

B.Sc. (Semester – VI) Examination, April/May 2019
CHEMISTRY (Paper – IV) (6 units)
Analytical Chemistry

Duration : 2 Hours

Total Marks : 80

- Instructions :** 1) **All questions are compulsory.**
2) **Figures to the right indicate full marks.**
3) **Answers to the two Sections should be written on separate answer books.**
4) **Use of non programmable calculator is allowed.**

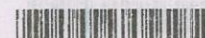
SECTION – I

(40 Marks)

1. Answer the following questions (**any four**). **(4×4=16)**
- i) Classify any four chromatographic techniques based on adsorption and partition type.
 - ii) What makes GC – MS is an advance technique of analysis ?
 - iii) With a neat diagram, explain the working of a Double beam photoelectric colorimeter.
 - iv) State Beer – Lambert's law. Write an expression (No derivation). Give its one limitation.
 - v) What are photometric titrations ? How can they be used for end point determination ?
 - vi) Describe ascending paper chromatography.
2. A) With a neat diagram, explain the instrumentation of GC. **6**
- OR
- A) i) Discuss the principles and classification of ion exchange resins in IEC. **4**
ii) What are the advantages of TLC over Paper chromatography ? **2**
- B) i) How does Thermal Conductivity Detector works ? **4**
ii) In a planar chromatography, solvent front was 18 cms. The front of components A, B, C and D were 16.6, 14.3, 1 and 5.7 cms respectively. If the R_f value of the unknown is 0.79, identify the compound. **2**
3. A) i) How UV-Visible spectroscopy is used to find metal to ligand ratio in a complex ? **4**
ii) Any two advantages of grating over prism monochromators. **2**

OR

RDN - 20



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| A) iii) Write a note on grating monochromator. | 4 |
| iv) A solution having molar absorptivity of 14,000 gives an absorbance of 0.85 in a cell of 1cm thickness. Calculate the concentration and percent transmittance. | 2 |
| B) i) Name the sources of UV, IR and UV light in a spectrophotometer. | 2 |
| ii) Describe the techniques of column chromatography. | 4 |

SECTION - II

(40 Marks)

4. Answer **any 4** of the following.

(4×4=16)

- i) Explain the working of junction diode in forward biased and reverse biased mode.
- ii) What are rectifiers ? Explain the working of full wave rectifier.
- iii) Explain the effect of various functional groups on fluorescence.
- iv) Explain briefly the importance of each unit of the TGA instrument.
- v) Explain how ozone in air is analysed.
- vi) How Fe is analysed in soil sample ?

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| 5. A) i) Explain the working of NPN transistor. | 4 |
| ii) How is pH of the soil determined ? | 2 |

OR

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| A) iii) Explain the function of diode in Bridge Rectifier. | 4 |
| iv) How is bulk density of soil determined ? | 2 |
| B) i) Mention the requirements for a good thermo-balance to be used in TGA. | 4 |
| ii) Convert 101011 into decimal number. | 2 |

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| 6. A) i) How will you determine the volume of blood by isotope dilution analysis technique ? | 4 |
| ii) State any two applications of DTA. | 2 |

OR

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| A) iii) Explain the principle involved in neutron activation analysis. | 4 |
| iv) Give any two applications of fluorimetry. | 2 |
| B) i) With the help of neat labelled diagram, explain the working double beam fluorimeter. | 4 |
| ii) Give the symbolic representation of bipolar junction transistor in CC and CB mode. | 2 |