# M.Sc. 2nd Semester Examination, 2021

## CHEMISTRY

## (Inorganic Chemistry Practical)

## Paper : CHEM 204C (PR)

## Course ID: 21464

**Time: 2 Hour** **Full Marks: 40**

*The figures in the right hand side margin indicate full marks.*
*Candidates are required to give their answers in their own words as far as practicable*

1. Answer *any four* of the following questions: 10×4=40

(a) (i) Write down the structure of bis-(N, N' disalicylalethylenediamine)-μ-aquadicobalt(II). What is the colour of the complex? How do you synthesized bis-(N, N' disalicylalethylenediamine)-μ-aquadicobalt(II) complex in the laboratory.

(iii) If you take 1.5 gram of $CoCl_2$ with equivalent amount of the ligand for the synthesis of the above mentioned complex and your yield percentage is 52 %. Then calculate the yield in grams. 2+1+5+2=10

(b) (i) How do you synthesized N, N' disalicylalethylenediamine in the laboratory? Write down the balance equation of the reaction?

(ii) What is the role of conc. $H_2SO_4$ in the synthesis of tris(acetylacetonato) Vanadium(IV) complex? (5+2)+3=10

(c) (i) Give an example of a binuclear mixed valance complex of manganese ($Mn^{3+}/Mn^{4+}$).

(ii) How do you synthesize tris(acetylacetonato) manganese(III) complex in the laboratory. Write down the balance equation of reaction. Why do you add potassium permanganate in this synthesis? 2+4+2+2=10

(d) How do you synthesize $[Mn_{12}O_{12}(MeCO_2)_{16}(H_2O)_4]$ complex in the laboratory? Why do you add potassium permanganate in this synthesis? Write down the balance equation of reaction. 5+2+3=10

**Please Turn Over**

(e) (i) What do you mean by tautomers? Give two important uses of metal acetylacetonates. Draw the keto-enol forms of acetyl acetone. What happens when base is added to acetyl acetone?

(ii) What is the geometry of iron acetylacetonate complex? Write down the balanced equation for the formation of the complex. Mention its colour.

(2+2+1)+(2+1+2)=10

(f) (i) How do you synthesized N, N' disalicylalethylene-diamine)- manganese(III)chloride complex in the laboratory. Write down the balanced chemical equation.

(ii) If you take 1 gram Copper(II) chloride ($CuCl_2.6H_2O$) for the synthesis of tris(acetylacetonato) Copper(II) Complex in the laboratory and the yield is 0.560 gm. Calculate the yield percentage. (4+2)+4=10