C_4H_{10} \rightarrow CH_4 + C_3H_6$	Combustion
$CH_4 + 2O_2 \rightarrow CO_2 + 2H_2O$	Polymarisation
$nCH_2 = CH_2 \rightarrow \ddagger CH_2\text{-}CH_2 \ddagger_n$	Displacement
$CH \equiv CH + H_2 \rightarrow CH_2 = CH_2$	Thermal decomposition

115. CH_3 - COO - CH_2 - CH_3 is an ester.

a) Name the ester?

b) Which is acid and alcohol used to prepare this?

c) What is this type of reaction known as?

d) What the chemical equation for the reaction?

116. Write the answers of a, b, c, d and e of the following table. (5)

Substance	GMM	Given Mass	No.of. Moles	No.of Molecules
NO_2	....(a).....	138g	3	.....(b)....
CO	28g	14g	.....(c).....	½x6.022x10^{23}
HNO3	63g	.....(d).....	2	.....(e).....

117.a) Match the following (4)

Reactants	Products	Name of the reactions
(i) CH_4+Cl_2	$\neg[CH_2 - CH_2]_n$	Thermal cracking
(ii) $C_2H_6 + O_2$	$CH_3Cl + HCl$	Polymerisation
(iii) $nCH_2=CH_2$	$CH_3-CH_2-CH_2-CH_3$ + $CH_3-CH = CH_2$	Combustion
(iv) $CH_3-CH_2-CH_2-CH_2-CH_2-CH_2-CH_3$	$CO_2 + H_2O$	Substitution reaction

b) Which is the main component in LPG? (1)

118. The main chain of an alkane without branch is given.

C - C - C - C

a) Complete the structural formulae.

b) Write the IUPAC name of this compound?

c) -COOH is added as functional group to the first carbon?

If so,

i) Write the structural formulae of the compound?

ii) Write the IUPAC name of that compound?

d) What is the name of the compounds having -COOH as functional group?

119. The Subshell electronic configuration of $_{29}Cu$ is given.

i) $1s^2, 2s^2, 2p^6, 3s^2, 3p^6, 3d^9, 4s^2$

ii) $1s^2, 2s^2, 2p^6, 3s^2, 3p^6, 3d^{10}, 4s^1$

a) Which is the correct subshell electronic configuration?

b) Justify your answer?

c) In which block the element belongs to?

d) Write any one property of elements of this block?

e) Write the group and period of this element?

120.. C_2H_4, C_3H_6, C_4H_8, ... are members of a homologous series.

a) Name this homologes series?

b) Write the Chemical formula of the next member?

c) What is the general formula of these compounds?

d) Write the structure of C_2H_4?

e) Write the structural formula and IUPAC name of the compound formed when C_2H_4 reacts with H_2.

121. Chemical reaction in a blast furnace during the preparation of iron is given,

i) $C + O_2 \rightarrow CO_2 + heat$

ii) $CO_2 + C + heat \rightarrow CO$

iii) $Fe2O_3 + 3CO \rightarrow 2Fe + 3CO_2$

iv) $CaCO_3 + heat \rightarrow CaO + CO_2$

v) $CaO + SiO_2 \rightarrow CaSiO_3$

a) Which reaction shows the reduction of iron ore?

b) Which compound is acting as flux here?

c) Which shows the formation of slag?

d) Name the slag formed here?

e) Name the ore fed into blast furnace?

122. Match the name of the given compounds.

a) $CH_3 - CH_2 - \underset{\displaystyle CH_3}{\underset{\vert}{CH}} - CH_3$	Butan - 2 - ol
b) $CH_3 - \underset{\displaystyle CH_3}{\underset{\vert}{\overset{\displaystyle CH_3}{\overset{\vert}{C}}}} - CH_3$	Pent - 2 - ene
c) $CH_3 - CH_2 - CH = CH - CH_3$	2 - Methyl butane
d) $CH_3 - CH_2 - \underset{\displaystyle OH}{\underset{\vert}{CH}} - CH_3$	Methoxy ethane
e) $CH_3 - CH_2 - O - CH_3$	2, 2 - Di Methyl propane
	2 - Methyl pentane
	Propan - 1 - ol

EQUIP - 2024

SSLC - EXAMINATION SUPPORT MATERIAL

CHEMISTRY - ENGLISH MEDIUM

Answer Key

1 Mark Question - Answers

1. s
2. 7
3. Na
4. $C_3H_6Cl_2$
5. Ethyne
6. - OH
7. 22.4L
8. f
9. Cathode
10. 10
11. Calcium Oxide or CaO or quick lime
12. Zn or Zinc
13. Isoprene
14. Leaching
15. Alkoxy group
16. Vinegar
17. Drying Agent
18. +4
19. 3f
20. Avagadro's Law

21. Iron Tungstate
22. Copper
23. Ammonia
24. Vinyl Chloride
25. f Block
26. Hall-Heroult Process
27. Electrolysis
28. 4s
29. Boyel's Law
30. $C_n H_{2n}$
31. Avagadro Number
32. Contact Process
33. Chemical Energy $\longrightarrow$ Electrical Energy
34. Molar Volume (22.4L)
35. $\frac{44.8}{22.4}$ = 2 Mole
36. Cathode
37. 6
38. PV = Constant
39. Ag
40. Zinc
41. Low
42. Teflon
43. f - block
44. Methylated spirit
45. Mixture of sodium cynide and gold cyanid
46. Habour Process
47. $1s^2\ 2s^2\ 2p^6$

2 Mark Question - Answers

48. a) V_2O_5 (Vanadium pentoxide)

Oleum $H_2S_2O_7$

49. a) Beaker 2 - Mg is more reactive than Zn

b) $Mg + ZnSO_4 \rightarrow MgSO_4 + Zn$

50. a) Increase the concentration of N_2 or decrease concentration of NH_3.

b) 450^0C. The optimum temperature for this reaction to take place is 450^0C.

51. a) black residue is formed

b) Dehydrating property

52. a) 10 b) $10xN_A$ ($10x6.022x10^{23}$)

53. Increase the concentration of H_2 or N_2; remove the NH_3 formed from the system.

(Any two points)

54. a) Ethanol (Ethyl alcohol)

b) $CO + 2H_2 \xrightarrow{catalyst} CH_3OH$

55. a) Copper Pyrites

b) Magnetite

56. a) Dense white fumes are forming

b) $NH_3 + HCl \rightarrow NH_4Cl$

57. a) Cryolite

b) To decrease the melting point of Alumina and to increase the electrical conductivity.

58. a) Zn

b) $Zn \longrightarrow Zn^{2+} + 2^{e-}$

59. a) Ammonia

b) Basic

60. a) Ester b) They are having smell of fruits or flowers

61. a) Avagadro's law

b) Statement of the law

62. A - $1s^2 2s^2 2p^6 3s^2$ because 2 d subshell doesn't exist.

3 Mark Question - Answers

63. a) Boyle's law

b) PV = a constant, $P\alpha\frac{1}{V}$

c) Charl's Law

64. a) Zn - Anode, Cu - Cathode

b) $Cu^{2+} + 2e^- \rightarrow Cu$

c) $Zn \rightarrow Cu$

65. a) 8

b) 4^{th}

c) 4 - Ethyl octane

66. a) $_{24}Cr$ - $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^6\ 4s^1\ 3d^5$

b) Half filled sub shells are more stable than partially filled subshells.

c) Group 6, Period 4

67. a) Anode - Cl_2, Cathode - H_2

b) $2Cl \rightarrow Cl_2 + 2e^-$

c) NaOH (Sodium hydroxide)

68. +3, $Fe^{3+} = 1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^6\ 3d^5$

69. a) 5 b) Methyl c) 2, 3 - di methyl pentane

70. a) Haematite b) Haematite Ore, Limestone, Coke

c) Gangue $\rightarrow$ Silica (SiO_2) Flux $\rightarrow$ CaO

71. a) 200K b) 1350L c) Charl's Law

72. a) A-Invertase, B - Zymase

b) 95.6% concentrated Ethanol is known as rectified spirit.

c) A mixture of absolute alcohol and petrol.

73. a) B

b) C

c) Periodic number 3. The period number is same as the shell number of shells present in the atom.

74. a) 2

b) $2 \times 6.022 \times 10^{23}$

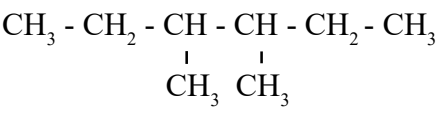
c) 17g

d) 51g

e) 4

f) $4 \times 6.022 \times 10^{23}$

75. a)



b) 3, 4 - Dimethyl hexane

76. a) Silver gets deposited at the copper plate.

b) $Cu + 2AgNO_3 \rightarrow Cu(NO_3)_2 + 2Ag$

77. a) A - $C_6H_{12}O_6$ B - $CH_3 - CH_2 - OH$ (C_2H_5OH)

b) Ethyl ethanoate

c) $CH_3 - COOH + CH_3 - CH_2 - OH \rightarrow CH_3 - COO - CH_2 - CH_3 + H_2O$

Ethyl Ethanoate

78. a) $1s^2, 2s^2, 2p^6, 3s^2, 3p^5$

b) P block

c) NM

79. a) Hematite

b) Remove Sand SiO_2

c) Ca Si O_3

80. a) 5

b) Methyl

c) 2-Methyl Pentane

81. a) Monomers

b) Ethene

c) Covers/Carry bags

82. a) Oleum

b) King of Chemicals

c) Carbon

83. a) 5 mole, $5x6.022x10^{23}$, $5N_A$

b) 5x22.4 / 112.0L

c) $4x5x6.022x10^{23}$

84. a) $Mg/MgSO_4$ and $Cu/CuSO_4$

b) Mg

c) $Cu^{2+} + 2e^- \rightarrow Cu$

85. a) A - forward reaction B - backward reaction

b) Equilibrium

c) Both become equal

86. a) C_5H_{10}, C_4H_8

b) C_nH_{2n+2}

c) C_5H_8

87. a) Cl_2

b) Na

c) $2Cl^- \rightarrow Cl_2 + 2e^-$

4 Mark Question - Answers

88. (i) and (v) are functional isomers

(iii) and (iv) are position isomers

89. a - Levigation

b - Ore or impurity is magnetic in nature

c - Ore is lighter

d - Bauxite

90. a) $_{25}Mn$ - $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^6\ 4s^2\ 3d^5$

b) $Mn^{+4}\ O_2^{-2}$ / +4

c) Mn^{2+} - $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^6\ 3d^5$

d) d-block elements are metals.

91. a) 8-10% alcohol

b) 95.6% alcohol

c) 100% alcohol

d) Mixture of petrol and alcohol

92. a) It turns black

b) Dehydration

c) They react to form ammonium sulphate

d) HCl

93. a) 'a' and c, b and d

b) i and iii - Chain Isomerism

ii and iv - Functional Isomerism

94. a) -16 b) 3 c) Third (M) d) Block - P, Group 16

95. a) Mg-Ag Cell diagram and labelling

b) Anode - $Mg \rightarrow Mg^{2+} + 2e^-$

Cathode - $Ag^+ 1e^- \rightarrow Ag$

96. a) Anode - Cl_2 gas b) H_2 gas

b) $2Cl^- \rightarrow Cl_2 + 2e^-$

c) NaOH

97. b, c, e, g

98. a) B - 2, 7

C - 2, 8, 6

b) Atomic number of A - 8

Atomic number of C - 16

c) AC & BD

Valency of A & C - 2

Valency of B & D - 1

d) X_2A

99. i) a) $2x6.022x10^{23}$ atoms

b) 1 GMM

c) $6.022x10^{23}$ molecules

ii) 6.022×10^{23}

100. a) A - Copper rod

B - $AgNO_3$ solution (Salt solution of Silver)

b) From Copper rode to Silver rod

c) Anode

$Cu \rightarrow Cu^{2+} + 2e^-$

Cathode

$Ag^+ + le^- \rightarrow Ag$ or $2Ag^+ + 2e^- \rightarrow 2Ag$

101. a) Carbon monoxide

Coke(c) reacts with Oxygen and form CO_2.

$C + O_2 \rightarrow CO_2$

CO_2 combines with more Carbon & produce CO

b) Silica (Silicon dioxide - S_1O_2)

CaO (Calcium Oxide) is used to remove Silica.

102. i) Isomer pairs

$CH_3 - O - CH_2 - CH_3$ & $CH_3 - CH_2 - CH_2 - OH$

$CH_3 - O - CH_2 - CH_3$ & $CH_3 - \underset{\underset{OH}{|}}{CH} - CH_3$

- Functional Isomerism

$CH_3 - CH_2 - CH_2 - OH$ & $CH_3 - \underset{\underset{OH}{|}}{CH} - CH_3$

- Position Isomerism

ii) Methoxy ethane

103. a) 2 mole $(\frac{88}{44} = 2 \text{ mole})$

b) $3x2x6.022 \times 10^{23}$ or $6 N_A$

c) $2x6.022x10^{23}$ Molecule $2 N_A$

d) $2x22.4 =$ **44.8L**

104. a) Copper Pyritis/Cuprite

b) Electrolysis

c) Copper Sulphate

d) $Cu^{2+} + 2e \longrightarrow Cu$

105.

A	**B**	**C**
$H_2+I_2 \rightleftharpoons 2HI$	Reversible Reaction	Products converts in to Reactants
$NaOH + HCl \longrightarrow NaCl + H_2O$	Irreversible Reaction	Products not converts in to Reactants

106. a) Sodium Cyanide + Gold Cyanide

b) Cathode - Iron Bangle

Anode - Gold

c) Reduction

d) Oxidation

107. a) Wash

b) The poisonus mixture of methanol and ethanol to prevent the mis use of ethanol.

c) Paints, Varnish, Organic solvents.

d) Invertase, Zymase

108. a) hex

b) 3

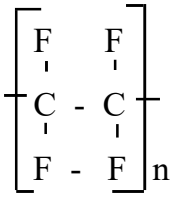
c) Ethyl

d) 3 - Ethyl hexane

109. 1 - b

2 - a

3 - d

4. 

110. a) 17

b) ‘d’

c) 12

d) 4

111. a) $CH_3 - \underset{\underset{OH}{|}}{CH} - CH_3$

b) 1 and 2

c) $CH_3 - \underset{\displaystyle CH_3}{\underset{|}{CH}} - CH_3$

d) Methoxy ethane

112. a) 4 GMM b) $4x6.022x10^{23}$ c) 4 x 22.4 L d) 4

113. a) CO

b) $CaO + SiO_2 \rightarrow CaSiO_3$

c) $Fe_2O_3 + 3CO_2 \rightarrow 2Fe + 3CO_2$

d) Haematite, Coke and lime stone

e) Pig iron

114. a) Displacement

b) Thermal Cracking

c) Combustion

d) Polymarisation

e) Addition

115. i) Ethyl ethanole

ii) Ethanol and Ethanoic acid

iii) Esterification reaction

iv) $CH_3 - CH_2OH + CH_3COOH \rightarrow CH_3 - COO - CH_2 - CH_3$

116. a) 46

b) $3 \times N_A$

c) ½

d) 126

e) $2x N_A$

117. i) $CH_4 + Cl_2 \rightarrow CH_3Cl + HCl$ - Substitution reaction

$C_2H_6 + O_2 \rightarrow CO_2 + H_2O$ - Combustion

$nCH_2 = CH_2 \rightarrow [CH_2\text{-}CH_2]_n$ - Polymerisation

$CH_3 - CH_2 - CH_2 - CH_2 - CH_2 - CH_2 - CH_3 \rightarrow CH_3 - CH_2 - CH_2 - CH_3 + CH_3 + CH = CH_2$

Thermal cracking

ii) Butane

118. a) $CH_3 - CH_2 - CH_2 - CH_3$ (Butane)

b) Butane

c) $CH_3 - CH_2 - CH_2 - CH_2 - COOH$

Pentanoic acid

d) Carboxylic acids

119. a) $1s^2, 2s^2, 2p^6, 3s^2, 3p^6, 3d^{10}, 4s^1$

b) Half filled or full filled d-subshells shows more stable than the other electronic configuration.

c) In d-block

d) * Produce coloured compounds

* Shows variable valency

e) Group 11, Period 4

120. a) Alkene

b) C_5H_{10}

c) $C_n H_{2n}$

d) $CH_2 = CH_2$

e) $CH_2 = CH_2 + H_2 \longrightarrow CH_3 - CH_3$

IUPAC Name is Ethane.

121. a) iii) b) CaO c) v) d) $CaSiO_3$ e) Hametite

122. a) 2 - Methyl Butane

b) 2, 2 - dimethyl propane

c) Pent - 2 - ene

d) Butan - 2 - ol

e) Methoxy ethane

◆◆◆