

Roll No. : .....

Total No. of Questions : 11 ]

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# **BPG-1093**

**M.Sc. (Previous) Examination, 2021**

**CHEMISTRY**

**CH-404**

Paper - IV

**(Analytical Chemistry)**

*Time : 1½ Hours ]*

*[ Maximum Marks : 75*

**Section-A**

**(Marks : 2 × 10 = 20)**

*Note :-* Answer all *ten* questions (Answer limit **50** words). Each question carries **2** marks.

**Section-B**

**(Marks : 5 × 5 = 25)**

*Note :-* Answer all *five* questions. Each question has internal choice (Answer limit **200** words). Each question carries **5** marks.

**Section-C**

**(Marks : 10 × 3 = 30)**

*Note :-* Answer any *three* questions out of five (Answer limit **500** words). Each question carries **10** marks.

**Section-A**

2 each

1. (i) How carbonyl functional group is determined ?
- (ii) What are Antimicrobial agents ?

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- (iii) What is importance of ion selective electrode ?
- (iv) Mention the basis of differential scanning calorimetry.
- (v) Give major resonance lines of sodium atom spectra.
- (vi) Define Anger Electron.
- (vii) Why fingerprint region in IR spectra is useful ?
- (viii) How Fourier Transform (FT) is better than conventional spectra ?
- (ix) Write *two* Bragg's condition.
- (x) What are Miller indices ?

**Section-B**

5 each

2. Explain the role of preservatives with examples.

*Or*

Write a short note on Food Standards.

3. Describe, how redox active compounds can be characterized by cyclic voltammetry ?

*Or*

How qualitative and quantitative analysis is done Thermogravimetric Analysis (TGA) ?

4. Discuss the process involved in radiative and non-radiative decay.

*Or*

Discuss the role of ESCA in structure determination of organic compounds.

5. Describe the principle of IR spectrophotometry with regards to its wide extensive applications.

*Or*

Explain, how Raman Spectroscopy is useful in structure determination ?

6. What is the significance of Ramchandran diagram ?

*Or*

Enumerate the principle of LEED in structure determination.

**Section-C**

7. (a) Write explanatory note on protocol for analysis of standard drugs.  
(b) How is the following water analysis done ?  
(i) Dissolved Oxygen (DO) 5,5  
(ii) Hardness of Water 5,5
8. Draw a labelled diagram of Differential Thermal Analysis (DTA) instrument and explain its working. 10
9. (a) Discuss the principle of Photoacoustic Spectroscopy. 5,5  
(b) What do you understand by Photoelectron spectra ?
10. (a) Illustrate the following concepts of NMR :  
(i) Chemical shift  
(ii) Shielding and deshielding  
(b) Give *two* applications of microwave spectroscopy. 6,4
11. (a) Write explanatory note on X-ray analysis of a crystal.  
(b) What is the basic principle of electron diffraction ? 6,4