UNIVERSITY OF THE PUNJAB

B.S. 4 Years Program / Eighth Semester – Spring 2022

Roll No. .....

Paper: Analytical Chemistry (Sp. Theory-I) **Course Code: CHEM-431** **Time: 3 Hrs. Marks: 60**

THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED

Q.1. Write short answers to the following questions. (15x2=30)

i. What are three basic mechanisms of mass transport in voltametry?
ii. Differentiate between cathodic current and anodic current in polarography.
iii. Describe the role of inert supporting electrolyte in polarography.
iv. How sputtering takes place in glow discharge?
v. Automation possesses some disadvantages. Describe them.
vi. Write down the principle of amperometry.
vii. How glow discharge atomization takes place?
viii. Distinguish between fixed automation and flexible automation.
ix. How conductance is measured?
x. Write down the basic principle of conductometric titrations.
xi. Give disadvantages of anodic stripping voltammetry.
xii. Distinguish between migration current and residual current.
xiii. Describe amperometric titrations involving electro-reducible vs electro-oxidiseable species.
xiv. What is difference between arc and spark?
xv. What is the effect of charge and size of ions on conductivity?

Q.2. Write detailed answers to the following questions. (6x5=30)

i. Discuss arc and spark sources.
ii. Explain how conductometric titrations are applied in complexometric and participations reactions.
iii. Discuss instrumentation in amperometric titrations.
iv. Discuss the construction and working of voltametric cell.
v. Discuss in detail the factors affecting the limiting current.
vi. Polarography is applied to organic and inorganic substances. Explain it details.

UNIVERSITY OF THE PUNJAB

B.S. 4 Years Program / Eighth Semester – 2020

Roll No. .....

Paper: Analytical Chemistry (Sp. Theory-I)

Course Code: CHEM-431 Part – II

Time: 2 Hrs. 45 Min. Marks: 50

ATTEMPT THIS (SUBJECTIVE) ON THE SEPARATE ANSWER SHEET PROVIDED

Q.2. Give short answers to the following questions. (10x2=20)

i - What is the effect of dilution on Specific conductance? Give reason also.
ii- What is the basic principle of Anodic stripping voltammetry?
iii- What is Ilkovich equation? Give its significance.
iv- Give application of conductometry in precipitation titrations?
v- Give difference between molar conductance and specific conductance?
vi- What do you mean by cyclic voltammetry?
vii- Give the changes in conductance in the titration of mixture of HCl and acetic acid with NaOH?.
viii- What is cell constant? What is relation between conductivity of cell and cell constant?
ix- What different arc and spark sources used in spectroscopy?
x- Give three advantages of DME?

Answers to the following questions. (3x10=30)

Q.3 (a) Discuss quantitative applications of anodic stripping voltammetry. (5)

(b) Write a note on conductometric titrations of strong acid with NaOH and NH_4OH. (5)

Q.4 (a) Discuss electrodeposition step and voltammetric completion step in voltammetry. (5)

(b) Discuss half wave potential. What information is obtained from polarographic curve? (5)

Q.5- (a) Write a note on spark sources. (5)

(b) Write note on Qualitative aspect of polarographic analysis (5)

UNIVERSITY OF THE PUNJAB

B.S. 4 Years Program / Eighth Semester – 2019

Roll No. .....

Paper: Analytical Chemistry (Sp. Theory-I)

Course Code: CHEM-431 Part – II

Time: 2 Hrs. 45 Min. Marks: 50

ATTEMPT THIS (SUBJECTIVE) ON THE SEPARATE ANSWER SHEET PROVIDED

Section I

Q.2- Attempt all Short questions (2x10=20)

I – What is the effect of temperature on conductance of solution?

ii-. How sputtering takes place in glow discharge?

Iii-.Give the differences between arc and spark.

iv-How oxygen interferes in polarographic analysis ?

v-Distinguish between specific conductance and molar conductance.

vi- What do you know about residual current in polarography?

vii- What are the advantages and disadvantages of conductometric titrations?

viii Give the characteristic of supporting electrolyte to be used in polarography.

ix- Write down the basic principle of glow discharge technique?

x-. What are the limitations of Amperometry ?.

Section II

Attempt all questions

Q.3(a)-write down the principle and instrumentation of electrical arcs. (5)

(b)-. What is meant by diffusion current ? Discuss factors affecting it. (5)

Q.(4)-(a). Explain conductometric titrations involving

(I) Strong acid with strong base

(ii)Weak acid with strong base (5)

(b) Discuss the applications amperometry? (5)

Q.5- (a) Discuss anodic stripping voltametry. (5)

(b)- . Discuss various types of electrodes in polarography. (5)

UNIVERSITY OF THE PUNJAB

Eighth Semester - 2017
Examination: B.S. 4 Years Programme

Roll No. .....

PAPER: Analytical Chemistry (Sp. Theory-I)
Course Code: CHEM-431

TIME ALLOWED: 2 hrs. & 30 mins.
MAX. MARKS: 50

Attempt this Paper on Separate Answer Sheet provided.

SUBJECTIVE

Section I

Q.2- Attempt all Short questions (2x10=20)

(i) – What is meant by arc and spark ablation?

(ii) -. What are the advantages of amperometric titrations?

(iii) –What do you know about polarographic maxima.

(iv) – How oxygen interferes in polarographic analysis? How the problem is overcome?

(v) How sputtering takes place in glow discharge cells?

(vi) Describe briefly the two steps in stripping voltametery?

(vii) –Describe the two factors that contribute to the electrochemical reactions in polarography.

(viii) What are the advantages of conductometric titrations over ordinary titrations?

(ix) How conductance of solution changes under the influence of temperature and concentration of ions?

(x) Give difference between Specific conductance and molar conductance.

Section II

Attempt all questions

Q.3(a)-. Explain the following conductometric titrations

(i)Mixture of strong acid and weak acid with strong base

(ii)Precipitation titration.. (5)

(b)- Discuss the types of amperometric electrode system. (5)

Q.(4)-(a)Explain instrumentation in polarography. (5)

(b). Discuss glow discharge mechanism and give it's applications in chemistry (5)

Q.5- (a) Explain How conductance is measured? (5)

(b)- Discuss the applications of anodic stripping votametry (5)

UNIVERSITY OF THE PUNJAB

B.S. 4 Years Program / Eighth Semester – Spring 2023

Roll No. .....

Paper: Environmental Chemistry Course Code: CHEM-402 Time: 3 Hrs. Marks: 60

THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED

Q.1. Answer the following short questions. (15x2=30)

1. Mention the percentage of organic and inorganic components of a typical fertile soil.
2. What is HUMUS?
3. Which analytical technique is suitable for analysis of heavy metals in the environment?
4. What are main types of soil erosion?
5. Mention the names of fungi which are producing AFLATOXINS?
6. Enlist micronutrients of plants.
7. What is littering?
8. Enlist any two sources of soil pollution.
9. Where does the term SOIL come from?
10. What is soil texture?
11. What is CEC of the soil?
12. What is dirty dozen?
13. What are PCBs?
14. Mention any two applications of IR spectroscopy in environmental monitoring.
15. What is ATOM ECONOMY in Green Chemistry?

Q.2. Answer the following questions. (5x6=30)

1. Describe the SOLID components of soil.
2. How INDUSTRIES are contributing in soil pollution?
3. What are POPs? How these are affecting the environment?
4. Elaborate any six importance of GREEN CHEMISTRY.
5. Write a brief note on GC.

UNIVERSITY OF THE PUNJAB

B.S. 4 Years Program / Eighth Semester – Spring 2023

Roll No. .....

Paper: Analytical Chemistry (Sp. Theory-II) Course Code: CHEM-432 Time: 3 Hrs. Marks: 60

THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED

Q.1. Answer the following short questions. (15x2=30)

i. How Fourier transform (FT) - NMR is better than Continuous Wave (CW) - NMR?

ii. Mass spectrometry is different from other spectroscopic methods. How?

iii. How a mixture of substances can be analysed by using mass spectrometry?

iv. How array detector works in mass spectrometry?

v. What are metastable ions?

vi. What is population inversion in laser?

vii. What is the difference between single focusing and double focusing analyzer?

viii. what is meant by chemical shift?

ix. What is shielding and deshielding in NMR?

x. Briefly, describe the applications of ruby laser.

xi. Write down different parts of NMR Spectrometer?

xii. Describe optical resonator as laser system component.

xiii. What is spin-lattice relaxation process?

xiv. Give some advantages of laser.

xv. Why four laser system is better than three system?

Answer the following questions. (3x10=30)

Q no 2:

(a) Discuss the quadrupole mass analyzer.

(b) Describe the McLafferty Rearrangement with suitable example.

Q no 3:

(a) Describe different factors affecting coupling constant.

(b) Discuss the principle of NMR.

Q no 4:

(a) Write down the construction, working and applications of dye laser.

(b) Discuss the characteristics of laser light?

UNIVERSITY OF THE PUNJAB

B.S. 4 Years Program / Eighth Semester – 2020

Roll No. .....

Paper: Environmental Chemistry
Course Code: CHEM-402 Part – II

Time: 2 Hrs. 45 Min. Marks: 50

ATTEMPT THIS (SUBJECTIVE) ON THE SEPARATE ANSWER SHEET PROVIDED

Q.2. Answer the following short questions. (10x2=20)

1. Toxicity of Cr is attributed to Cr(IV) not to Cr(III). Why?
2. What is **CEC**? Why soil can hold only cations?
3. what are major causes of soil erosion?
4. What are aflatoxins?
5. Discuss control measures for water erosion.
6. Differentiate between macro and micro nutrients in soil.
7. Describe the principle of UV-visible spectroscopy.
8. Discuss the main sources of lead in environment.
9. Why PCBs were banned?
10. What is atom economy?

Q.3. Answer the following Questions (5x6=30)

1. What is soil pollution? What are major causes of soil pollution?
2. Briefly discuss persistent organic pollutants.
3. Discuss principle of HPLC and its application in environmental monitoring.
4. Briefly describe the composition of a typical soil.
5. Write a note on legislation aspects of environmental pollution.

UNIVERSITY OF THE PUNJAB

B.S. 4 Years Program / Eighth Semester – Spring 2022

Roll No. .....

Paper: Environmental Chemistry **Course Code: CHEM-402** **Time: 3 Hrs. Marks: 60**

THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED

Q.1. Write short answers to the following questions. (15x2=30)

1. What is HUMUS?
2. How soil air is important for fertility?
3. Suggest some control measures for WATER erosion.
4. What type of pollutants can be analyzed by AAS.
5. What's meant by AFLATOXINS?
6. How availability of Phosphorous is affected by soil pH?
7. What is chemical speciation?
8. Propose the reclamation of Basic soil.
9. What in principle of UV spectroscopy?
10. Mention the salient feature of HPLC.
11. What are primary & secondary minerals of soil?
12. What are limitations of GC?
13. What is DIRTY DOZEN?
14. Where is the word SOIL from?
15. What is importance of clay in nutrient holding capacity of soil?

Q.2. Write detailed answers to the following questions. (5x6=30)

1. Describe the LIQUID and GASEOUS components of soil.
2. How MINING is contributing in soil pollution?
3. Write down the salient features of POPs?
4. Describe any six principles of GREEN chemistry.
5. Describe the importance of SPECTROSCOPIC techniques in environmental monitoring.