


I- SEM- COMMON/ 2019/ (OLD)
BST-102-ENGINEERING CHEMISTRY

Full Marks: 80

Time : 3 Hours

Answer any FIVE Questions including Q No. 1 & 2

Figures in the right hand margin indicates marks

1.	<p>Answer ALL questions :</p> <p>(a) What is the mass and charge of a proton?</p> <p>(b) Give an example of ionic compound and draw the Lewis structure of it.</p> <p>(c) What do you mean by conjugate acid and base pair? What is the conjugate acid of CO_3^{2-}?</p> <p>(d) Calculate the number of electrons, protons and neutrons present in Ca^{2+}.</p> <p>(e) Define electrochemical equivalent. Give the relation between equivalent mass and electrochemical equivalent.</p> <p>(f) What is calcination? Give two applications of calcinations.</p> <p>(g) Define normality? Represent its mathematical expression to calculate normality.</p> <p>(h) Which chemicals are responsible for permanent hardness of water?</p> <p>(i) Define monomer. What is the monomer of polyvinyl chloride?</p> <p>(j) Write down the general formula for alkyne and write the IUPAC structure of 3-Methyl but -1-yne.</p>	2×10
2.	<p>Answer any SIX questions :</p> <p>(a) Define Faraday's first law of electrolysis. Explain the law briefly.</p> <p>(b) What is concentration of ore? Write the gravity separation process.</p> <p>(c) What is fuel? What are the characteristics of a good fuel?</p> <p>(d) Differentiate ionic compound and covalent compound.</p> <p>(e) Define pH. How many grams KOH must be dissolved in one litre of solution to give it a pH value of 11? <i>0.0178</i></p> <p>(f) Write the composition and uses of producer gas.</p> <p>(g) Write the IUPAC name and structure of following compounds</p> <p>(i) 1,2-dimethyl benzene</p> <p>(ii)  <i>5-ethyl, 5-methyl hept-2-ene</i></p> <p>(iii) $\text{CH}_3\text{CH}(\text{OH})\text{CH}(\text{NO}_2)\text{CH}_2\text{CH}_2\text{CH}_3$ <i>3-nitro heptan-2-ol</i></p> <p>(iv) $\text{CH}_2\text{CH}(\text{I})(\text{C}_2\text{H}_5)\text{CH}(\text{Cl})\text{CH}_2\text{CH}_2\text{CH}_3$ <i>4-chloro, 3-ethyl, 2-iodo heptane.</i></p> <p>(v) Neo octane <i>$\text{H}_3\text{C}-\underset{\text{CH}_3}{\underset{ }{\text{C}}}-\text{CH}_2-\text{CH}_2-\text{CH}_2-\text{CH}_3$</i></p>	5×6
3.	<p>What is Bohr -Burry scheme? Write down the postulates of Bohr's atomic model.</p>	4+6
4.	<p>What are the limitations of Arrhenius concept of acid and bases? Explain the neutralisation of acid and base with an example? Calculate the equivalent weight of H_3PO_4 and $\text{Ca}(\text{OH})_2$. <i>$\frac{98}{3} = 32.6$, $\frac{74}{2} = 37$</i></p>	4+4+2
5.	<p>(a) Write the composition and uses of brass and alnico. <i>$3 \times 128 + 2 \times 118 = 226$</i></p> <p>(b) What is molarity? How many grams of barium chloride ($\text{BaCl}_2 \cdot 2\text{H}_2\text{O}$) have been dissolved in 300 ml of solution of molarity 0.50 M. <i>$w = \frac{226 \times 0.5 \times 300}{1000} = 33.9 \text{ gm}$</i></p>	5 1+4
6.	<p>(a) What is aromatic hydrocarbon? What are the conditions for aromaticity?</p> <p>(b) What is atmospheric corrosion? Explain the mechanism of rusting of iron.</p>	1+4 1+4
7.	<p>(a) What is polymerisation? Explain the polymerisation of Bakelite.</p> <p>(b) Explain the ion- exchange process for softening of water.</p>	1+4 5

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I- SEMESTER - COMMON /2019/ (New)
TH-2(b)-ENGINEERING CHEMISTRY

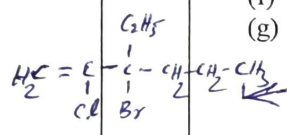
Full Marks: 80

Time : 3 Hours

Answer any FIVE Questions including Q No. 1 & 2

Figures in the right hand margin indicates marks

1.	<p>Answer ALL questions:</p> <p>(a) What is (n+l) rule? Arrange 3d, 4s, 4p & 5s in order of their increasing energy. $4s < 3d < 4p < 5s$</p> <p>(b) Draw the lewis structure of methane. What is the structure and bond angle of it?</p> <p>(c) What do you mean by amphoteric substance? Give an example of it.</p> <p>(d) Calculate the Molarity of sodium carbonate solution, 1.92 gm of which is dissolved in 400 ml of solution. $\frac{1.92 \times 1000}{106 \times 400} = 0.0452 M$</p> <p>(e) What is corrosion? Write the chemical formula of rust? $Fe_2O_3 \cdot xH_2O$</p> <p>(f) What are amalgams and alloys.</p> <p>(g) Write two uses of Benzoic acid.</p> <p>(h) Write the composition of CNG. Give two application of it.</p> <p>(i) What is Co-polymer? Give an example of it.</p> <p>(j) Write the disadvantage of Lime-soda process.</p>	2×10
2.	<p>Answer any SIX questions :</p> <p>(a) What are the postulates of Bohr's model of atom?</p> <p>(b) Explain the formation of NH_4^+</p> <p>(c) 4.6 gm of H_2SO_4 is present in 1.5 litre of its solution having density 1.4 gm/ml. Calculate Molarity and molality of the solution. $M = \frac{4.6 \times 1000}{98 \times 1500} = 0.031 M$ $m = \frac{4.6 \times 1000}{98 \times 2095.4} = 0.022 m$</p> <p>(d) Explain briefly about waterline corrosion.</p> <p>(e) Define flux. What is acidic flux and basic flux? Give two example of each.</p> <p>(f) Differentiate thermoplastic polymer and thermosetting polymer.</p> <p>(g) Write the IUPAC name and structure of following compounds</p> <p>(i) 3,3,4- trimethyl pentan-2-ol \rightarrow </p> <p>(ii) 2- chloro-3-bromo-3-ethyl hex-1-ene \rightarrow </p> <p>(iii) $CH_3CH(Cl)C(C_2H_5)_2CH_2CH_2CH_2CH_3$ \rightarrow 2-chloro-3,3-diethylheptane</p> <p>(iv) Toluene </p> <p>(v) Ethyne $HC \equiv CH$</p>	5×6
3.	(a) Write down the observation and conclusion of Rutherford's Gold foil experiment.	6
	(b) What are isotopes and isobars? Give an example of each.	4
4.	(a) What is ionic bonding? Explain briefly with an example.	4
	(b) Explain Faradays 2 nd law of electrolysis briefly.	4
5.	(c) Write the electronic configuration of Ti^{2+} and Cu^{2+} . $\rightarrow (Ar) 3d^2$ $\rightarrow (Ar) 3d^9$	2
5.	(a) make a comparison between cold and hot lime soda processes..	5
	(b) Find the pH of the solution contain 3.2 g of hydrogen chloride dissolved in 1.0 litre of water. $pH = 1.097$	5
6.	(a) What are hydrocarbon? Differentiate between saturated and unsaturated hydrocarbon.	4
	(b) Write the composition and uses of bronze and duralumin and alnico.	6
7.	(a) Write the importance of pH value in industries.	6
	(b) Write the functions of lubricants.	4



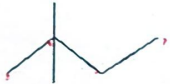
II- SEM/COMMON/2019(W)/NEW
Th. 2(b)-ENGINEERING CHEMISTRY

Full Marks: 80

Time : 3 Hours

Answer any **Five** Questions including Q No. 1 & 2

Figures in the right hand margin indicate marks

<p>1.</p> <p>(a)</p> <p>(b)</p> <p>(c)</p> <p>(d)</p> <p>(e)</p> <p>(f)</p> <p>(g)</p> <p>(h)</p> <p>(i)</p> <p>(j)</p>	<p>Answer ALL the questions :</p> <p>Write the no. of protons and neutrons present in Na^{23}. Which element has no neutron in its nucleus?</p> <p>What are acidic salts? Give two examples.</p> <p>Calculate the normality of sodium carbonate solution, 10.6gms of which are dissolved in 500ml solution.</p> <p>Calculate the equivalent weight of $\text{Al}_2(\text{SO}_4)_3$ and CH_3COOH.</p> <p>What is the difference between flux and slag?</p> <p>Write the importance of pH in sugar industry.</p> <p>What is Huckel's rule?</p> <p>Define calorific value of fuel. What should be the characteristic of a good fuel with respect to calorific value?</p> <p>Write two advantages of vulcanised rubber over raw rubber.</p> <p>Write the equations involve during removal of temporary hardness by boiling.</p>	<p>2×10</p>
<p>2.</p> <p>(a)</p> <p>(b)</p> <p>(c)</p> <p>(d)</p> <p>(e)</p> <p>(i)</p> <p>(ii)</p> <p>(iii)</p> <p>(iv)</p> <p>(v)</p> <p>(f)</p> <p>(g)</p>	<p>Answer any SIX questions :</p> <p>How Rutherford's atomic model failed to explain the stability of atom?</p> <p>Explain the formation of CH_4 molecule and NH_4^+ ion.</p> <p>Define molality. Calculate the molarity and molality of KOH solution formed by dissolving 2.8gm of it in 1litre of its solution having density 0.95gm/ml.</p> <p>What are non-ferro alloys? Write the composition and uses of bronze and alnico.</p> <p>Write the IUPAC name or structure of the following compounds.</p> <p>(i)  <i>2,2-dimethyl-Butane (Neopentane)</i></p> <p>(ii) $\overset{1}{\text{CH}_3}-\overset{2}{\text{CH}_2}-\overset{3}{\underset{\text{Br}}{\text{CH}}}-\overset{4}{\underset{\text{C}_2\text{H}_5}{\text{CH}}}-\overset{5}{\text{CH}_2}-\overset{6}{\text{CH}_3}$ <i>3-bromo-4-ethylhexane</i></p> <p>(iii) $\overset{1}{\text{CH}_3}-\overset{2}{\underset{\text{OH}}{\text{CH}}}-\overset{3}{\text{C}\equiv\text{CH}}$ <i>3-hydroxy</i></p> <p>(iv) 3-Methylpenta-1,3-diene</p> <p>(v) Pent-1-en-4-yne</p> <p>(f) State and explain Aufbau's principle. Write the electronic configurations of Cr and Fe^{2+}.</p> <p>(g) Give a comparison between thermosetting and thermoplastic polymers.</p>	<p>5×6</p>

3.	Explain Bronsted Lowry theory of acids and bases with limitations. Write the conjugate base of H_2SO_4 and H_3O^+ .	10
4.	State and explain Faraday's 1st and 2nd law of electrolysis. 1.35 ampere current was passed through zinc sulphate solution for one hour and as a result 1.64 gm of zinc was deposited at the cathode. Calculate the equivalent mass of zinc.	10
5.	<p>a) Explain mechanism of atmospheric corrosion. Why rusting of iron is quicker in saline water than in ordinary water?</p> <p>b) What are lubricants? Write the uses of graphite.</p>	7 3
6.	<p>Write short notes on:</p> <p>(a) Froth floatation process.</p> <p>(b) Electrorefining.</p>	5X2
7.	<p>a) What is hardwater? How hardness of water can be removed by ion-exchange method?</p> <p>b) What are herbicides? Write two uses of herbicides.</p>	7 3

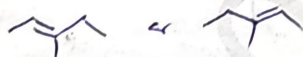
Full Marks: 80

Time- 3 Hrs

Answer any five Questions including Q No.1 & 2
 Figures in the right hand margin indicates marks

Answer **All** questions.

2 x 10

1. a. What do you mean by 'penultimate shell'? what is the maximum capacity of this shell to hold electrons?
- b. What are basic salts? Give an example of it.
- c. What happens in the reduction step of metallurgical operation?
- d. Give the bond-line formula of 3-Methylpent-2-ene. 
- e. Which chemical substances are responsible for the temporary hardness of water? $\text{CaCO}_3, \text{MgCO}_3$
- f. Write down the electronic configurations of Cu and Fe^{3+} ion.
- g. What is the major component of CNG? Give one use of CNG. $\text{C}_2\text{H}_6 = (5-10\%)$
 $\text{CH}_4 = (70-90\%)$
- h. Name the monomers of Bakelite. phenol + formaldehyde
- i. Define insecticides. Give example of an insecticide. pyrethrin, DDT
- j. What are lubricants? Give an example of solid lubricant.

2. Answer **Any Six** Questions

6 x 5

- a. Define p^{H} of a solution. How many grams of NaOH are required to prepare 2 litres of its solution having p^{H} 12? $[\text{OH}^-] = 10^{-2} \quad w = \frac{10^{-2} \times 40 \times 2000}{1000} = 0.8 \text{ gm}$

b. Explain electrolysis of aqueous solution of NaCl.

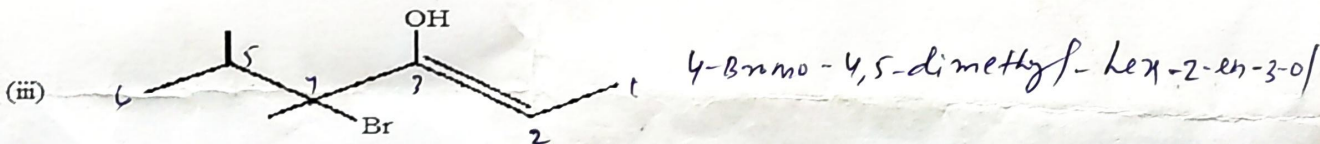
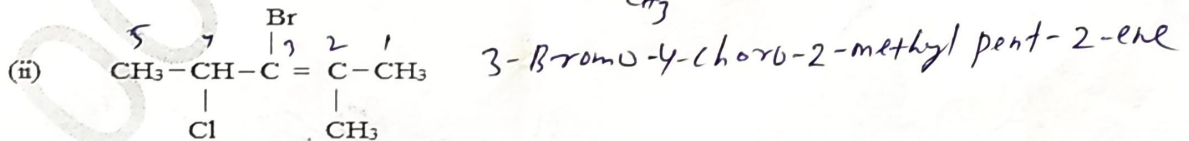
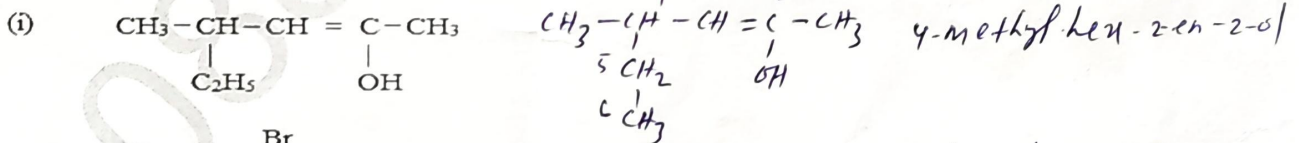
c. Explain magnetic separation method of concentration of ores with a neat and labelled diagram.

d. Define hardness of water. Explain cold-lime soda process of removal of hardness of water.

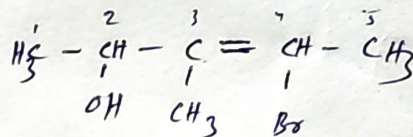
e. Write a brief note on preparation and uses of Bakelite.

f. Define and explain Arrhenius theory of acids and bases. What is neutralization reaction?

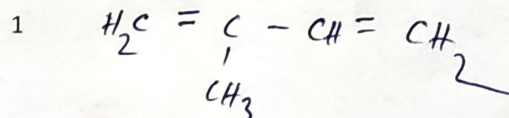
g. Write down the IUPAC names/structural formulae of the following.



(iv) 4-Bromo-3-methylpent-3-en-2-ol



(v) 2-Methylbuta-1,3-diene



- $\frac{22}{2}$
- $w = \frac{0.1 \times 37 \times 2500}{1000} = 925 \text{ gm}$
- 3 (a) Briefly explain 'Bohr's atomic model' for hydrogen atom. 06
 (b) How many grams of Ca(OH)_2 are required to prepare 2.5 litres of its decinormal solution? 04
- 4 (a) What are lubricants? Write down the purpose of lubrication. 06
 (b) Define herbicide and fungicide with at least two examples from each. 04
- 5 (a) Write down the composition and uses of producer gas. 05
 (b) Give a brief note on 'Galvanization'. 05
- 6 (a) Define Faraday's 1st law of electrolysis. How many grams of silver will be deposited by the passage of 50 ampere of current through silver nitrate solution of 30 minutes? 05
 (b) Define covalent bonding. Explain the formation of CH_4 molecule. 05
- 7 (a) Define and explain vulcanisation of raw rubber. 05
 (b) Distinguish between saturated and unsaturated hydrocarbons. 05

$$w = \frac{M I T}{2f}$$

$$= \frac{108 \times 50 \times 1800}{1 \times 96500}$$

$$= 1.067 \text{ gm}$$

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ENGINEERING CHEMISTRY

(Code : BST-102)

Full Marks : 80

Time : 3 hours

Answer any five questions including Q. Nos. 1 & 2

Figures in the right-hand margin indicate marks

1. Answer all questions : 2 x 10

- (a) Write the electronic configuration of Cu, N^{3-} , P, Ca^{2+} ?
- (b) Atomic weight of a trivalent metal is 27. What will be its equivalent weight ?
- (c) What are complex salts ? Give examples ?
- (d) What acid fluxes ? Give example ?
- (e) What are conjugate acids of ammonia, water and conjugate bases of hydronium ion, ammonium ion ?
- (f) Why do the atoms combine ?
- (g) What is galvanization ?
- (h) Write the structure of t-butyl chloride and neo-hexane ?
- (i) What are homopolymers and co-polymers ?
- (j) Write the functions of soda ash (Na_2CO_3) in lime-soda process ?

2. Answer any six questions : 5 x 6

- (a) Write the failure of Rutherford's atomic model ?
- (b) Explain the formation of $MgCl_2$ molecule ?
- (c) What is electrolysis ? Explain the electrolysis of fused NaCl molecule ?
- (d) 19.6 grams of H_2SO_4 are present in 2 litres of its solution. Calculate the normality, molarity and pH of the solution ? ($\log_2 = 0.3010$)
- (e) Explain the functions of lubricants ?
- (f) Explain the regeneration of exhausted ion-exchange resin ?
- (g) What are LPG and CNG ? Write the compositions and uses of these ?
- (h) Write the rules employed for IUPAC nomenclature of compounds containing single functional group ?
- (i) What is concentration of ore ? Explain the gravity separation process ?

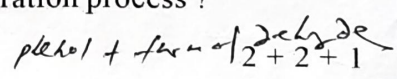
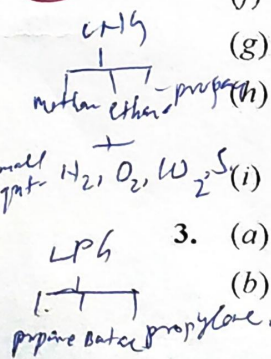
3. (a) Write the preparation, structure and uses of Bakelite ?
- (b) 10.6 grams of washing soda dissolves in water to prepare 0.5 litres of its solution.

$Na_2CO_3 = 46 + 12 + 48 = 106$
 $g.m. \text{ eq. weight} = \frac{106}{2} = 53$
 $Vol^m = 0.5 = 500 ml$
 $w = 10.6 gm.$
 $Normality = \frac{10.6 \times 1000}{53 \times 500} = 0.4 N.$
 $Molarity = \frac{0.4}{2} = 0.2 N$

(Turn Over)

$\frac{2 \times 0.2}{2} = M$
 $(0.1 M)$

$N = \frac{19.6 \times 1000}{49 \times 2000} = 0.2$
 $pH = -\log(0.2)$
 $= -\log(10^{-1} \times 2)$
 $= -\log 2 - \log 10^{-1}$
 $= -0.3010 + 1$
 $= 0.699$
 (0.7)



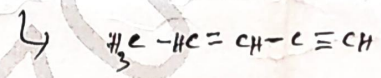
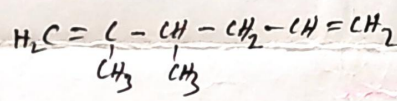
density = 1.01 gm/ml

$$\begin{aligned} \text{mass of total vol} &= 1.01 \times 500 \\ &= 505 \text{ gm} \\ \text{mass of solvent} &= (505 - 10.6) \text{ gm} = 494.4 \text{ gm} \\ m &= \frac{10.6 \times 1000}{106 \times 494.4} = 0.202 \text{ m} \end{aligned}$$

(2)

If the density of solution is 1.01 gm/ml, then calculate normality, molarity and molality of solution ?

4. (a) What is electroplating ? Explain, the process of electroplating ? 1 + 4
- (b) Give the definitions of copolymers, calorific value, ferrous alloy, electrolytes, basic salt ? 5
5. (a) Define electrolysis ? State and explain Faraday's laws of electrolysis ? 1 + 6
- (b) Write the limitations of Lewis theory of acids and bases ? 3
6. (a) What are hydrocarbons ? Write the differences between aliphatic and aromatic hydrocarbons ? 1 + 4
- (b) What is corrosion ? Explain the mechanism of rusting of iron ? 1 + 4
7. (a) Write the magnetic separation process of concentration of ore. 5
- (b) Write the IUPAC names of first three and structures of last two compounds ? 5
 - (i) $\text{CH}_3\text{CH}(\text{CH}_3)\text{CCl}_2\text{CHCH}_2$ 3,3-dichloro-2-methyl pentane.
 - (ii) $\text{CHCC}(\text{CH}_3)_2\text{C}(\text{CH}_3)_3$ 3,3,4,4-tetramethyl pentane
 - (iii) $\text{CH}_3\text{CHCHCH}_2\text{CCH}$ Hex-2-en-5-yne
 - (iv) 2, 3-dimethyl-hexa-1, 5-diene
 - (v) Pent-2-en-4-yne.



Handwritten notes in the left margin, including calculations and chemical symbols.

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ENGINEERING CHEMISTRY

(Theory : 2(b))

Full Marks : 80


Time : 3 hours

Answer any five questions including Q. Nos. 1 & 2

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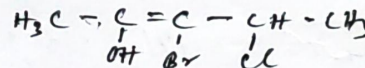
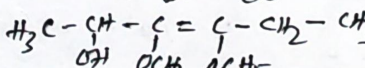
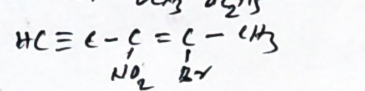
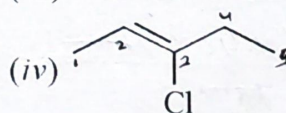
1. Answer all the questions :

2 × 10

- (a) Define homopolymer and co-polymer.
- (b) Give the bond line structural formula of neoprene. 
- (c) What are the maximum capacities of valence shell and penultimate shell of an atom to hold electrons ?
- (d) Name the monomers of bakelite and PVC.
- (e) Write any four important uses of benzene.
- (f) What do you mean by gangue ? Which method is suitable for the concentration of sulphide ores ?
- (g) Find the number of unpaired electrons in an atom of Nickel.
- (h) Why $AlCl_3$ is considered as a Lewis acid ?
- (i) What do you mean by Cobb control in paper manufacturing processing ?
- (j) Write the general formula of monohydric alcohol. Give the IUPAC name of its third member.

2. Answer any six questions :

5 × 6

- (a) What are the drawbacks of natural rubber ?
- (b) Define Roasting. Write down the functions of Roasting.
- (c) Define and explain Hund's rule. Why is it also called maximum multiplicity rule ?
- (d) Give the structural formula/IUPAC names of the following :
- (i) 3-Bromo-4-Chloropent-2-en-2-ol 
- (ii) 4-Ethoxy-3-methoxyhex-3-en-2-ol 
- (iii) 4-Bromo-3-nitropent-3-en-1-yne 
- (iv)  3-chloro-pent-2-ene
- (v) $CH_3CHClCHClCH(OH)CH_3$ 3,4-dichloropentan-2-ol.
- (e) Define lubricant. Write the composition and uses of bio-gas.

(Turn Over)

- (f) 5 lit. of an aqueous solution contains 19 gms of magnesium chloride. Find molarity and normality of the solution.
- (g) How many grams of NaOH are required to prepare 4 lit. of its solution having pH 10 ?
- (h) Define and explain Hückel's rule of aromaticity with suitable examples.
- (i) Define Faraday's 1st law of electrolysis. The same quantity of electricity is passed successively through aqueous AgNO_3 and CuSO_4 solution both connected in series. The weights of silver and copper deposited at the cathodes were found to be 4.32 gm and 1.27 gm respectively. If the equivalent weight of copper is 31.75, find that of silver.

- 3. Define and explain Lewis theory of acids and bases with its limitations. 5 + 5
- 4. Define hard water. What is hardness of water ? How can hardness of water be eliminated by organic ion-exchange resins ? 1 + 1 + 8
- 5. What happens during reduction step of metallurgical operation ? Define and explain smelting. 2 + 8
- 6. What is pH ? Write the application of pH in paper industries and sugar industries. 2 + 4 + 4
- 7. Write the composition, calorific values and uses of water gas and producer gas. 5 + 5

product $\text{H}_2 = 8-12$
 $\text{CO} = 22-30\%$ $\text{CO}_2 = 3\%$
 $\text{H}_2 = 51$ $\text{CO} = 41$ $\text{CO}_2 = 4$ 28W
1300 kcal/m³ Vol^m = 5 lit = 5000 ml. W = 19 gm

fuel
welding
source
H₂-gas

2(f) = Mol. mass of $\text{MgCl}_2 = 24 + 35.5 \times 2 = 24 + 71 = 95 \text{ g}$
gm. equivalent mass = $\frac{95}{2} = 47.5 \text{ gm}$

Molarity = $\frac{19 \times 1000}{95 \times 5000} = \frac{1}{25} = 0.04 \text{ M}$

Normality = $2 \times \text{Molarity} = 2 \times 0.04 = 0.08 \text{ N}$

(g) given pH = $-\log(\text{H}^+)$, $[\text{H}^+][\text{OH}^-] = 10^{-14}$
 $\Rightarrow 10 = -\log(\text{H}^+)$ $[\text{OH}^-] = \frac{10^{-14}}{10^{-10}} = 10^{-4}$
Vol = 4 lit = 4000 ml $\Rightarrow [\text{H}^+] = 10^{-10}$

W = $\frac{10^{-4} \times 40 \times 4000}{1000} = 0.016 \text{ gm}$

(i) $\frac{\text{Wt. of Ag}}{\text{Wt. of Cu}} = \frac{\text{Equiv. wt. of Ag}}{\text{Equiv. wt. of Cu}} \Rightarrow \frac{4.32}{1.27} = \frac{\text{Equiv. wt. of Ag}}{31.75}$
 $\Rightarrow \text{Equiv. wt. of Ag} = \frac{31.75 \times 4.32}{1.27} = \frac{137.16}{1.27} = 108$

ENGINEERING CHEMISTRY

(Theory : 2(b))

Full Marks : 80

Time : 3 hours

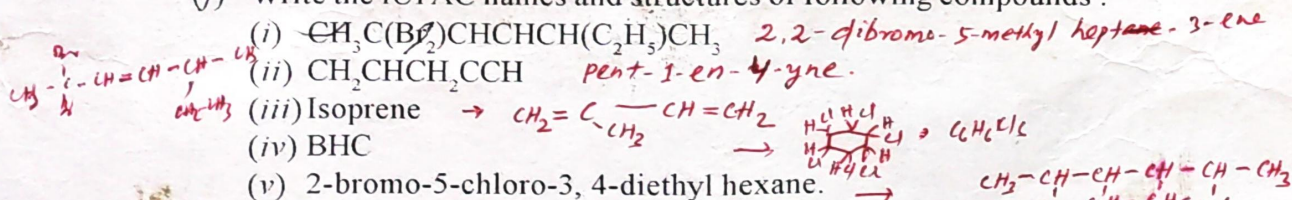
Answer any five questions including Q. Nos. 1 & 2
 Figures in the right-hand margin indicate marks

1. Answer all questions : 2 × 10

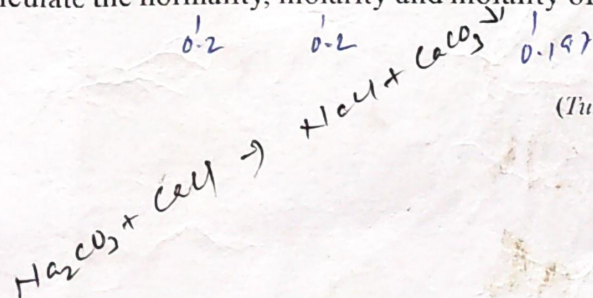
- (a) What are ore and mineral ?
- (b) Define galvanisation and electrorefining ?
- (c) Calculate the normality of H_2SO_4 solution containing 14.7 grams of solute in 3 litres of solution ? 0.1
- (d) What are insecticides ? Give two examples ?
- (e) Define isotopes and isotones.
- (f) What are primary fuels ? Give examples two gaseous primary fuels ?
- (g) What are saturated hydrocarbons ? Give examples.
- (h) What are acid radicals ? Give examples of two divalent monoatomic acid radicals ?
- (i) How Na_2CO_3 removes permanent hardness ?
- (j) Calculate equivalent weight of $MgCO_3$ and H_3PO_4 ?

2. Answer any six questions : 5 × 6

- (a) Write the failure of Rutherford's Atomic Model ?
- (b) Explain the formation of H_2O molecule ?
- (c) What is concentration of ore ? Write the magnetic separation process ?
- (d) Give comparison between various liquid fuels ?
- (e) Write the composition and use of polyvinyl chloride ?
- (f) Write the IUPAC names and structures of following compounds :



(g) 40 gms of caustic soda is dissolved in water to prepare 5 litres of its solution, having density 1.02 gm/cc. Calculate the normality, molarity and molality of the solution ?



(Turn Over)

- (h) What are bio-fertilizers ? Write uses of various such fertilizers ?
- (i) If 6.9 gms of K_2CO_3 is present in 0.5 litres of its solution, then calculate the normality and pH of the solution ?
3. Explain Bohr's Atomic Model ? How this model rectified the defect of Rutherford's Atomic Model ? 6 + 4
4. (a) Make a comparison between Arrhenius Theory and Lowry-Bronsted theory ? 5
(b) Explain the atmospheric corrosion ? 5
5. (a) What is electrolysis ? Explain the process of electroplating ? 1 + 5
(b) Write the limitations of Lewis theory for acid and base ? 4
6. (a) Write the composition and uses of brass, alnico and duralumin ? 6
(b) Write the uses of naphthalene and benzoic acid ? 2 + 2
7. (a) 21.2 gms of sodium carbonate is dissolved in water to prepare 2 litres of its solution, having density 1.01 gm/cc. Calculate the normality, molality of the solution ? 4
(b) Explain ion-exchange process of water softening ? 6