

M. SC. CHEMISTRY EXAMINATION, 2018

(4th Semester)

ANALYTICAL CHEMISTRY SPECIAL

PAPER - XIV-A

Time : Two hours

Full Marks : 50

(25 marks for each unit)

Use a separate answerscript for each unit.

UNIT - A - 4141

Answer *any five* of the following questions :

1. i) Explain the importance of reporter molecules and isosbestic points for the analysis of bio-molecules using absorption spectroscopy.
- ii) What is solvent perturbation experiment ? (2+2)+1
2. i) What do you mean by hypochromicity of nucleic acid ?
How is melting point of DNA calculated using absorption spectra ?
- ii) Comment on the detection of corresponding enzymes based on the chromogenic substance from the product of p-Nitrophenyl phosphate and 3, 5, 3', 5' - tetramethylbenzidine.

(2+1)+(1+1)

[Turn over

[2]

3. Write down the various mechanism for the sensing of bio-molecules using fluorescence quenching experiments. Using proper equation and example explain about the selectivity and sensitivity of the sensing experiments.

3+2

4. Describe the estimation of vitamin B1 in food stuffs using fluorimetric method in the following order – principle, materials, extraction, procedure and calculation.

5. Write down the estimation of chlorophyll a, chlorophyll b and total chlorophyll from a leaf using suitable centrifuge and spectroscopic technique. 5

6. (i) Write down the expression for the calculation of sedimentation rate and explain all the terms.

(ii) What is RCF? Derive an expression for the determination of RCF.

(iii) Write down the importance of preparative and analytical ultracentrifugation. 1+(1+2)+1

[3]

UNIT - A - 4142

Answer *any five* questions.

5× 5=25

7. Discuss what happens when a liquid sample (MX) is aspirated to the flame in flame photometry? Name the various types of interferences in Flame AAS technique? Mention the function of nebulizer in Flame AAS.
8. Describe the principle of hollow cathode lamp (HCL) and electrodeless discharge lamp (EDL). Explain why and when EDL lamp is used in AAS
9. Write short notes on
- i) Chemical Interference in AAS
 - ii) Standard addition method in AAS
10. What is electrothermal atomization or graphite furnace AAS? Discuss the steps involved in GFAAS. Mention the advantages and disadvantages of this technique over flame AAS.
11. Discuss the principle of hydride generation technique over for the estimation of arsenic.
12. Describe the basic principle of Inductively Coupled Plasma Torch.