Enrollment No……

Master of Science (Chemistry)
Second Semester Main Examination, June-2021
Inorganic Chemistry - II [MSC201T]

Time: 3:00 Hrs **Max Marks 85**

Note: Attempt all questions. Each question has two parts. Part A is 10 marks and part B is 7 marks.

Q.1 (a) Explain magnetic properties of transition metal complexes. Describe any one method of determination of magnetic susceptibility.
(b) Write a short note on Magnetic exchange coupling.

OR

(a) Write a detailed note on Tanabe syganu diagram for transition metal complexes.
(b) Write a short note on Spin crossover.

Q.2 (a) Explain selection rule for electronic transitions.
(b) What are metallic nitwsyls? Discuss nature of bonding in then

OR

(a) Describe carbonates in details.
(b) Which complex shows Orbital contribution to the magnetic moment? explain.

Q.3 (a) What are π acceptors ligands? Discuss the nature of bonding in metallic carbonyls.
(b) Write a short note on metal metal multiple bonds.

OR

(a) What is bonding structure and important ractions of transition metal nitrosyles? Explain .
(b) Explain Invitrogen and Oxygen complexes.

Q.4 (a) What are electron deficient compounds? Describe the structure bonding in any two higher bornes.
(b) Describe metallobornes and metallic corbozanes.

OR

(a) What types of ligand is triphenyosphine? Give details.
(b) What is linear and circular polarization? explain .

Q.5 (a) State difference between ORD and CD.
(b) Write a short note on Elasticity and circular dichroic.

OR

(a) Give desenptioy of faraday and Kerr effect .
(b) What are different types of cotton effect

Enrollment no .....

Master of Science (Chemistry)
Second Semester Main Examination, June-2021
Organic Chemistry - II [MSC202T]

Time: 3:00 Hrs **Max Marks 85**

Note: Attempt all questions are compulsory. All questions carry equal marks.

Q.1 (a) Explain orientation and reactivity in details.
(b) What is an energy protive diagram? Elaborate.

OR

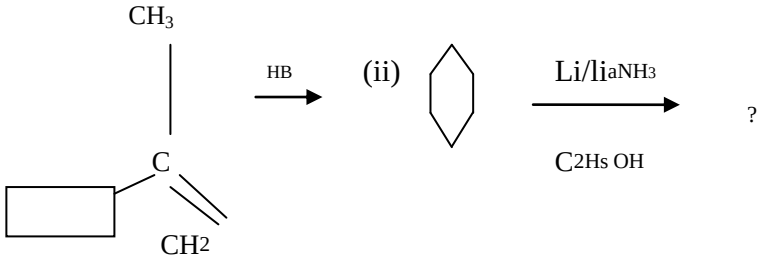
(c) Describe Benzyne and SNI mechanism.
(d) What are Vilsmeir and gateman Koch reaction .

Q.2 (a) Give mechanism of sommelier housec and smiles managements.
(b) Write the products of brominating of I- butane with NBS and indicate the major product.

OR

(c) Explain types of free radical raction and rigo and chemoselectity.
(d) Describe autoxidation and its mechanism.

Q.3 (a) Propose a mechanism of the following reactions.
(i)



(b) Describe sharp plass asymmetric apaxidation.

OR

(a) Explain Hydrogenation of double and triple bounds.
(b) What is mechanistic and stereo chemical aspects? Explain.

Q.4 (a) Addition of IIX on alkenes is regioseletive why?
(b) Describe the ammonolysis of esters.

OR

(c) Explain Perkin and stobbe reactions.
(d) What are Organometallic compounds? Discuss the reactivity of Grignard regent.

Q.5 (a) Classify pericyclic reactions in details.
(b) What do you mean by electro cyclic reactions, conrotatory and disrotary motions.

OR

(a) Explain cycle additions – antaoafacial and superficial additions.
(b) Write short note on Sigma tropic rearrangements.

Enrollment No……

Master of Science (Chemistry)
Second Semester Main Examination, June-2021
Physical Chemistry II [MSC203T]

Time: 3:00 Hrs **Max Marks 85**

Note: Attempt all questions. Question 1 to Question 4 has two parts. Part A is 10 marks and part B is 7 marks.

Q.1 (a) Discuss the methods of determining rate laws.
(b) Describe the collision theory of ractioy rates.

OR

(a) Discuss the kinetics of enzyme reactions.
(b) What are dynamics of unimole color reactions? Explain.

Q.2 (a) What is adsorption? Discuss surface tension in details.
(b) Define micelles and surface active agent & its classification.

OR

(a) Explain estimation of surface area and surface films on liquids.
(b) Write a short note on Critical Micelle Concentration (CMC).

Q.3 (a) What is Macromolecules? Discuss chain configuration of Macromolecules
(b) What are polymers? Discuss the kinetics of polymerization.

OR

(a) Explain types of polymers & mechanism of polymerization.
(b) Write a short note a light scattering method of molecular mass determination.

Q.4 (a) Describe thermodynamic criteria of non equilibrium states.
(b) Explain microscopic reversibility and Onsager's reciprocity Relation.

OR

(a) Discuss transformation of the generalized fluxes and forces.
(b) Write a short note on Phenomenological equation.

Q.5 (a) Discuss structure of electrified surfaces.
(b) Explain theory of double layer at semiconductor.

OR

(a) What is electrochemistry? Explain deviation of electro capillarity.
(b) Write a short note on Lippmann equations.

Enrollment No……

Master of Science (Chemistry)
Second Semester Main Examination, June-2021
Group Theory & Spectroscopy-II [MSC204T]

Time: 3:00 Hrs **Max Marks 85**

Note: Attempt all questions. All questions carry equal marks.

Q.1 (a) What happens when a spinning nucleus is placed in a magnetic field? Explain in Details?

(b) Explain in details the term 'Chemical shift' and its measurements.

OR

(e) What do you mean by Chemically equitation +protons? Explain with example?

(f) Write the structure formulae for the compounds with the following formulae that show only one signal in their PMR Spectra

(i) $C_5 H_{12}$

(ii) C_3H_6

(iii) C_2H_6O

Q.2 (a) Explain electric field gradient and coupling constant.

(b) Write a note on Quadruple moment.

OR

(e) Discuss the theory of NQR

(f) What are the applications of NQR?

Q.3 (a) Explain the difference between ESR & NMR?

(b) Explain Mosley's law?

OR

(a) Discuss different components of ESR spectrometer and its experimental techniques.

(b) Write in details the types of Hyperfine interactions?

Q.4 (a) Deduce Bragg's equitation and find the distance between successive lattice planes in crystal.

(b) Calculate the distance d in rock salt if its density is 2.18 g/cc and molecular weight 58.5?

OR

(a) Explain in detail the factor causing Neutron diffraction and its measuring & techniques.

(b) Explain in detail scattering techniques & scattering anyes. Explain the elucidation of structure of simple gas phase molecular by electron diffraction studies?

Q.5 (a) What is weir equation.

(b) Explain Low energy Electron diffraction (LEED)?

OR

(a) What is X-Ray diffraction and Bragg's law.

(b) The interaction of an Unpaired electron with N^{14} causes a Splitting of there lines while with Mn^{55} in gives six lines why?

Enrollment No……

Master of Science (Chemistry)
Second Semester Main Examination, June-2021
Computer for Chemists [MSC205T]

Time: 3:00 Hrs **Max Marks 85**

Note: Attempt all questions. All question carry equal marks.

Q.1 (a) Write the introduction to Computer's and computing.
(b) How does a computer work explain with an example.

Q.2 (a) What is difference Unix & windows.
(b) What are examples of Secondary storage devices.

OR

(g) What is Programming algorithm & flowchart.
(h) What is a logical variable in Statistics.

Q.3 (a) What is Programming language in Simple words.
(b) How do you Solve a Vander word equation.

OR

(a) What is relation between Molarity & Molality.
(b) What is the structure has the longest bond length.

Q.4 (a) What are the four basic operation of Computer.
(b) What Microsoft word means & MS word features.

OR

(e) What are the main features of MS Excel.
(f) How many method if integration are there.

Q.5 (a) What are the application of Physical chemistry.
(b) What is an Xy plot xy scatter.

OR

(a) What is the application of internet of chemistry.
(b) What is Webcam & their Work.