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X—29—2019

FACULTY OF SCIENCE

B.Sc. (First Year) (First Semester) (Regular) EXAMINATION

OCTOBER/NOVEMBER, 2019

(New Course)

CHEMISTRY

Paper II

(Physical and Inorganic Chemistry)

(Wednesday, 16-10-2019)   **Time : 10.00 a.m. to 12.00 noon**

Time—2 Hours   *Maximum Marks*—40

N.B. :— (i)   Attempt *All* questions.

      (ii)   Calculator and logarithmic table are allowed.

1.   Answer any *three* of the following :   15

   (a)   Give the general characteristics of *s*-block elements.

   (b)   What is Diagonal relationship ? Explain the Diagonal relationship between Li and Mg.

   (c)   Write a note on Wrap around complexes.

   (d)   Give the rules for assigning oxidation number.

   (e)   Discuss the balancing of redox reaction by ion electron method.

2.   Answer any *three* of the following :   15

   (a)   State the postulates of kinetic theory of gases.

   (b)   State and explain 'Permutation and Combination' with example.

   (c)   What is adsorption isotherm ? Explain Langmuir Adsorption isotherm.

   (d)   Define an 'Unit Cell'. Derive Bragg's equation, $n\lambda = 2d \sin \theta$.

   (e)   What is 'Compressibility Factor' ? Calculate Root Mean Square (RMS) velocity of CO_2 molecule at 27°C. ($R = 8.314$ JK^{-1} mol^{-1})

P.T.O.

3. Answer any *two* of the following : 10

   (*a*) Derive an expression for critical constants in terms of Van der-Waal's constants '*a*' and '*b*'.

   (*b*) Explain the factors affecting adsorption.

   (*c*) Discuss the various types of elements of symmetry.

   (*d*) Derive the relationship between pH and pOH.

   Calculate the pH of 0.005 M. Solution of HCl.