Q.P. Code :10796

[Time: 2½ Hours] **[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**.
3. **The use of a log table or a non-programmable calculator is permitted.**

Q1 **A** Attempt **Any Two** of the following: **08**

i Discuss the relevance of ASTM with reference to quality testing in chemical industry.

ii What are the fundamental requirements for patenting?

iii List the safety precautions to be taken while storing and handling of highly flammable materials.

iv How important is the usage of standard materials in chemical analysis?

B Write a note in detail on "Pharmacopeia". **04**

OR

B Give the steps involved in the process of patenting. **04**

Q2 **A** Attempt **Any Two** of the following: **08**

i Discuss the classification of the membrane separation processes.

ii Describe the construction and working of multicomponent electro-dialysis unit for desalination of brackish water.

iii Explain in detail the principle of microfiltration.

iv What are microporous and asymmetric membranes?

B Justify the following statement: Automation in instrumental analysis has overcome the limitations of conventional analysis. **04**

OR

B What is the selection criterion for reverse osmosis membrane? **04**

Q3 **A** Attempt **Any Two** of the following: **08**

i What are the advantages of ionic liquids as solvent?

ii With suitable examples explain atom economy and atom non-economy process.

iii Discuss in detail the designing of green processes with reference to "Inherent Safer Design" and Process Intensification.

iv List the advantages of supercritical fluids over organic solvents with respect to green chemistry.

B Explain with suitable examples, the use of sono-chemistry in green chemical syntheses. **04**

OR

B How is atom economy calculated? The following reaction is used as a preparation of acetone from the calcium salt of acetic acid: **04**

$(CH_3COO)_2Ca \xrightarrow{\Delta} CH_3COCH_3+CaCO_3$; Calculate the atom economy of the reaction.
(H=1, C=12,O=16,Ca=40)

Turn over

Q4 **A** Attempt **Any Two** of the following: **08**

i With the emphasis on the method of detection, explain capillary electrophoresis.

ii Discuss the classification of carbon nano-tubes.

iii Explain the principle applications of gel electrophoresis.

iv Give an account of different factors that affect the rate of migration in zone electrophoresis.

B What is micellar electrokinetic capillary chromatography? Give its applications. **04**

OR

B Discuss the principle and instrumentation of SDS page and iso-electric focusing. **04**

Q5 Attempt **Any Four** of the following: **12**

i What are transportation symbols? Give the symbols of any two hazardous codes.

ii What first aid treatment is to be given to the victim for burning due to concentrated acids?

iii State the advantages of ultrafiltration.

iv Discuss the potential applications of inorganic membranes.

v With a suitable example, explain photo-catalysis.

vi Explain the term “sustainable development”.

vii What is the effect of migration rates in capillary electrophoresis?

viii Discuss the optical properties of nano materials.

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