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# 92278

## B. Sc. (Bio-Technology) 4th Sem. Examination – May, 2017

### INORGANIC CHEMISTRY

**Paper : BT-407**

*Time : Three Hours ]* *[ Maximum Marks : 40*

*Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.*

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

1. (a) Out of $La^{3+}$ and $Ce^{3+}$, which is paramagnetic ?

   (b) Name *two* tripositive lanthanide ions which are colourless.

   (c) What is the oxidation state of Uranium in $UO_2^{2+}$ ?

(d) Name the most important are of Uranium.

(e) What is the group reagent for basic radicals of group V ?

(f) What happens when Tin (II) chloride is added to Mercury (II) chloride ?

(g) Name the basic radicals of group IV.

(h) What do you mean by seeding or nucleation ?

$1 \times 8 = 8$

## SECTION – A

**2.** (a) Why do lanthanides shows similar chemical behaviour ? 3

(b) Why Europium (II) is more stable than Cerium (II) ? 2

(c) Lanthanides have a poor tendency to form complexes. Explain. 3

**3.** (a) Explain the ion-exchange method for separation of lanthanides. 3

(b) What are double salts of lanthanides ? 2

(c) What is the effect of lanthanide contraction on basic strength of lanthanide hydroxides. 3

## SECTION – B

4. (a) Compare the lanthanide contraction with actinide contraction. Which one is more dominating ? 4

(b) Describe briefly the method of separation of Np, Pu and Am from uranium. 4

5. (a) What are trans-uranic elements ? 2

(b) Describe the main points of differences between lanthanides and actinides. 3

(c) Why actinides forms oxocation but lanthanides do not ? 3

## SECTION – C

6. (a) Write the chemistry of two tests for the following :
(i) $S^{2-}$ (ii) $CO_3^{2-}$ 4

(b) How will you detect chloride, bromide and iodide in presence of each other ? 4

7. (a) Write the reaction involved in detection of : 4

(i) Nitrate by ring test

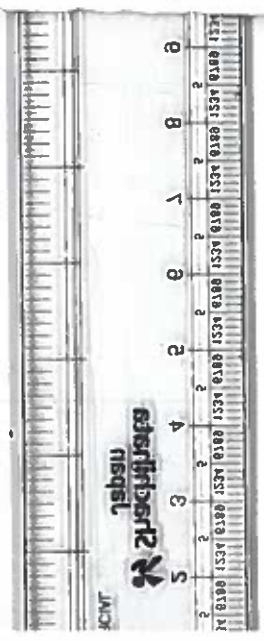
(ii) Chloride by Chromyl test

(b) $H_2S$ gas is passed in acidic medium to precipitate radicals of group II. Explain. 4



$Na_2CO_3 + H_2SO_4 \longrightarrow$ 54

$(NH_4)_2CO_3$



## SECTION – D

**8.** (a) Differentiate co-precipitation and post-precipitation. 4

(b) What is solubility product ? Discuss its applications in qualitative analysis. 4

**9.** (a) Describe : 4

(i) Common ion effect

(ii) Digestion

(b) Write the chemistry of two test of following : 4

(i) $Mn^{2+}$

(ii) $Sr^{2+}$