(2½ Hours) **(Total Marks: 60)**

Please check whether you have got the right question paper.

N.B. : 1) All questions are compulsory

2) Figures to the right indicate full marks.

1. A. Attempt **ANY TWO** of the following:- **(08)**

i) What are membrane processes? Discuss the principle and , applications of ultra-filtration.

ii) What is reverse osmosis? With the help of a neat labelled diagram, explain how it is used to purify brackish water.

iii) Explain the terms in solvent extraction (a) Distribution ratio (b) Percentage extraction (c) Separation factor

iv) Explain the use of solvent extraction ,in sample preparation and pre-treatment steps.

B. Attempt **ANY ONE** of the following:- **(04)**

i) Write a note on 'microfiltration".

ii) Elaborate "Solvent Extraction as a means of analytical determination".

2. A. Attempt **ANY TWO** of the following: **(08)**

i) Define herb and explain preparation of herbal drug.

ii) Explain the principle and working of Soxhlet Extractor.

iii) Write a note on drying and processing of herbal raw materials

iv) What is standardisation of herbal extract? Explain chemical Standardisation of herbal extract.

B Attempt **ANY ONE** of the following: **(08)**

i) Write a note on choice of solvent and properties of good solvent used 'for extraction of herbs.

ii) With the help of neat diagram explain percolation method used for extraction of herbal drugs.

3. A. Attempt **ANY TWO** of the following: **(08)**

i) What are the advantages of super-critical fluids over organic solvents?

ii) Explain the steps taken in designing green process.

iii) With appropriate example of each, explain the terms ‘atom economic reactions’ and ‘atom uneconomic reactions.’

iv) Explain the advantages of microwave technique in chemical synthesis.

B. Attempt **ANY ONE** of the following:- **(04)**

i) Elaborate the various challenges overcome by the use of photochemical reactions.

ii) What are ionic liquids? List the applications of ionic liquids as a solvent.

4. A. Attempt **ANY TWO** of the following: **(08)**

i) What are Nano-materials? How are they classified?

ii) Describe the principle and instrumentation used in capillary, electrophoresis.

iii) Give an account of supporting media used in zone electrophoresis.

iv) Explain the principle and applications of gel electrophoresis.

D8DA2605BD6BEB5F15497F6A13273682

B. Attempt **ANY ONE** of the following:- **(04)**

i) What is zone electrophoresis? Discuss factors affecting the migration rate of molecules in it.

ii) Discuss the principle and applications of SDS-PAGE.

5. Attempt **ANY FOUR** of the following: **(12)**

i) Give details of applications of electro dialysis.

ii) What are the criteria for selection of solvent in solvent extraction?

iii) Explain identification and authentication of herbal materials.

iv) Write a note on qualitative determination of herbal drug.

v) List the principles of green chemistry.

vi) Write the principle and applications of electro-chemical synthesis.

vii) How is the particle size of nanomaterials determined?

viii) Enlist the applications of micellar electro kinetic capillary chromatography.