4/10/2017

CHEMISTRY ATKT P-I S.Y.B.Sc. SEM IV MARKS 75M TIME 2.5 HRS

NOTE: i) All the questions are compulsory.

ii) Figures to right indicate full marks.

iii) Use of non –programmable calculator / log table is allowed.

Q1. Attempt any four **[20 marks]**

A. Describe the moving boundary method for the determination of transport number.
B. What are liquid crystals? Explain its classification.
C. Define surface tension and write its important features.
D. How is surface tension measured with the help of stalagmometer? Explain.
E. How is viscosity of liquid experimentally determined?
F. Define viscosity. What are the factors on which viscosity of liquid depend?
G. Water and given liquid takes 100 seconds and 35 seconds respectively to flow between the two marks of an Ostwald's viscosity meter. Calculate the viscosity of liquid, if its density is 0.85 g/cm^3. Given the viscosity of water to be 0.0106 poise and its density to be 0.997 g/cm^3.
H. Write a note on mass defect. Calculate the mass defect of ^{235}U. The mass of U235 is 235.0439 amu. Given: Z= 92, A=235, (A-Z)=143, M_H=1.782, M_n=1.00866.

Q2. Attempt any four **[20 marks]**

A. Discuss calibration curve method used to determine amount of particular component in a sample.
B. Explain the system having upper critical solution temperature.
C. The molar absorptivity coefficient of a solute is 12345 $dm^3mol^{-1}cm^{-1}$. If a solution of the substance has an absorbance of 0.35 in 1cm light path cell. Calculate (a) transmittance (b) concentration of solution.
D. Explain the principle and components of single beam colorimeter with the help of its schematic diagram.
E. Define the terms: (a) transmittance (b) absorbance (c) Beer's law (d) Lambert's law (e) wavelength of maximum absorption.
F. Discuss the solutions having positive deviation from Raoult's law and solutions having negative deviation from Raoult's law with suitable examples.
G. Distinguish between ideal solution and real solution.
H. State Gibb's Phase Rule and explain the meaning of terms involved

CHEMISTRY ATKT P-I S.Y.B.Sc. SEM IV MARKS 75M TIME 2.5 HRS

Q3. Attempt any four **[20 marks]**

A. What do you mean by method error? Explain with suitable examples.
B. Write a note on operational error
C. What are the types of errors? Explain personal error in detail.
D. Write a note on mechanism of adsorption indicators in Fajan's method.
E. For the following observations: 18.32,18.33,18.30,18.31 and 18.33 Calculate (a) Range (b) mean (c) median (d) deviation from mean (e) deviation from median
F. Calculate the molar concentration of Cl^- ions when (a) $20cm^3$ (b) $30cm^3$ (c) $50\ cm^3$ (d) $90\ cm^3$ (e) $95\ cm^3$ of 0.1M $AgNO^3$ is added to $100\ cm^3$ of 0.1M NaCl. Also calculate pCl^- for each {Concentration of Cl^- ions =0.1M}
G. The pH of a solution was determined with the following results: 6.23, 6.28, 6.22, 6.16, 6.34, 6.31, and 6.30. Calculate standard deviation and variance.
H. The following results were obtained in the replicate analysis of ore of metal 'M'. 4.50, 4.53, 4.55, 4.51, 4.57, 4.52. Calculate standard deviation and variance.

Q4. Attempt any three **[15 marks]**

A. Explain photomultiplier tube as detector with suitable diagram.
B. Write a short note on instrumental error.
C. Explain the factors affecting stability of nucleus.
D. Give applications of liquid crystals.
E. (a) Define mean, median and solubitity product. (b) If absolute error is -3 and true value is 186, calculate the relative error.
F. Define photometric titration and explain the various types titration curves.