Model Paper

Roll No. …….

GOVERNMENT COLLEGE UNIVERSITY, FAISALABAD

QUESTION PAPER FOR EXTERNAL EXAMINATIONS

B Sc. (Composite) Annual -2012 Subject: Chemistry

Course Title: Physical Chemistry Paper: - A

Time Allowed: 03:00 Hours Maximum Marks: 50 Pass Marks: 33%

Note: *Attempt any five questions. All questions carry equal marks.*

Q-1 a) Derive the relation between viscosities and mean free path.

b) Give the significant of Van-der-Waal's constant 'a 'and 'b' and derive their units.

c) Discuss the roots of Van-der-Waal's equation and its change with critical phenomenon.

Q-2 a) How would you say that Parachor, Reheochor and molar refraction is a additive and constitutive Properties.

b) Discuss one of the methods to determine the Dipole moment of a molecule.

c) Define i- Polarization ii- Magnetic Susceptibility.

Q-3 a) Describe powder method for crystal structure determination.

b) State the thermodynamics representation of heat capacities and the graph showing the effect of Temperature.

c) Define i. Diffraction in crystals ii. Symmetry in Crystals

Q-4 a) Which parts of equation in the Polar Co-Ordinates Schrodinger equation is used to derive Principle Quantum number and give method to derive it?

b) What is Eigen Function and why is it used in quantum chemistry calculations?

c) Discuss Normalization of wave function.

Q-5 a) Explain the mathematical treatment of Clausius-Clapeyron equation and discuss its uses.

b) Explain Gibb's Duham equation.

c) Explain isothermal Expansion of an ideal gas.

Q-6 a) Discuss the effect of temperature on equilibrium constant mathematically.

b) Discuss the effect of pressure on equilibrium constant for any suitable equation.

c) The heat of reaction of N2+3H2 ¬ 2NH3 at 298 K is -92200 j moles^{-} calculate delta H at 348 K where heat capacities over the range of temperature are Cp of H2=28.5 (2) C_p of N2 = 28.7 and Cp of NH3 = 35.5 JK^{-} moles^{-}.

Q-7 a) Explain the methods in detail to determine the Order of Reaction.

b) Explain Rate Law to determine the rate of reaction with examples.

c) Explain Transition State Theory.

Q-8 a) What is Emulsification and explain the factors for the stability of Emulsion.

b) Discuss the importance of Colloids.

c) What is the lowering of vapour Pressures? Discuss the effects.

Q-9 a) What is Nernset equation and how is it apply to determine the e.m.f of the cell.

b) Discuss the equation which gives relationship between Electrical energy and Chemical energy.

c) Explain specific Conductivity and Molar Conductivity and how is the Cell constant determined.

Q-10 Write detailed notes on any two of the following:

a) Lanmuir adsorption isotherm

b) Energy of Activation and its determination experimentally.

c) Lindmann's mechanism for determining the rate of Uni molecular reaction.

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QUESTION PAPER FOR EXTERNAL EXAMINATIONS

B Sc. (Composite) Annual -2012 Subject: Chemistry

Course Title: Inorganic Chemistry Paper:- B

Time Allowed: 03:00 Hours Maximum Marks: 50 Pass Marks: 33%

Note: *Attempt any five questions. All questions carry equal marks. (periodic table is not load)?*

Q-1 a) What do you understand by Polarizability and Polarizing power of the ions.

b) Discuss various factors affecting polarizability of anion.

Q-2 a) Discuss the splitting of d-orbitals of tetrahedral complexes on basis of CFT.

b) Describe the merits of crystal field theory.

Q-3 Describe the following terms.

a) Chromophores b) Bathochromic shift

c) Auxochrome d) Hypo chromic, effects

e) Hypsochromic shift

Q-4 a) What is Column Chromatography? Explain it with suitable examples.

b) Give the applications of chromatography.

Q-5 What are modern theories of Acids and Bases, Discuss with examples?

Q-6 Elaborate the steps involved in the manufacturing of Soda Ash, by Solvay process.

Q-7 a) How SHAB principles explain the stability for the complexes and Reaction Rate?

b) What do you know about uses of radioactive isotopes?

Q-8 a) How is manufacturing on industrial scale?

b) Describe activity and activity co-efficient.

Q-9 Write on the following.

a) UV/Vis spectroscopy b) Theory of Indicators.

Q-10 a) What are the ores of Chromium? How ‘Cr’ is extracted from Chromite ore?

b) write at least Four uses of Chromium.

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QUESTION PAPER FOR EXTERNAL EXAMINATIONS

B Sc. (Composite) Annual -2012 Subject: Chemistry

Course Title: Organic Chemistry Paper: - C

Time Allowed: 03:00 Hours Maximum Marks: 50 Pass Marks: 33%

Note: *Attempt any five questions. All questions carry equal marks.*

Q-1 a) What do you know by hybridization of atomic orbital of carbon atoms in alkanes, alkenes, alkynes and arenas? Explain with examples.

b) Give brief description of hybridization of orbital's of nitrogen, oxygen and sulfur atoms in various functional groups.

Q-2 a) Outline three different methods with equation for the synthesis of alkenes.

b) Determine the number of double bonds in the molecule of acyclic alkenes, $C_{10}H_{16}$, 0.40 gm of which reacted with 14.7 ml of 0.2 molar solution of bromine in CCl_4?

c) How toluene can be converted into three isomeric nitro benzoic acids? Show only reaction equations

d) Design a suitable scheme for the synthesis of naphthalene from benzene. Show all the steps.

Q-3 a) Draw the conformational energy diagram of n-butane for a complete of rotation of 360° about Central C-C bond and indicate the relative energies of the potential confirmations.

b) Describes optical isomerism in cyclohexanes.

c) Give various methods for determining the configuration of geometrical isomer?

Q-4 Discuss the facts of various factors on the mechanism and rate of nucleophilic substitution reactions.

Q-5 a) Primary, secondary and tertiary alcohols can be differentiated using different chemical tests. Describe these tests and explain with chemical equations.

b) How can 3, 3 dimethyl -1-butene be converted into the following?

1) 2, 3 Dimethyl -2-butanol,

2) 3, 3 Dimethyl -2-butanol,

3) 3, 3 Dimethyl -1-butanol,

Q-6 a) Outline the synthesis of acetophenone from benzonitrile and from phenyl acetylene.

b) Outline the reaction of benzaldehyde with:

1) Conc.NaOH. 2) NaCN/ aq. EtOH

3) $NaBH_4$ 4) Alkaline Ag_2O

c) Reduction of aldehydes and ketones to hydrocarbon can be carried out either by Clemmensen Reduction or Wolff-kishner reduction. Describe the mechanism of these reductions.

Q-7 a) Outline the synthetic applications of ethyl acetoacetate.

b) Write down the mechanism for acid and base catalysed hydrolysis of an ester.

Q-8 a) How would you synthesize the following compounds starting from pyridine or pyrrole?

i) 3-choloropyridine ii) 2-aminopyridine

iii) 2-nitropyrol Iv) pyridine-N-oxide

Q-9 Write short note on the following:

a) Grignard reagents

b) Pyrolytic elimination

Q-10 Labeled the following structures with systematic IUPAC names. Required diagram to be paste here?