

M.Sc. Sem IV May 2017

Analytical Chemistry P-IV

Q.P. Code :10797

[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:

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- i What are chemical standards and reference materials? What is their importance in chemical analysis?
- ii Enlist the safety precautions to be taken while working in a chemical laboratory.
- iii How are hazardous and corrosive materials stored in chemical laboratories?
- iv Explain the significance of the patented work and its benefits.

B Discuss the first aid methods used in case of accidents in chemical plants.

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OR

B Write a note in detail on "ASTM".

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Q2 A Attempt Any Two of the following:

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- i Explain the mechanism of dialysis.
- ii Discuss application of multi-layer films in determination of potassium ion in serum sample.
- iii What is the basic operating principle behind ultrafiltration?
- iv State the advantages of membrane process.

B What is reverse osmosis? What are its advantages?

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OR

B Describe the operation of flow injection analysis system for the determination of chloride ion in water sample.

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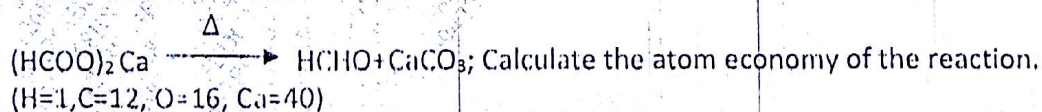
Q3 A Attempt Any Two of the following:

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- i How ionic solids are "green" and "sustainable"?
- ii State the advantages of photochemical reactions in emerging green technologies.
- iii Explain with a suitable example, the terms Inherently Safer Design (ISD) and Process Intensification (PI).
- iv State the advantages of CO₂ as a supercritical fluid.

B Why is atom economy calculated? The following reaction is used as a preparation of methanal from the calcium salt of formic acid:

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OR

B With the help of suitable examples, explain the use of microwave methods as a green way of chemical syntheses.

04

Turn over

08

04

04

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Q4 A Attempt Any Two of the following:

- i Discuss in detail the morphology of nano particles.
- ii Explain the principle of SDS PAGE, and discuss its instrumentation and applications.
- iii What is the principle of gel electrophoresis? State its applications.
- iv Write a note on capillary isotachopheresis.

B Discuss the following methods of detection in capillary electrophoresis: Absorption and fluorescence.

OR

B Give a detail account of Micellar Electrokinetic Capillary chromatography.

Q5 Attempt Any Four of the following:

- i What first aid treatment is given the victim for burning due to caustic alkalies?
- ii Explain with suitable examples the term "Transportation Symbols".
- iii What are the advantages of flow injection analysis due to absence of air bubble?
- iv Discuss cross flow microfiltration.
- v State the application of microwave synthesis in green chemistry.
- vi With suitable examples, discuss the role of ionic liquids as catalysts.
- vii How do we define gels on the basis of their composition?
- viii Give a brief account of three dimensional nano particles.