HCH-1384-85-86-87 Seat No._____

M. Sc. (Sem. IV) Examination

April / May – 2015

Chemistry : Paper - III

(1) CHN-703(O) : Organic Chemistry
(2) CHN-703(I) : (Inorganic Chemistry) (Corrosion)
(3) CHN-703(P) : Physical Chemistry
(4) CHN-703(I) : Coordination Chemistry

Time : 3 Hours] [Total Marks : 70

(1) CHN-703(O) : Organic Chemistry

1 (a) Answer any two of the following : 8
(i) Give the synthesis of any two 9-amino acridines and their physiological activity.
(ii) Write a note on primary tubercular agents.
(iii) Give the classification of antiviral drugs and synthesis of any one antiviral drug.

(b) Answer any one of the following : 6
(i) Write a brief account on antifungal drugs.
(ii) Write a note on antileprotic drugs.

2 (a) Answer any two of the following : 8
(i) Explain Hollucinogenic drugs.
(ii) Write a note on antianxiety drugs.
(iii) Explain antiparkinsonism drugs.

(b) Answer any one of the following : 6
(i) What are sedative and hypnotics ? Explain the relationship between their chemical structure and sleep promoting activity.

(ii) Differentiate general and local anaesthetics. Discuss the mechanism of general anaesthetics. Give the characteristics of an ideal anaesthetic agents.

3 Answer any two of the following : 14

(i) Explain β-Adrenergic blocking agents and cardiovascular diseases. Give synthesis of any two cardiac drugs.

(ii) Name the different drugs acting on Renal system with their mode of action.

(iii) Write a note on Diurectics.

4 Answer any two of the following : 14

(i) What is hypertension ? What should be normal blood pressure ? Write synthesis of one anti-hypertensive drugs.

(ii) Write a note on anticancer drugs.

(iii) What is diabetics ? Mention its types. Write synthesis of any one oral hypoglycemic agent.

5 Answer any seven of the following questions : 14

(i) Write full form of AIDS and HIV.

(ii) Give the structure and uses of emetine.

(iii) Give name and uses of two drugs of butyrophenone class.

(iv) What are Tranquilizers ?

(v) Define chemotherapeutic drugs.

(vi) Give classification of Anti-arrythimic agent.

(vii) What is sleep cycle ?

(viii) Give side effect and uses of Busulphan.

(ix) To identify the neurotransmitters of CNS.

(x) Give classification of Antiamoebic drugs.

1 Answer any two :

(i) Discuss the effect of pH and dissolved oxygen on the corrosion of iron and steel.

(ii) Discuss the factors affecting the corrosion of iron and steel.

(iii) Write a short note on varieties of steel.

2 Answer any two :

(i) Discuss the application of passivators.

(ii) Write note on Vapor Phase inhibitors.

(iii) Write a short note on slushing compounds.

3 Answer any two :

(i) Explain the principle of cathodic protection theory for corrosion on metals.

(ii) Write a note on sacrificial anode.

(iii) Discuss the anodic protection theory for corrosion on metals.

4 Answer any two :

(i) Discuss the features of Hastalloy and Imcelel.

(ii) Discuss the classification of coating for corrosion resistance.

(iii) Explain the alloying on 'Monel Metal'.

5 Answer any two :

(i) Write a short note on 'Heat treatment'.

(ii) What are packing inhibitors ? Discuss the application of organic inhibitors.

(iii) Discuss the organic coating process for corrosion protection.

Instructions : (1) Attempt all questions
(2) All questions carry equal marks.

1 (a) Do any one of the following **1×4=4**

(i) Calculate reactivity ratios for the copolymerisation reaction between following pair of monomers:

Monomer	Q	e
1,3 Butadiene	2.39	-1.05
Methyl Methacrylate	0.79	0.40

(ii) What type of copolymerization behaviour is expected in a copolymer so formed, when $r_1<1$ and $r_2<1$. (r_1 and r_2 are reactivity ratios). Also explain what azeotropic composition is?

(b) Write a note on any two of the following **2×5=10**

(i) Morphology of Crystalline polymers
(ii) Kinetics of Free Radical copolymerisation
(iii) Mechanism of Step polymerisation considering examples
(iv) Degree of crystallinity and methods for determining degree of crystallinity.

2 (a) Write a note on one of the following **1×4=4**

(i) Purification of monomers before synthesis
(ii) Interfacial Polymerisation

(b) Attempt any two of the following **2×5=10**

(i) Explain various Weight distribution methods used in polymer fractionalisation.
(ii) Determine average molecular weight in polymers using vapour phase osmometery.

(ii) Determine sedimentation coefficient of a polymer in aqueous solution at a concentration 'c' that led to following data where 'r' is the distance of boundary from the axis of rotation and time 't' is the time of centrifugation:

Time (min)	5	10	15	20	25	30	35	40
$R(cm)$	6.560	6.575	6.591	6.609	6.622	6.640	6.654	6.670

(iv) Calculate Mv for polymethyl-methacrylate from the following data.

(where $t_0 = 216.00$, $K = 8.5 \times 10^{-5}$ and $a = 0.75$)

Conc in g/Kg	0.2715	0.1940	0.1509	0.1235	0.1405
Flow time in Sec	460	378	338	312	296

3 (a) Write a note on one of the following **1×4=4**

(i) Maxwell's model

(ii) Compounding and Casting

(b) Attempt any two of the followings **2×5=10**

(i) Discuss deformation behaviour and classify polymeric materials using Burger model and Brownian movement concept.

(ii) Explain various moulding techniques used in polymers.

(iii) Define Rheology and discuss its importance in polymer studies.

(iv) Explain various spinning techniques used in polymer processing.

4 (a) Answer any one of the followings 1×4=4

(i) Tensile strength testing in polymers.

(ii) Role of microscopy in polymer characterisation.

(b) Do any two of the followings. 2×5=10

(i) Explain various thermal methods used for characterisation of polymers.

(ii) Write down various methods used in testing of elasticity in polymers and discuss any two in detail.

(iii) Discuss X-ray diffraction analysis as a tool for polymer characterisation.

(iv) Explain the role of spectroscopy in characterisation of polymers.

5 Attempt seven from the following 2×7=14

(i) Newtonian equation

(ii) Poly functional polymerisation

(iii) Ideal copolymerisation

(iv) Relaxation

(v) Colligative Property

(vi) Reinforcing

(vii) Role of Polarimetery in polymer characterisation

(ix) Principle of viscometery

(x) Mechanical Testing

(4) CHN-703(I) : Coordination Chemistry

Instruction : All questions carry equal marks.

1 (a) Answer any two of the following questions. **10**

(i) Explain the applications of molar conductivity method for coordination compounds.

(ii) Discuss the importance of x-ray crystallography method to study the coordination compounds.

(iii) Write a short note on "Cyclic Voltametry method."

(b) Answer any one of the following questions. **4**

(i) List the precautions to be taken during measurement of molar conductivity of coordination compounds.

(ii) Define the terms : Specific conductivity and equivalent conductivity.

2 (a) Answer any two of the following questions : **10**

(i) Write a short note on "Magnetic succeptibility."

(ii) Explain ferromagnetism and antiferromagnetism.

(iii) Discuss the magnetic succeptibility of binuclear complexes.

(b) Answer any one of the following questions : **4**

(i) Explain direct metal – metal interactions.

(ii) Discuss paramagnetism.

3 (a) Answer any two of the following questions. **10**

(i) Derive the relation between overall and stepwise formation constant.

(ii) Explain the 'Solvent extraction method for determining stability constant.

(iii) Discuss the 'Ion exchange method' for determining the stability constant.

(b) Answer any one of the following questions : 4

(i) Explain the 'spectrophotometric method for determining stability constant.

(ii) Discuss the 'effect of nature of coordinating group' on the stability of complexion.

4 (a) Answer any two of the following questions : 10.

(i) Discuss the applications of coordination compounds in electroplating.

(ii) Discuss the applications of coordination compounds in 'photographic processes'.

(iii) Explain the applications of coordination compounds in 'Dyes'.

(b) Answer any one of the following questions : 4

(i) Explain the applications of coordination compounds as catalyst.

(ii) Discuss the uses of coordination compounds in 'Solvent extraction'.

5 Answer any seven of the following : 14

(i) Define : Molar conductivity

(ii) Give the principle of cyclic voltametric method.

(iii) Give the definition of magnetic succeptibility.

(iv) Draw the structure of any one of Binuclear complex compound.

(v) Give the use of X-ray crystallography in coordination compounds.

(vi) What is thermodynamic stability of complex compounds ?

(vii) What is instability constant ?

(viii) Derive degree of complex formation.

(ix) Write the factors affecting the stability of complex ions.

(x) Write Bregg's equation.