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HCH-1378-79-80 Seat No._____

M. Sc. (Sem. - IV) Examination

April / May – 2015

Chemistry : Paper - II

(1) CHN-702(O) : Organic Chemistry
(2) CHN-702(I) : Inorganic Chemistry
(3) CHN-702(P) : Physical Chemistry

Time : 3 Hours] [Total Marks : 70

(1) CHN-702(O) : Organic Chemistry

Instructions : (1) All questions carry equal marks.

(2) Answers of all questions must be written in same answer book.

1 Answer **any two :** 14

(1) Discuss important chemicals obtained by industrial methods from C_2 and C_4 fraction and their uses.

(2) Explain the distillation of crude oil and coal tar.

(3) Classify the Natural and artificial fibers. Discuss the properties of synthetic fibers and method of spinning.

2 (a) Answer **any one** : 4

(1) Classify the paints. Explain the methods and applications of applying paints.

(2) Write short note on varnishes raw materials.

(b) Answer **any two** : 10

(1) Dutch and Carter process for manufacturing of white Lead.

(2) What are explosives? Give their characteristics and classification.

(3) Give an account of toxic chemicals used in war.

3 (a) Answer **any one** : 4

(1) Discuss the moulding composition from which the plastics are made.

(2) Give the synthesis and applications of the following.

(i) Phenol Formaldehyde resin.

(ii) Epoxy resin

(iii) Malemine formaldehyde resin

(b) Answer **any two** : 10

(1) Explain the types of polymerization Discuss types of polyester resins.

(2) Discuss the manufacturing of the following

(i) PERLON-L

(ii) Urea formaldehyde resins.

(iii) Cellulose nitrate.

(3) Detail account on cyclization reaction.

4 (a) Answer any one. 4

(1) Give the manufacturing process of chalk crayons.

(2) Give the manufacturing process of Plaster of Paris.

(b) Answer any two. 10

(1) Give the manufacturing process of shoe polish.

(2) Give the steps and tips for stain removal.

(3) What are detergents? Give a short account of sulphonative detergents.

5 Answer **any seven** : 14

(1) What is condensation polymerization? Give suitable example.

(2) Give synthesis of. Nylon 6,6

(3) Define the term addition and substitution polymerization.

(4) Give synthesis of Dacron.

(5) Which metal ions are contained with blue pigments?

(6) Which solvents and thinners are used in varnishes?

(7) Give name of anionic surfactants in detergents.

(8) What is HDPE and LDPE?

(9) Give Classification of Paints.

(10) Give uses of Gum paste.

(2) CHN-702(I) : Inorganic Chemistry

Instruction : All questions carry equal marks.

1 Answer any two :

(i) Write note on polymeric compounds of sulphur.

(ii) Give the various methods for the preparation of borazine and its properties.

(iii) Write a note on : Silicons.

2 Answer any two :

(i) What is coordination polymer ? Give various methods for its synthesis.

(ii) Discuss various uses of inorganic polymer and chelate polymers.

(iii) Discuss the factors affecting the properties of coordination polymers.

3 Answer any two :

(i) Discuss the stereochemistry of compounds of co-ordination number-2.

(ii) Discuss the stereochemistry of compounds of co-ordination numbers 8 and 9.

(ii) Describe the uses of chelating agents as sequestering agent in industries.

4 Answer any two :

(i) What is electron deficient molecule ? Describe hydrogen-bonded structure of B_2H_6.

(ii) Describe boron balancing equation B_5H_{11} and $B_{10}H_{14}$.

(iii) Explain the topological theory of boronhydride.

5 Answer any seven :

(1) Define glass transition temperature T_g*.

(2) What is unusual coordination no. Which C.N. are concluded as unusual C.N. ?

(3) What is silicon resin ?

(4) BF_3 exists but BH_3 does not exist. Assign reason.

(5) What are Kurrolls salts ?

(6) Give structure of B_5H_9.

(7) Give uses of diborane.

(8) What are polyphosphonic nitrilic chloride ? Give equation for its preparation.

(9) What is chelate polymer ?

(10) Benzene and inorganic benzene has isoelectronic relation. Prove it.

1 Answer any two of the following : 14

(i) Discuss about Bell-Evans-Polanyi principle.

(ii) Derive Arhenius equation.

(iii) Write short note on σ_1 and σ_R scales.

2 Answer any two of the following : 14

(i) Explain : Heat of Hydration of proton.

(ii) Give the definition of Ionic liquids.

(iii) Calculate the Ionic mobilities of Anion and cation in potassium - Hydroxide solution.
Equivalent conductance of K^+ = 73.67 $\times 10^{-4}$ mho m^2 mol^{-1}
Equivalent conductance of $\overline{OH}$ = 197.7$\times 10^{-4}$ mho m^2 mol^{-1}.

3 Answer any two of the following : 14

(i) Explain : Solvent effects from the curve-crossing model.

(ii) What is the application of solvation scales in mechanistic studies.

(iii) Discuss any two parameters of scales based on spectroscopic properties.

4 Answer any two of the following : 14

(i) Discuss about "Amperometric titrations".

(ii) Derive the equation of polarographic wave and half wave potential.

(iii) Give the fundamental knowledge about Nephelometery and instrumentation of it.

5 Give the answer : (any seven) 14

(i) What is 'Reaction rates' ?

(ii) Give the principle of reactivity.

(iii) Define the LFER.

(iv) What you mean by Droping mercury electrode ?

(v) What is σ values ?

(vi) Give the definition of electro-catalysis.

(vii) What is "metallurgy" ?

(viii) Give the principle of capillary electrophoresis.

(ix) Give the application of 'Nephelometry'.

(x) Write arhenius equation and define the terms of it.
