

POKHARA UNIVERSITY

Level: Bachelor

Semester: Fall

Year : 2023

Programme: BE

Full Marks: 100

Course: Applied Chemistry

Pass Marks: 45

Time : 3hrs.

6. b)
c)
a)
b)
c)
7. b)
Wr
a)
b)
c)

Candidates are required to give their answers in their own words as far as practicable.

The figures in the margin indicate full marks.

Attempt all the questions.

1. a) Write the applications of electrochemical series. Calculate the emf of the cell: $Zn(s) / Zn^{2+}(0.001M) // Ag^+(0.1M) / Ag(s)$ The standard electrode potential (E°) of Ag/Ag^+ is 0.80V and Zn/Zn^{2+} is -0.76V 8
OR

Define oxidation and reduction potential. A galvanic cell consists of metallic zinc plate in 0.1M $Zn(NO_3)_2$ solution and metallic plate of lead in 0.02M $Pb(NO_3)_2$ solution. Calculate the emf of the cell. Write the chemical equations for the electrode reaction and represent the cell. Given that: $E^\circ Zn^{2+}/Zn = -0.76V$ and $E^\circ Pb^{2+}/Pb = -0.13V$

- b) Define batteries. Explain primary and secondary batteries with examples. 7

2. a) Define soil pollution. Write causes, effects and control measures of soil pollution. 7

- b) Define Hardness of water. How do you determine free chlorine in the water sample in laboratory? 8

OR

Define Alkalinity and chemical oxygen demand. How do you measure alkalinity and dissolved oxygen in laboratory? Explain.

3. a) Explain the properties of transition metals with regards to the formation of coloured compounds and magnetic properties. 7

- b) Give reasons: 8

- i. Transition metals exhibit catalytic properties.
- ii. Zinc sulphate is colourless.
- iii. Transition metals are good in forming complexes.
- iv. Transition metals show variable oxidation states.

4. a) What product do you get from the reaction of R-2-chlorobutane with NaOH. Explain its mechanism and stereochemistry. 8

- b) What is Saytzeff's rule? Write the Kinetics and mechanism of E_1 taking suitable example. 7

5. a) Write the preparation and uses of the TNT and TNG. 5

Page 1 of 2

Candy 200

harry

- 1 = 5
2 = 3 is present
parallel to*
6. b) Explain the basic principle and application of sensors. 5
c) Write the preparation, properties and uses of silicone rubber. 5
a) Define bio-degradable polymers. Write examples of different types of bio-degradable polymers with applications. 7 *bio-degradable*
7. b) Write preparation, properties and uses of Teflon, PVC and Neoprene. 8
Write short notes on: (Any two) 2×5
a) Acidic and basic buffer
b) Factors affecting S_N2 reaction
c) Rules of electronic configuration

POKHARA UNIVERSITY

Level: Bachelor
 Programme: BE
 Course: Chemistry

Semester: Fall

Year : 2022
 Full Marks: 100
 Pass Marks: 45
 Time : 3hrs.

Candidates are required to give their answers in their own words as far as practicable.

The figures in the margin indicate full marks.

Attempt all the questions.

1. a) Define buffer solution. Write the mechanism of acidic buffer solution. 8
1.25g of anhydrous sodium acetate is added to 150ml of 0.03M acetic acid. What is the pH of buffer?
- b) Define standard electrode potential. Write applications of electrochemical series. From the given electrode potential values answer the following : 7
 - i. Write the electrode reaction.
 - ii. Write the cell reaction.
 - iii. Calculate the e.m.f. of the cell at 298K when both the Electrodes are coupled together.
$$E^0 \text{Zn}^{2+}/\text{Zn} = -0.76 \text{V}$$

$$E^0 \text{Pb}^{2+}/\text{Pb} = -0.13 \text{ V}$$

$$R = 8.314 \text{ J mol}^{-1} \text{ K}^{-1}$$

$$F = 96500 \text{C}$$

$$[\text{Zn}^{2+}] = 0.1 \text{M} \quad [\text{Pb}^{2+}] = 0.02 \text{M}$$
2. a) What is electron affinity? Write down the factors that affects the magnitude of electron affinity. Why is electron affinity of chlorine higher than fluorine? 7
b) What are transition elements? Explain the following striking features of transition elements with examples. 8
 - i. Colored compounds
 - ii. Magnetic behaviour
 - iii. Atomic radii

- What are optical isomers? Give suitable examples. Explain the stability of carbocations. Give its structure. 7
- b) What is electrophilic aromatic substitution? Give a suitable example. Differentiate between S_N1 and S_N2 reaction with mechanism. 8
4. ✓ a) Write the preparation, properties and uses of Nylon 6, 6 and Teflon. 5
b) Differentiate between addition and condensation polymerization. 5
c) Explain the process of vulcanization of natural rubber. 5
5. a) What is the principle of thin layer chromatography? Mention its applications in analytical field. 5
b) Give the methods of preparation of TNG and TNT and its important uses 5
c) What is cement? Write the method of preparation of cement in brief. 5
6. a) What is ozone layer depletion? Mention its main causes of ozone layer depletion and also point out its adverse effect as well as control of ozone layer depletion. 8
b) Define hardness of water. How it can be measured in laboratory? 7
7. Write short notes on: (Any two) 2×5
- a) Principle and Application of Mass Spectroscopy ✓
b) Stability and structure of Carbon free radicals
c) Difference between Thermoplastics and thermosetting plastics

POKHARA UNIVERSITY

Level: Bachelor
Programme: BE
Course: Applied Chemistry

Semester: Fall

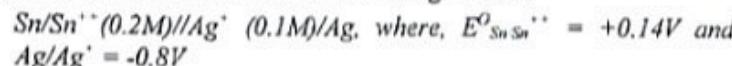
Year : 2022
Full Marks: 100
Pass Marks: 45
Time : 3 hrs.

Candidates are required to give their answers in their own words as far as practicable.

The figures in the margin indicate full marks.

Attempt all the questions.

1. a) What is Daniell cell? Calculate the emf of given cell 8 •



OR

What is electrochemical series? Calculate the emf of cell at 20 °C obtained from the following electrodes



- b) Explain about the electrochemical mechanism of corrosion. 7

2. a) What is water pollution? Explain about the sources, impacts and suitable remedies of water pollution. 8 •

OR

Give a short account of soil pollution, its sources and impacts.

- b) How can you determine free chlorine present in water in your lab? 7

3. a) Why all d-block elements are not true transition elements? Give the reasons for following 8 •

i) Zn

ii) salts are always colorless

iii) Transition elements represent variable oxidation states.

- b) Why the transition elements are preferred to produce compounds? 7
Give the applications of transition metals in your field of engineering.

4. a) How does SN2 reactions differ from SNI reaction? Explain with their mechanism taking suitable examples. 8

- b) Elimination reactions E1 and E2 depends on structure of substrate molecules. Explain it with relevant example. 7

5. Explain about the 3×5

a) TNT

b) Sensors

c) Setting and hardening of cements

6. a) Explain about the preparation and uses of PVC and Teflon 8

- b) How do conducting polymers differ from nonconducting polymer? 7
Explain with suitable examples.

7. Write short notes on: (Any two) 2×5

a) Paints

b) Air pollution

c) Photovoltaic cell

d) Salt bridge

1

Genie
Gense
Sense
Gone

2

POKHARA UNIVERSITY

Level: Bachelor
Programme: BE
Course: Chemistry

Semester: Fall

Year : 2021
Full Marks: 100
Pass Marks: 45
Time : 3hrs.

Candidates are required to give their answers in their own words as far as practicable.

The figures in the margin indicate full marks.

Attempt all the questions.

1. a) What is buffer solution? Write the mechanism of buffer action of acidic buffer with suitable example. Calculate the pH of buffer solution containing 400 mL of 0.3 M acetic acid and 200 mL of 0.6 M sodium acetate (K_a of acetic acid is 1.8×10^{-5}) 8
b) What do you mean by standard hydrogen electrode? What are the criteria of electrolytes to be used in salt bridge? Calculate the emf of the following cell. 2+2+3
$$\text{Zn(s)}/\text{Zn}^{+2}(0.1\text{M})//\text{Cu}^{+2}(1.75\text{M})/\text{Cu(s)} \text{ at } 25^\circ\text{C}$$
$$E^\circ_{\text{Zn}^{++}/\text{Zn}} = -0.76\text{V}$$
$$E^\circ_{\text{Cu}^{++}/\text{Cu}} = +0.34\text{V}$$
$$R=8.314\text{Jmol}^{-1}\text{K}^{-1}$$
$$F=96500\text{ C}$$
2. a) Give reasons for the followings: 8
 - i. TiCl_3 is coloured but TiCl_4 is colourless.
 - ii. Transition elements show variable oxidation state.
 - iii. Zn^{+2} salts are white.
 - iv. Cu is not considered as transition element.b) Define ionization energy. Explain the factors affecting negativity. How electron affinity of chlorine is higher than Fluorine. 7

- i) Define carbanion and free radical. Differentiate between S_N^1 and S_N^2 reaction. Give the mechanism of S_N^2 reaction with suitable example. 8
- ii) What do you mean by stereoisomer? Give example. Give the mechanism of electrophilic aromatic substitution reaction. 7
- iii) How can you prepare nylon-6,6, and bakelite. Write their properties and uses 7
- iv) Define silicone rubber and write their properties. What are the engineering uses of silicone rubber? 8
- v) Give the principle of NMR spectroscopy and mass spectroscopy. What is the significant application of these in analytical chemistry? Give the use of TLC. 8
- vi) What are lubricants? Give any three characteristics of good lubricant. Give the methods of preparation of TNT and TNG. Give any two precaution for storage of explosive. 7
- vii) What is ozone layer depletion? Mention the main causes of ozone layer depletion and also point out its adverse effect as well as control of ozone layer depletion. 7
- viii) What is hard water? How can it be measured in laboratory? 8

Write short notes on: (Any two) 2×5

- Electrochemical series and its application.
- Soil pollution, effects and its preventive measure.
- Different intermediate organic species.

POKHARA UNIVERSITY

Level: Bachelor
Programme: BE
Course: Chemistry

Semester: Spring

Year : 2021
Full Marks: 100
Pass Marks: 45
Time : 3hrs.

Candidates are required to give their answers in their own words as far as practicable.

The figures in the margin indicate full marks.

Attempt all the questions.

1. a) ~~✓~~ Buffer solutions are important part of the industrial and biochemical processes. Explain with an example why pH of a buffer solution does not change significantly on small addition of acids or bases. 8

A buffer solution contains 0.2M ammonium hydroxide and 0.2 M ammonium chloride. What will be the pH of resulting solution when 1 ml HCl is added? pK_b for NH₄OH is 4.75. Consider total volume of buffer solution is unchanged after adding HCl.

- b) ~~✓~~ Define Galvanic corrosion? Explain the mechanism of rusting of iron in terms of both chemical and electrochemical corrosion. 7

What is the concentration of Ni²⁺ in the cell at 27°C, if the emf is 0.601V?



Standard electrode potential of Nickel and Lead are -0.24V and 0.13V respectively.

2. a) Differentiate between electron affinity and electronegativity? How electronegativity varies on moving across the period and on descending down the group. 3+

- b) ~~✓~~ What are transition elements? Explain the following features of transition elements with examples. 4+

i. Electronic configuration

ii. Atomic radii ~~✓~~

3. a) Define carbonation. How are carbocation stabilized? Write any two methods of formation of carbocation. 2+

- b) State and illustrate mechanism of Markovnikov's rule.

0.023
8.421
2.35x10⁻¹⁶

4. a) What are the silicone resins? Explain the types of silicone with their uses.
b) Explain the mechanism of additional polymerization. How natural rubber is different from synthetic rubber?
5. a) Write the principle of Chromatography. Write the important applications of thin layer chromatography.
b) Define cement. Explain its manufacturing process.
6. a) Define water pollution. Write causes, effects and control measures of water pollution.
b) Discuss about the air pollution caused by oxides of non-metals
7. Write short notes on: (Any two)
a) Standard Hydrogen Electrode (SHE)
b) Thermoplastics and Thermosetting plastics.
c) Soil pollution

POKHARA UNIVERSITY

Level: Bachelor
 Programme: BE
 Course: Chemistry

Semester: Fall

Year : 2020
 Full Marks: 100
 Pass Marks: 45
 Time : 3 hrs.

Candidates are required to give their answers in their own words as far as practicable.

The figures in the margin indicate full marks.

Attempt all the questions.

1. a) Define buffer solution. Explain the mechanism of basic buffer. 8
 Calculate the pH of a buffer solution prepared by mixing 500ml of 0.6M sodium acetate and 700ml of 0.3M acetic acid.
- b) Write the mechanism of chemical and electrochemical corrosion. 7
 From the given electrode potential values answer the following :
 - i. Write the electrode reaction.
 - ii. Write the cell reaction.
 - iii. Calculate the e.m.f. of the cell at 298K when both the electrodes are coupled together .
$$E^{\circ} \text{Zn}^{2+}/\text{Zn} = -0.76 \text{V}$$

$$E^{\circ} \text{Cu}^{2+}/\text{Cu} = +0.34 \text{ V}$$

$$R = 8.314 \text{ J mol}^{-1} \text{ K}^{-1}$$

$$F = 96500 \text{C}$$

$$[\text{Zn}^{2+}] = 0.1 \text{M} \quad [\text{Cu}^{2+}] = 1.75 \text{M}$$
2. a) Give reason: 8
 - i. Transition elements are good in forming complexes.
 - ii. Ionization energy of neon is higher than fluorine.
 - iii. TiO_2 is white but TiCl_3 is violet.
 - iv. Cu(I) is diamagnetic whereas Cu (II) is paramagnetic.
- b) What is electron affinity? Write down the factors that affects the magnitude of electron affinity. Why is electron affinity of chlorine higher than fluorine? 7

3. a) What do you mean by SN_1 and SN_2 reaction? Explain the mechanism with specific example. 8
- b) How do enantiomers differ from diastereomers? Explain the stability of free radicals. 7
4. a) What are polymers? Discuss about the mechanism of condensation polymerization taking a suitable example. 8
- b) What is IUPAC name for monomer of teflon? Show the free radical addition mechanism for the preparation of teflon? 7
5. a) Write the principle of Chromatography. Write the important applications of thin layer chromatography. 8
- b) What is cement? Why gypsum is added in the cement? Write the method of preparations of cement in brief. 7
6. a) Define acid rain. Discuss about the sources, effects and important control methods of acid rain. 8
- b) Define hardness of water. How it can be measured in the laboratory? 7
Describe it.
7. Write short notes on: (Any two) 2×5
- a) Mass Spectroscopy.
- b) Lubricants and its types.
- c) Green house effect

POKHARA UNIVERSITY

Level: Bachelor
Programme: BE
Course: Chemistry

Semester: Fall

Year : 2019
Full Marks: 100
Pass Marks: 45
Time : 3hrs.

Candidates are required to give their answers in their own words as far as practicable.

The figures in the margin indicate full marks.

Attempt all the questions.

1. a) What is buffer solution? Write the mechanism of buffer action of acidic buffer with suitable example. Calculate the pH of buffer solution containing 400 ml of 0.3 M acetic acid and 200 ml of 0.6 M sodium acetate (K_a of acetic acid is 1.8×10^{-5}) 8
- b) Differentiate between chemical corrosion and electrochemical corrosion. From the given electrode potential values answer the following : 7
 - i. Write the electrode reaction.
 - ii. Write the cell reaction.
 - iii. Calculate the e.m.f. of the cell at 298K when both the electrodes are coupled together .

$E^{\circ} \text{Zn}^{2+}/\text{Zn} = -0.76 \text{V}$
 $E^{\circ} \text{Ag}^{+}/\text{Ag} = +0.80 \text{ V}$
 $R = 8.314 \text{ J mol}^{-1} \text{ K}^{-1}$
 $F = 96500 \text{C}$
 $[\text{Zn}^{2+}] = 0.01 \text{M} \quad [\text{Ag}^{+}] = 0.1 \text{M}$
2. a) Explain the following for the transition elements: 8
 - i. form colored compounds
 - ii. paramagnetic in nature
- b) What is electron affinity? Write the factors that affect electron affinity. Between nitrogen and oxygen which one has higher ionization energy give reason? 7
3. a) Explain the mechanism and stereochemistry of SN_2 reaction. 8
- b) What is electrophilic aromatic substitution? Write the mechanism of Halogenation taking suitable example. 7

4. a) Differentiate between thermoplastic and thermosetting plastics. Write the preparation, properties and uses of
i. Teflon
ii. Polyester
iii. PVC
- b) What is a chemical composition of natural rubber? How is it processed to obtain crepe rubber and smoked rubber? Write some advantages of vulcanized rubber. 7
5. a) What explosive describe the different types of explosive. Also write the preparation and uses of TNT and TNG 8
- b) Explain briefly:
i. Paper chromatography
ii. Mass Spectroscopy 7
6. a) What is hard water? Write its types and also methods of removal. 8
- b) Define alkalinity. How it can be measured in the laboratory? Describe it. 7
7. Write short notes on: (Any two) 2×5
- a) Biological oxygen demand
b) SN₁
c) NMR Spectroscopy

POKHARA UNIVERSITY

Level: Bachelor
 Programme: BE
 Course: Chemistry

Semester: Spring

Year : 2019
 Full Marks: 100
 Pass Marks: 45
 Time : 3 hrs.

Candidates are required to give their answers in their own words as far as practicable.

The figures in the margin indicate full marks.

Attempt all the questions.

1. a) Define buffer solution. Explain the mechanism of acidic buffer solution. Calculate the pH of 500 ml of buffer solution containing 0.2M of ammonium sulphate and 0.3M ammonium hydroxide which is 2.1% ionized in dilute solution.
 $(K_b \text{ of ammonium hydroxide is } 1.8 \times 10^{-5})$ 7 ✓
- b) Define electrochemical cell. The standard reduction potentials of Cu^{++}/Cu and Ag^+/Ag electrodes are 0.34V and 0.80V respectively. Construct a galvanic cell using these E° values. For what concentration of Ag^+ ions will the emf of the cell at 25°C be zero if the concentration of Cu^{++} is 0.01M. 8 ✓
2. a) Define Ionization energy. What are the factors which affect it? Discuss the variation of I.E in the periodic table. 7 ✓
- b) Give reason:
 - i) TiCl_3 is colored but TiCl_4 is colorless.
 - ii) Zn^{+2} salts are white.
 - iii) Cu is not considered as transition element.
 - iv) Transition elements show variable oxidation state.8 ✓
3. a) Define carbocation. How are carbocation stabilized? Write any two methods of their formation. 7 ✓
- b) What is β -elimination reaction? Write the differences between SN_1 and SN_2 reaction. 8 ✓
4. a) Write notes on
 - i. Natural Rubber
 - ii. Nylon-6,67 ✓
- b) Define the term polymerization. Explain the free radical mechanism for the polymerization of ethene. 8 ✓
5. a) How is cement manufactured? Explain in brief. 7 ✓
- b) Write principle and important applications of mass spectrometry in analytical field. Write the application of TLC. 8 ✓

- ✓ 6. a) What is water pollution? Point out the major causes of water pollution, their adverse effects and possible remedies. 7
- ✓ b) Define alkalinity. How is it estimated in the laboratory, explain? 8
- ✓ 7. Write short notes on: (Any two) 2×5
- a) Aromatic electrophilic substitution reaction
- ✓ b) Chromatography
- ✓ c) Silicon polymer

(1)

int^e ans^e

POKHARA UNIVERSITY

Level: Bachelor
Programme: BE
Course: Chemistry

Semester: Spring

Year : 2018
Full Marks: 100
Pass Marks: 45
Time : 3hrs. (1)

Candidates are required to give their answers in their own words as far as practicable.

The figures in the margin indicate full marks.

Attempt all the questions.

1. a) Write the mechanism of basic buffer solution giving suitable example. 7
200ml of 0.1M acetic acid is mixed with 400ml of 0.2M sodium acetate solution. calculate the p^H of resulting mixture. ($P^K=4.74$)
 - b) What do you mean by standard hydrogen electrode? How can we determine the standard electrode potential of zinc electrode by using SHE? From the given electrode potential values answer the following : 8
 - i. Write the electrode reaction.
 - ii. Write the cell reaction.
 - iii. Calculate the e.m.f. of the cell at 27°C when both the electrodes are coupled together .
- $E^0 \text{ Mg/Mg}^{++} = + 2.370 \text{ V}$
 $E^0 \text{ Fe/Fe}^{++} = + 0.44 \text{ V}$
 $R = 8.314 \text{ J mol}^{-1} \text{ K}^{-1}$
 $F = 96500 \text{ C}$
- $[\text{Mg}^{++}] = 0.1 \text{ M}$ $[\text{Fe}^{++}] = 0.01 \text{ M}$
2. a) Give reasons for the followings: 8
 - i. TiCl_3 is coloured but TiCl_4 is colourless.
 - ii. Transition elements show variable oxidation state.
 - iii. Zn^{+2} salts are white.
 - iv. Zn is not considered as transition element.
 - b) Define ionization energy. Explain the factors affecting negativity. 7
How electron affinity of chlorine is higher than Fluorine.
 3. a) Define carbocations. How carbocations are stabilized? Write any two 7

1

राजिना शुद्धिकरण सेट अपर्टमेंट

सिलानी ४ पालका

(फोटो योनि) ०६१५२८९५३

(2)

methods of their formation.

- b) What are elimination reactions? Write the mechanism and stereochemistry of E₁ and E₂ reaction. 8
4. a) Write the mechanism of addition polymerization. 5
b) What is condensation polymerization? Write preparation, properties and uses of Nylon 6, 6. 5
c) Compare the properties of raw rubber and vulcanized rubber. 5
5. a) Write the principle and applications of mass spectroscopy. 8
b) What are lubricants? How are they classified? What are the applicants of lubrication? 7
6. a) What is water pollution? Discuss its causes, effects to human health and ways to control it. 8
b) What is hard water? How can it be measured in laboratory? 7
7. Write short notes on: (Any two) 2×5
a) Mechanism of rusting of iron
b) Nitration
c) Ozone layer depletion

(3)

POKHARA UNIVERSITY

Level: Bachelor
 Programme: BE
 Course: Chemistry

Semester: Fall

Year : 2018
 Full Marks: 100
 Pass Marks: 45
 Time : 3 hrs.

Candidates are required to give their answers in their own words as far as practicable.

The figures in the margin indicate full marks.

Attempt all the questions.

1. a) What do you mean by acidic buffer? Derive Henderson Hasselbalch equation for acidic buffer. Calculate the P^H of 100 ml of 0.4NH₃ solution in which 20ml. of 0.5M HCl is added. ($PK_b = 4.74$) 8
 b) What do you mean by standard hydrogen electrode (SHE)? Calculate the emf of the cell at 25°C. 7
- | | |
|--|---|
| $E_{Fe^{++}/Fe^{+++}}^0 = +0.44V$
$[Fe^{++}] = 0.5M,$ | $E_{Ag/Ag}^0 = -0.80V$
$[Ag^+] = 0.2M$ |
|--|---|
2. a) Give reasons: 9
 - i) Second ionization energy is greater than first ionization energy
 - ii) Electron affinity of fluorine is less than chlorine
 - iii) Ionization energy of gallium is higher than aluminium
 - b) Explain why zinc sulphate salt is colorless whereas copper sulphate salt is blue colored. Transition metal compounds are generally paramagnetic in nature, explain it. 6
3. a) What is elimination reaction? Write the mechanism of E₁ and E₂ reaction with one proper example of each. 8
 b) Define free radical. Write the reaction mechanism of free radical addition reaction. 7
 4. a) What is condensation polymerization? Write the preparation, properties and uses of Nylon – 6, 6. 7
 b) Write short note on: 8
 -) Processing of natural rubber
 -) Silicones

- (a) 4
5. a) What is the principle of TLC? Mention its applications in analytical field. 5
b) Define explosive. Give the methods of preparation of TNT and its important uses. 5
c) What are three important raw materials used in the manufacture of cement? Explain reaction mechanism of setting of cement. 5
6. a) What is soil pollution? Discuss its effects on agriculture and living beings. How can it be controlled? 7
b) What are particulates? Classify particulates, and discuss in brief its effects on human. How can we control global warming and particulates? 8
7. Write short notes on: (Any two) 2×5
a) Stereoisomerism
b) Ozone layer Depletion
c) Mass spectroscopy

(5)

POKHARA UNIVERSITY

Level: Bachelor
Programme: BE
Course: Chemistry

Semester: Spring

Year : 2017
Full Marks: 100
Pass Marks: 45
Time : 3hrs.

Candidates are required to give their answers in their own words as far as practicable.

The figures in the margin indicate full marks.

Attempt all the questions.

1. a) What is buffer solution? Define acidic and basic buffer. How do you calculate the pH value of buffer mixture? Give your answer illustrating Henderson's Equation. Calculate the pH of resulted solution when 100ml of 0.05M HCL is added to 100 ml of 0.1M ammonia?($pkb = 4.74$) 8
 - b) Define electromechanical series with applications. What is the concentration of Ni^{2+} in the cell at $25^{\circ}C$, if the emf is 0.601V? 7
- $Ni(s)|Ni^{2+}(a = ?)||Cu^{2+}(0.75m)|cu(s)$
- Given
- $$E^0 Ni|Ni^{2+} = 0.25V \text{ & } E^0 Cu^{2+}|Cu = 0.34V$$
2. a) Define electron affinity. Explain the factors affecting electron affinity. How electron affinity of Chlorine is higher than Fluorine. 7
 - b) What are transition elements? Zinc and cadmium are not considered as transition metals give reasons. Explain the characteristics properties of transition element with regard to 8
 - i. complex formation
 - ii. oxidation state
3. a) Describe the structure, stability and reactions of carbocation. 8
 - b) Describe S_N1 and $E1$ reaction with mechanism. 7
4. a) Write the preparation, properties and uses of Teflon and Polyvinyl chloride. 8
 - b) What are the demerits of natural rubber? How the properties of it can be improved, explain it. 7
5. a) Give the principle of mass spectroscopy. Write the applications of TLC. 8

- b) What are essential requirements of an explosive? Compare the properties of solid and liquid propellants. 7
6. a) What is green house effect? Describe the photochemistry of ozone layer depletion. 7
- b) Define acid rain and alkalinity. Discuss briefly about source of water pollution, its effects and control measures. 8
7. Write short notes on: (Any two) 2x5
- a) Electronic configuration
- b) Corrotion and its mechanism and control
- c) Principle of paper chromatography

POKHARA UNIVERSITY

Level: Bachelor
Programme: BE
Course: Chemistry

Semester: Fall

Year : 2017
Full Marks: 100
Pass Marks: 45
Time : 3 hrs.

Candidates are required to give their answers in their own words as far as practicable.

The figures in the margin indicate full marks.

Attempt all the questions.

- | | | |
|-------|---|-----|
| 1. a) | Derive Henderson-Hassel Balch equation for Acidic buffer. What is the pH of 0.50M aqueous NaCN? Pkb for Cyanide ion is 4.70. | 8 |
| b) | Define electrochemical series with applications. Also explain rusting of iron with mechanism. | 7 |
| 2. a) | Define ionization energy. Why second ionization energy is always greater than first ionisation energy? Explain with suitable reason and examples. | 7 |
| b) | Give reasons | 8 |
| | i. Transition elements show paramagnetism | |
| | ii. $[\text{Mn}(\text{OH})_6]^{2+}$ is pale pink, MnO_2 is black and MnO_4^- is intensely purple colour | |
| 3. a) | Define free radicals with formation, structure and stability. | 7 |
| b) | Differentiate SN1 reaction and SN2 reaction in terms of their mechanism. | 8 |
| 4. a) | Write notes on vulcanization, Nylon and Teflon. | 7 |
| b) | Describe the mechanism of condensation and addition polymerization reaction. | 8 |
| 5. a) | Describe the principle of Nuclear Magnetic spectroscopy. | 5 |
| b) | Draw a neat and labeled diagram of Mass Spectrometer. | 5 |
| c) | Describe the chemistry of cement. | 5 |
| 6. a) | Define Ozone layer with its importance. | 5 |
| b) | Show your aquitance with global warming and green house effect. | 5 |
| c) | Write various causes of water pollution. How it can be control. | 5 |
| 7. | Write short notes on: (Any two) | 2x5 |
| a) | Chromatography | |
| b) | Chemical oxygen demand | |
| c) | Optical activity | |

सुगं द्वारा संपादित एड फोटोकी लाइन
कलकत्ता, महात्मा गांधी नगर
NCIT College

9

POKHARA UNIVERSITY

Level: Bachelor
Programme: BE
Course: Chemistry

Semester: Spring

Year : 2016
Full Marks: 100
Pass Marks: 45
Time : 3 hrs.

Candidates are required to give their answers in their own words as far as practicable.

The figures in the margin indicate full marks.

Attempt all the questions.

1. a) Define Buffer solution with types and mechanism of working. 7
- b) Define standard electrode potential. The standard reduction potential of Cu^{++}/Cu and Ni^{++}/Ni electrodes are +0.34V and -0.25V respectively. Construct a galvanic cell using these electrodes. Write the cell reaction and calculate the standard emf of the cell. For what concentration of Cu^{++} , the emf will be zero at 25°C if the concentration of the Ni^{++} is 0.01M. 8
2. a) Differentiate between ionization energy and electron affinity. Why and in what ways does lithium resemble magnesium. 8
- b) Give reasons:
 - i. Zinc is not considered as a true transition element.
 - ii. $[\text{Mn}(\text{OH})_6]^{2+}$ is pale pink, MnO_2 is black and MnO_4^- is intensely purple colour.
3. a) Differentiate carbocation and carbanion in terms of formation, structure and stability. 7
- b) Show the detail mechanism and role of solvent of S_N1 reaction and S_N2 reaction. 8
4. a) Write notes on Bakelite, Nylon and polyurethane. 7
- b) Describe the method of processing of Natural rubber and vulcanization. 8
5. a) Describe the principle of mass spectroscopy. Give reason why ¹²C carbon doesn't show NMR phenomenon while ¹³C shows NMR phenomenon though the relative abundances of ¹²C and ¹³C carbon are 98.9% and 1.1% respectively. 8

पुस्तकालय संस्थानी एवं प्रैटोकली समिति
प्रबन्धालय संस्थान ९८४९५९५५२२
PCTC College

२०७२-२०७३ वर्ष रेप्रिंट

ठिकाना ८८१०२१

०६१५१८९५३

- b) Define lubricants and cements with examples. Describe how cement is manufactured in industry. 7
6. a) Define Ozone layer with its importance. Describe how does it forms and depletes. 7
- b) Show your aquitance with cause of water pollution and its effect in human health. What are the control measures of water pollution. 8
7. Write short notes on: (Any two) 2×5
- a) Thin Layer chromatography.
- b) Polymerization
- c) Optical activity

सुगम स्टैंसनरी सञ्चायर्स एण्ड फोटोकपी सर्विस
बालकुमारी, ललितपुर ९८४७५९९५९२
NCIT College

सुगम स्टैंसनरी सञ्चायर्स एण्ड फोटोकपी सर्विस
बालकुमारी, ललितपुर ९८४७५९९५९२
नेपाल

72

POKHARA UNIVERSITY

Level: Bachelor
 Programme: BE
 Course: Chemistry

Semester: Fall

Year : 2016
 Full Marks: 100
 Pass Marks: 45
 Time : 3hrs.

Candidates are required to give their answers in their own words as far as practicable.

The figures in the margin indicate full marks.

Attempt all the questions.

1. a) Write the mechanism of buffer action of a solution containing a mixture of methanoic acid and sodium methanoate. 4+4
 A buffer solution containing 0.4 mol L^{-1} of ammonia solution and 0.6 mol L^{-1} of ammonium chloride has prepared. What will be the pH of this solution after 0.075 M HCl has been added to the buffer. (assume that volume is unchanged K_b for NH_3 solution = 1.8×10^{-5})
 $\text{NH}_3 + \text{H}_2\text{O} \Rightarrow \text{NH}_4^+ + \text{OH}^-$
- b) What do you mean by standard hydrogen electrode? Calculate the emf of the following cell. 4+3
 $\text{Zn(s)/Zn}^{+2}(0.1\text{M})//\text{Cu}^{+2}(1.75\text{M})/\text{Cu(s)}$ at 25°C
 $E^\circ_{\text{Zn}^{+2}/\text{Zn}} = -0.76\text{V}$
 $E^\circ_{\text{Cu}^{+2}/\text{Cu}} = +0.34\text{V}$
 $R = 8.314 \text{ J mol}^{-1}\text{K}^{-1}$
 $F = 96500 \text{ C}$
2. a) Define Ionization Energy. Why second Ionization Energy is greater than first Ionization Energy? Explain it. Discuss the general trend of its value in the period and group in the periodic table. 1+2+4
 b) Give reason . 4x2
 - i. Transition elements form significant number of complexes
 - ii. s-block elements are reducing in nature
 - iii. Transition elements show variable valency
 - iv. Zn^{+2} salts are white
3. a) What are reaction intermediates? Explain the structure and stability of different types of carbocation. 2+2+4
 b) Point out the differences between $\text{S}_{\text{N}}1$ and $\text{S}_{\text{N}}2$ reactions with suitable

- examples.
4. a) What is polymerization reaction? Write the different types of 2+5
polymerization with suitable examples for each.
- b) Write short notes on: 4×2
- i. PVC
 - ii. Vulcanization of rubber
5. a) Write the procedure involved in mass spectroscopy. How many NMR 5+2
signals would we expect in compound isomers of C_3H_6O .
- b) Write the functions of lubricants. How cement can be manufactured. 2+6
6. a) "Kathmandu is considered as one of the very polluted cities in Asia". 7
Discuss its causes, effects to human health and ways to control it.
- b) What are the causes of Hardness of water? How it can be measured in 2+6
the laboratory. Describe it.
7. Write short notes on: (Any two) 2×5
- a) Ozone layer depletion
 - b) Markovnikoff's rule
 - c) Thermoplastics and Thermosetting plastics

23

POKHARA UNIVERSITY

Level: Bachelor
 Programme: BE
 Course: Chemistry

Semester: Spring

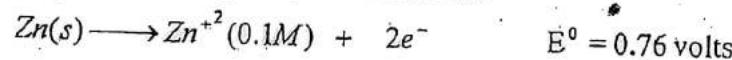
Year : 2015
 Full Marks: 100
 Pass Marks: 45
 Time : 3 hrs.

Candidates are required to give their answers in their own words as far as practicable.

The figures in the margin indicate full marks.

Attempt all the questions.

1. a) What is buffer solution? Write mechanism to show acid buffer solution of benzoic acid and sodium benzoate maintains its P^H constant even after addition of few drop of strong acid or base. Find the P^H of buffer solution which contains 0.1M potassium acetate and 0.2M of acetic acid with 2 % degree of dissociation. What will be changed in PH after addition of 2×10^{-3} M KOH solution. (K_a of acetic acid = 1.8×10^{-5})
- b) How does zinc metal produce single electrode potential? Use SHE to determine single electrode potential copper. Calculate the emf of the cell at 300K from given pairs of half cells.



2. a) Give reasons for the followings:
- TiCl₃ is coloured but TiCl₄ is colourless.
 - Transition elements show variable oxidation state.
 - Zn⁺² salts are white.
 - Cu is not considered as transition element.
- b) Define ionization energy. Explain the factors affecting negativity. How electron affinity of chlorine is higher than Fluorine.
3. a) What is Elimination reaction? Differentiate between E₁ and E₂ reaction with suitable reaction mechanism.
- b) How carbocation are produced? Explain their types along with stability order.

- (v)
4. a) What is polymerization reaction? Write the different types of polymerization with suitable examples for each. 8
b) Explain briefly: 7
- a) PVC
 - b) Vulcanization of rubber
5. a) What is the principle fractional distillation? Write its applications. 5
b) Write properties, preparation and uses of TNT and TNG. 5
c) Mention chemistry and setting mechanism of cements. 5
6. a) What is ozone layer depletion? Mention causes, hazardous affects and control measures of global warming. 8
b) Define alkalinity of water. How is it measure in the laboratory? 7
7. Write short notes on: (Any two) 2×5
- a) Corrosion
 - b) Nitration
 - c) Thermoplastics and Thermosetting plastics

POKHARA UNIVERSITY

Level: Bachelor
 Programme: BE
 Course: Chemistry

Semester: Fall

Year : 2015
 Full Marks: 100
 Pass Marks: 45
 Time : 3hrs.

Candidates are required to give their answers in their own words as far as practicable.

The figures in the margin indicate full marks.

Attempt all the questions.

1. a) Define Single electrode potential. How do you determine the single electrode potential of Ag - electrode experimentally? Explain. Calculate the emf of the cell at 27°C when given electrodes are coupled together. 2+3+3
- $$\text{Zn} \rightarrow \text{Zn}^{++} + 2e^{\ominus} E^{\ominus} = +0.76V$$
- $$\text{Ag} \rightarrow \text{Ag}^+ + 2e^{\ominus} E^{\ominus} = -0.80V$$
- $$R = 8.314 \text{ J K}^{-1} \text{ mol}^{-1}, [\text{Zn}^{++}] = 0.2M, [\text{Ag}^+] = 0.1M$$
- b) Define buffer solution. How does basic buffer resist the change in pH on adding few drops of acid and base? The pH of a buffer solution containing 0.5 mol/lit CH₃COOH and 0.5 mol/lit CH₃COONa is found to be 4.76. What will be the pH of this solution after adding 0.1 mol/lit HCl. Assume that the volume is unchanged. (K_a=1.75x10⁻⁵) 7
2. a) Give reasons for the followings: 8
- i. TiCl₃ is coloured but TiCl₄ is colourless.
 - ii. Transition elements show variable oxidation state.
 - iii. Zn⁺² salts are white.
 - iv. Cu is not considered as transition element.
- b) Differentiate between Electron affinity and Electronegativity. Explain the factor affecting the Ionization potential. 7

OR

What are representative elements? Write their properties.

3. a) What are enantiomers and diasteriomers? Write the characteristics of enantiomers. What are free radicals? Explain the factors that stabilize the free radicals. 8

- b) What are Electrophile and Nucleophiles? Write the product and mechanism of the following chemical reactions. 7
- $CH_3 - CH = CH_2 + HBr \xrightarrow{R-O-O-R}$
 - $(CH_3)_3C - Br + NaOH(aq) \longrightarrow$
 - $C_6H_6 + \text{Conc. } HNO_3 \xrightarrow{\text{Conc. } H_2SO_4}$
4. a) What is polymerization reaction? Write the different types of polymerization with suitable examples for each. 8
- b) Write short notes on: 7
- PVC
 - Vulcanization of rubber
5. a) What is the principle behind mass spectroscopy? Show your acquaintance to parent peak and base peak. 8
- b) What are lubricants? Explain different kinds of lubricants with example. 7
6. a) What are the causes of water pollution? Mention its effect on human health and also explain its controlling measures 8
- b) Define air pollution. What are the factors responsible for ozone layer depletion and what are its hazardous effect? Give your opinion. 7
7. Write short notes on: (Any two) 2×5
- Corrosion
 - Nitration
 - Thermoplastics and Thermosetting plastics

POKHARA UNIVERSITY

Level: Bachelor
 Programme: BE
 Course: Chemistry

Semester: Spring

Year : 2014
 Full Marks: 100
 Pass Marks: 45
 Time : 3hrs.

Candidates are required to give their answers in their own words as far as practicable.

The figures in the margin indicate full marks.

Attempt all the questions.

1. a) What is buffer solution? Write the mechanism of buffer action of acidic buffer with suitable example. Calculate the pH of buffer solution containing 400 ml. of 0.3 M acetic acid and 200 ml of 0.6 M sodium acetate (K_a of acetic acid is 1.8×10^{-5}) 7
- b) What do you mean by standard hydrogen electrode? Calculate the emf of the following cell 8
 $Zn(s)/Zn^{+2}(0.1M)//Cu^{+2}(1.75M)/Cu(s)$ at $25^\circ C$
 $E^\circ_{Zn^{+2}/Zn} = -0.76V$
 $E^\circ_{Cu^{+2}/Cu} = +0.34V$
 $R = 8.314 \text{ J mol}^{-1} \text{ K}^{-1}$
 $F = 96500 \text{ C}$
2. a) Give reasons for the followings 8
 - i. $TiCl_3$ is coloured but $TiCl_4$ is colourless.
 - ii. Transition elements show variable oxidation state.
 - iii. Zn^{+2} salts are white.
 - iv. Cu is not considered as transition element.
- b) Define ionization energy. Explain the factors affecting negativity. How electron affinity of chlorine is higher than Fluorine. 7
3. a) What are reaction intermediates? Explain the structure and stability of different types of carbocation. 8
- b) What is SN1 reaction? Give reaction mechanism and stereochemistry of SN1 reaction in given reaction 7
 $(CH_3)_3CX + NaOH(aq.) \rightarrow (CH_3)_3C-OH + NaX$
4. a) What is polymerization reaction? Write the different types of polymerization with suitable examples for each. 8

5. b) What is rubber? Write the process of vulcanization of rubber. 7
5. a) Write principle and important applications of mass spectroscopy in analytical field. Write the applications of TLC 8
6. b) What is explosive? Give the methods of preparation of TNT and its important uses. 7
6. a) What is ozone layer depletion? Write its adverse effect to living beings? Describe its photochemistry 8
6. b) Define water pollution. Discuss briefly about its sources, effects and control methods 7
7. Write short notes on: (Any two) 2×5
7. a) Corrosion, its types and prevention
7. b) Difference between E₁&E₂ reactions
7. c) Thermoplastics and Thermosetting Plastics

POKHARA UNIVERSITY

Level: Bachelor
 Programme: BE
 Course: Chemistry

Semester: Fall

Year : 2014
 Full Marks: 100
 Pass Marks: 45
 Time : 3hrs.

Candidates are required to give their answers in their own words as far as practicable.

The figures in the margin indicate full marks.

Attempt all the questions.

- | | | |
|-------|---|---|
| 1. a) | Define buffer solution Explain the mechanism of acidic buffer solution. Calculate the pH of a buffer solution prepared by mixing 400 ml of 0.5M sodium acetate and 800 ml of 0.1M acetic acid which is 1.3% ionized in dilute solution. | 8 |
| b) | What is standard hydrogen electrode? How can we determine the standard electrode potential of zinc electrode by using SHE? Determine the reduction potential of zinc electrode when it is dipped in to 0.1M $ZnSO_4$ solution at $25^\circ C$. Given standard oxidation potential of Zinc is 0.76 V. | 7 |
| 2. a) | Explain why ionization energy value of an ion increases as number of positive charge increases. Discuss the factors affecting its value . | 7 |
| b) | Give reasons: | |
| i. | Transition elements show variable oxidation states. | 8 |
| ii. | Mn can form complex compounds but not Mg. | |
| iii. | Zn is not considered as true transition element. | |
| iv. | Transition elements are mostly paramagnetic. | |
| 3. a) | Describe the reaction mechanism and stereochemistry of SN^1 reaction taking suitable example. What are the factors governing the rate of SN^1 and SN^2 reaction? | 8 |
| b) | Define carbocation. How are carbocations stabilized? Write any two methods of their formation. | 7 |
| 4. a) | Explain the procedures involved in the preparation of rubber. What do you mean by vulcanization of rubber? | 7 |

OR

Point out the major limitations of Bohr's atomic theory. Derive an

- expression so as to calculate the radius of Bohr's third orbit of H-atom.
- b) Write the preparation, properties and uses of PVC. Write the point of differences between thermosetting & thermoplastic polymer. 8
5. a) Explain the principle, and procedures involved for the separation of mixtures by thin layer chromatography. 8

OR

Define hybridization. Explain the formation of CH_4 molecule on the basis of hybridization. What is the cause of variation of bond angles between CH_4 , H_2O and NH_3 molecules?

- b) What are lubricants? How are they classified? Write down their uses. 7

OR

What is metallic bonding? How does electron sea model of metallic bonding explain the metallic properties like metallic luster, thermal and electrical conductivity?

6. a) What is ozone layer depletion? Mention the main causes of it. Explain the consequences of ozone layer depletion. What should be done to control it? 8
- b) What are the causes of hardness of water? How can it be measured in the laboratory? Describe it. 7

7. Write short notes on: (Any two)

- a) Corrosion, its types and prevention 2×5
- b) Acid rain
- c) Markovnikoff's rule

POKHARA UNIVERSITY

Level: Bachelor
 Programme: BE
 Course: Chemistry

Semester: Spring

Year : 2013
 Full Marks: 100
 Pass Marks: 45
 Time : 3hrs.

Candidates are required to give their answers in their own words as far as practicable.

The figures in the margin indicate full marks.

Attempt all the questions.

1. a) Write the mechanism of buffer action of a solution containing a mixture of benzoic acid and sodium benzoate. Calculate the PH of 500ml of a buffer solution containing 0.2M ammonium sulphate and 0.3M ammonia which is 2.1% ionized in dilute solution. 7

- b) What do you mean by standard electrode potential? How single electrode is potential originated? Calculate the emf of the following cell at 25°C $\text{Zn}/\text{Zn}^{++}(0.01\text{M})/\text// \text{Cu}^{++}(0.1\text{M})/\text{Cu}$. 8

Given,

$$E^{\circ} \text{ Zn}/\text{Zn}^{++} = 0.76\text{V}$$

$$E^{\circ} \text{ cu}/\text{cu}^{++} = -0.34\text{V}$$

$$R = 8.314 \text{ JK}^{-1} \text{ mol}^{-1}, F = 96500\text{C}$$

मुम्बायी विश्वविद्यालय
 कारकारा, सिंगापुर १५८७८९९५९२
 NECT College

2. a) Give reasons 8
- i. Transition elements form significant number of complexes.
 - ii. TiCl_3 compounds are coloured but those of TiCl_4 are colorless.
 - iii. Zn is not considered as true transition elements
 - iv. Transition elements show variable valency.
- b) Define Ionization Energy. Explain the factors affecting electronegativity? Why electron affinity of chlorine is higher than fluorine? 7
3. a) How do enantiomers differ from diastereomers? Differentiate between carbocations and carbonanions within their stability. 7
- b) What are elimination reactions? Write the mechanism of E_1 and E_2 reactions giving suitable examples. 8

4. a) Explain addition polymerization. How it differs from condensation polymerization? 7
 b) Write short notes on : 8
 i. Vulcanization of rubber
 ii. Nylon 6,6

OR

Explain de-Broglie's Principle of dual nature of electron. Calculate the radius of the orbit of electron of Hydrogen atom which is in the 3rd energy level.(mass of electron= 9.1091×10^{-31} kg, Plank's constant, $h=6.62 \times 10^{-34}$ Js, permittivity, $\epsilon_0 = 8.85 \times 10^{-12}$ kg⁻¹m⁻³A², charge on electron, $e=1.6 \times 10^{-19}$ C)

5. a) What do you mean by Paper chromatography? Explain briefly, how it can be used for analyzing solutes present in the given sample 7

OR

Explain the following:

- i. The compound having metallic bonds are good conductor of heat and electricity. 7
 - ii. Covalent bonds are directional in nature
 - iii. H₂O exist as liquid but H₂s as gas at room temperature
 - iv. Contraction of water takes place up to 4°C
- b) What are lubricants? Give its functions. Give the preparation method and uses of TNT. 8

OR

Differentiate between Molecular Orbital Theory with Valence Bond Theory. Write the characteristics of S-block elements. 8

6. a) What are the causes of air pollution? Write its impact on human health. Also mention its controlling measures. 7
 b) Define hardness of water. How it is estimated in the laboratory? 8
 7. Write short notes on: (Any Two) 2×5
- a) Corrosion
 - b) Ozone layer depletion
 - c) Green house effect and global warming.

POKHARA UNIVERSITY

Level: Bachelor
 Programme: BE
 Course: Chemistry

Semester: Fall

Year : 2013

Full Marks: 100

Pass Marks: 45

Time : 3 hrs.

Candidates are required to give their answers in their own words as far as practicable.

The figures in the margin indicate full marks. युग्म स्टेनरी सप्लाईर्स एण्ड फोटोकॉमी सर्विस
 बालकुमारी, ललितपुर ९८४९५९९९२
 NCIT College

1. a) Write the buffer mechanism of basic buffer solution giving suitable example. Calculate the pH of the solution formed by mixing 500 ml of 0.2 M acetic acid to 500 ml of 0.4 M sodium acetate. Also calculate the pH of resulting solution when 1 ml of 1M HCl is added to the above solution. pKa for acetic acid is 4.74. 8
- b) How is single electrode potential of Cu electrode measured experimentally? From the given electrode potential values answer the following: 7
 - i. Write the electrode reactions.
 - ii. Write the cell reaction.
 - iii. Calculate the e.m.f. of the cell at 27°C when both the electrodes are coupled together

$E^0_{\text{Mg/Mg}^{++}} = +2.370 \text{ v}$,
 $E^0_{\text{Fe/Fe}^{++}} = +0.440 \text{ v}$
 $R=8.314 \text{ J mol}^{-1} \text{ K}^{-1}$
 $F=96500 \text{ C}$
 $[\text{Mg}^{++}] = 0.1 \text{ M}, [\text{Fe}^{++}] = 0.01 \text{ M}$
2. a) Give reasons: 8
 - i. Ionisation energy of nitrogen is greater than oxygen.
 - ii. Electron affinity of chlorine is higher than fluorine.
 - iii. Electro negativity of 'Ga' is higher than 'Al'.
 - iv. Atomic radii go on increasing while moving top to bottom in a group.
- b) Explain why zinc sulphate salt is colorless whereas copper sulphate salt is colorful in nature. Why are transition elements mostly 7

- paramagnetic? Explain. 3
3. a) Differentiate between enantiomers and diasteriomers with examples. 7
What are carbocations? 3° carbocations are more stable than 2° carbocations why? 3
- b) What are elimination reactions? Write the mechanism of E_2 reaction giving suitable example. 8
4. a) Write the mechanism of addition polymerization with example. Give the preparation, properties and uses of nylon 66. 7 4
- b) Show your acquaintance on: 8
i. Vulcanization of rubber
ii. Nylon 6,6.
5. a) Write the procedure involved in TLC. How many NMR signals would you expect in following compounds: 8 5
i. $CH_3 - O - CH_3$
ii. CH_3CH_2OH
- b) How cement can be manufactured? Write the stepwise chemical reaction involved during setting of cement. 7
6. a) Define water pollution. Mention and explain the causes and effects of water pollution. What can be done to control it? 7 6
- b) What are green house gases? How are these gases responsible for global warming? Explain the effects of global warming and how can it be controlled? 8
7. Write short notes on: (Any two) 2×5 7
a) Electrochemical series
b) Determination of hardness of water.
c) Bakelite.