

PE-495
(534) M.Sc. Chemistry (Fourth Semester)
Examination June 2022
Compulsory/Optional
ANALYTICAL CHEMISTRY
Paper-IV

Time: Three Hours

Maximum Marks: 080

Minimum Passing Marks:

Note: Answer from both section as directed. The figures in the right-hand margin indicate marks.

SECTION-A

1. Answer the following questions:-

[1 X 10 = 10]

- (a) Write the structural formula of Benzidine.
- (b) Write the names of electrical methods generally used in Analytical chemistry.
- (c) What are the different ways of expressing an error?
- (d) Find the arithmetic mean of first five natural numbers.
- (e) How percentage of protein (Casein) content in butter calculated?
- (f) What properties are analysed in food?
- (g) What is the major cause of water-borne diseases in Chhattisgarh?
- (h) What is the indication of increased biological oxygen demand (BOD) in Water sample?
- (i) Which instrument is used for the estimation of potash?
- (j) Write names of gases present in producer gas.

2. Answer the following questions:-

[2 X 5 = 10]

- (a) What are the fundamental differences in between physical balance and a chemical balance?
- (b) What are characteristics of medium?
- (c) What are different forms of water in foods?
- (d) Calculate the BOD of a water sample which contains one gram of urea for every 100 liter of water. The reaction between urea and oxygen is-
$$\text{NH}_2\text{CONH}_2 + 4\text{O}_2 \rightarrow \text{CO}_2 + 2\text{NO}_3^- + 2\text{H}^+ + \text{H}_2\text{O}$$
- (e) How to fix a zinc deficiency in plants?

SECTION-B

[12 X 5 = 60]

Answer the following questions:-

UNIT-I

3. What is analytical chemistry and its role? Classify analytical methods and describe the selection of analytical methods?

Or

What do you mean by laboratory note book? How can you maintain it in the Laboratory? What is precipitation? Describe procedure for efficient precipitation.

UNIT-II

4. Differentiate between:-

- (a) Accuracy and Precision
- (b) Indeterminate and determinate error.
- (c) Confidence Limit and Confidence Level.

Or

What do you mean by mean and median? In a compound XY the percentage of X was found to be 25.12, 25.26, 25.34, 25.38, 25.40. Calculate mean deviation and relative mean deviation.

UNIT-III

5. Write short notes on thin layer chromatography for identification of chlorinated pesticides in food products.

Or

Explain the following:-

- (a) Analysis of Phosphorus.
- (b) Analysis of Potassium.
- (c) Harmful effects of food adulterants.

UNIT-IV

6. Describe the method for the determination of hardness and phosphate in water sample.

Or

Explain the origin of waste water, types of water and water pollutants & their effects.

UNIT-V

7. Write the methods of analysis of moisture sulphur, PH and alkali salts in soil

Or

Write notes on the following:-

- (a) Fuel analysis.
- (b) Octane Number.
- (c) Aniline point of liquid fuels.