

92278

B.Sc. 4th Semester (New Scheme)

Examination, May-2023

BIO-TECHNOLOGY

Paper- BT-407

Inorganic Chemistry

Time allowed : 3 hours]

[Maximum marks : 40

Note : Attempt five questions in all, selecting one question from each section. Q. No.1 is compulsory. All questions carry equal marks.

Compulsory Question

1. (a) Write the general electronic configuration of lanthanides. 1
- (b) Why lanthanides do not form oxocations? 1
- (c) What are transuranic elements? 1
- (d) Name two minerals of uranium. 1
- (e) What is solubility product? 1
- (f) Write one chemical test-for detection of borate. 1
- (g) Name the basic radicals of group IV. 1
- (h) What is seedling or nucleation? 1

Section-A

2. (a) What are lanthanides? Why they have poor tendency to form complexes? 4

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- (b) What is lanthanide contraction? Explain its effect on the basic strength of hydroxides. 4
3. (a) What are double salts of lanthanides? 2
- (b) Out of Gd_2O_3 and YbO , which is more basic and why? 2
- (c) Why lanthanides show similar chemical behavior? Explain the ion exchange method for separation of lanthanides. 4

Section-B

4. (a) Give reason: 2,2
- (i) Actinides form oxocations
- (ii) It is difficult to interpret the paramagnetic behavior of actinides
- (b) Differentiate between actinides and lanthanides. 4
5. (a) What is actinide contraction? How it is different from lanthanide contraction? 4
- (b) Explain the chemistry of separation of Np, Pu and Am from uranium. 4

Section-C

6. Explain the chemistry of two tests for the following: 4,4

- (i) Thiosulphates
 - (ii) Phosphates
7. Explain the detection of: 4,4
- (i) Oxalate in the presence of carbonate
 - (ii) Carbonate in the presence of sulphites

Section-D

8. (a) Describe the importance of common ion effect in qualitative analysis. 4
- (b) Discuss the factors affecting solubility of precipitates. 4
9. (a) Describe the chemistry of separation and confirmation of Fe^{3+} , Cr^{3+} and Al^{3+} . 6
- (b) Differentiate between co-precipitation and post precipitation. 2