

41201

Roll No.

7. (a) Explain the chemistry of chromyl chloride test. 3

(b) What happens when : 3

(i) Ferric chloride solution reacts with $K_4[Fe(CN)_6]$ solution ?

(ii) Tin(II) chloride is added to mercury(II) chloride ?

SECTION - D

8. Give main differences between : $3 \times 2 = 6$

(a) Co-precipitation and post-precipitation

(b) Digestion and warming the precipitates

(c) Solubility product and ionic product

9. How will you distinguish between : $3 \times 2 = 6$

(a) NO_2^- and NO_3^-

(b) SO_4^{2-} and $S_2O_3^{2-}$

(c) CO_3^{2-} and $C_2O_4^{2-}$

(4)

41201

B. Sc. (Pass Course) 4th Semester

Examination – May, 2019

CHEMISTRY - I (Inorganic Chemistry)

Paper : CH-401

Time : Three hours / Maximum Marks : 29

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 Number **1** is *compulsory*. All questions carry equal marks.

1. Compulsory Questions : $5 \times 1 = 5$

(a) Name the three tripositive lanthanide ions which are colourless.

(b) Why is Eu(II) more stable than Ce(II) ?

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- (c) Actinides have greater tendency to form complex than lanthanides. Explain.
- (d) Why is H_2S gas passed through solution in acidic medium to precipitate second group radicals ?
- (e) Which complex is formed when NO_2 gas reacts with $FeSO_4$ to form black solution ? Discuss the reaction.

SECTION - A

2. (a) Amongst La(57), Sm(62), Gd(64) and Yb(70) : 3
- (i) Which element will give coloured ion ?
- (ii) Which element will give paramagnetic ion ?
- (iii) What are possible oxidation states ?
- (b) Write short notes on : 3
- (i) Lanthanide Contraction
- (ii) Ion exchange method for separation of lanthanide
3. Give the suitable reasons for the following : 6
- (i) Yb, Ho and Er occur together in natural minerals
- (ii) Eu and Yb have lower melting point and boiling point as compared to other lanthanide elements

(2)

- (iii) Lanthanide ions are expected to form ionic compounds.

SECTION - B

4. Explain the following in case of actinides : 3 × 2 :
- (i) Oxidation state
- (ii) Magnetic properties
- (iii) Actinide contraction
5. (a) Explain why heavier members of the actinide series do not form oxocations.
- (b) Giving two examples, describe the method of preparation of transuranium elements through transmutation with high energy particles.

SECTION - C

6. (a) How is Ni detected in the presence of Co ? Describe the theory of the process. 3
- (b) Give the chemistry of the following tests in qualitative inorganic analysis : 3
- (i) Dilute H_2SO_4 test
- (ii) Concentrated H_2SO_4 test

(3)