



বিদ্যাসাগর বিশ্ববিদ্যালয়
VIDYASAGAR UNIVERSITY
Question Paper

B.Sc. Major Examinations 2021
(Under CBCS Pattern)
Semester - III
Subject : INDUSTRIAL CHEMISTRY
Paper : C 5 - T & P
(Chemo Metrics and Industrial Chemical Analysis Techniques)

Full Marks : 60 (Theory : 40 + Practical : 20)
Time : 3 Hours

*Candidates are required to give their answers in their own words as far as practicable.
The figures in the margin indicate full marks.*

(Theory)

Group - A

A. Answer any **three** of the following questions : 12×3=36

1. (a) Define accuracy and precision. (b) What is the difference between accuracy and precision? (c) What do you mean by the term 'relative error'. (d) The results of an analysis are 36.97 g, compared with accepted value of 37.06g. What is the relative error in parts per thousand? 3+2+2+5
2. Describe the principles of flame emission spectroscopy and atomic absorption spectroscopy. What is nebulization in Atomic Absorption Spectroscopy? (5+5)+2

3. Describe the basic principle of mass spectrometry. Discuss the process of electron ionization and chemical ionization mass spectrometry. What is McLafferty Rearrangement?
4+(3+3)+2
4. Explain the following terms/topics related to Electron Spin Resonance (ESR) : (a) Basic principle of ESR (b) Zeeman effect (c) Spin-orbit interaction (d) g-factor.
4×3
5. Describe the basic principle of electrophoresis. Write down the principle and applications of neutron diffraction analysis.
5+(4+3)
6. Write down applications of Raman spectroscopy. Explain the terms Raman scattering and Rayleigh scattering. Which among the following is Raman active and why : CO₂, H₂O, Cl₂.
4+5+3

Group - B

B. Answer any *two* of the following questions : 2×2=4

1. Calculate the mean and standard deviation of the following set of analytical result : 15.67, 15.69 and 16.03g.
2. Write a short note on hollow-cathode lamp.
3. Why ICP-MS is better than AAS?
4. Describe the basic principle of X-ray fluorescence spectroscopy.

(Practical)

Paper - C 5 P

(Chemo Metrics and Industrial Chemical Analysis Techniques)

Marks : 20

Group - A

A. Answer any *one* of the following question : 15×1=15

1. Discuss the process of determination of pKa value of phenolphthalein indicator using a spectrophotometer.

2. Discuss the process of determination of calcium, iron and copper in food by Atomic Absorption Spectroscopy.
3. Write down the procedure of determination of the concentration of Na^+ and K^+ using a flame photometer.

Group - B

B. Answer any **one** of the following question :

5×1=5

1. Write short note on IR absorption spectra of aldehyde and ketones.
 2. Explain the process of determination of caffeine in soft drink using a spectrophotometer.
 3. Discuss the instrumentation of Nuclear Magnetic Resonance.
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