X—31—2019

FACULTY OF SCIENCE

B.Sc. (Second Year) (Third Semester) (Regular) EXAMINATION

OCTOBER/NOVEMBER, 2019

CHEMISTRY

Paper-VII

(Physical and Inorganic Chemistry)

(Wednesday, 16-10-2019)   **Time : 2.00 p.m. to 4.00 p.m.**

Time—2 *Hours*   *Maximum Marks*—40

N.B. :— (*i*)   Use separate answer book for paper number-II.

   (*ii*)   Use of calculator and logarithmic table is allowed.

   (*iii*)   Attempt *all* questions.

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

   (*a*)   Explain the effect of neutron to proton (N/P) ratio on nuclear stability.

   (*b*)   What is radioactivity ? Give the characteristics of α-particles.

   (*c*)   Give the applications of radioisotopes in medicine and agriculture field.

   (*d*)   What do you mean by gravimetric analysis ? Discuss different conditions
        for precipitation.

   (*e*)   Explain the following steps involved in gravimetric analysis :

   (*i*)   Digestion

   (*ii*)   Ignition

   (*iii*)   Incineration.

                                                        P.T.O.

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

   (a) What do you understand by dual character of matter ? Derive de-Broglie's equation. How was it verified ?

   (b) State Heisenberg's uncertainty principle. Calculate the uncertainty in the velocity of bullet of mass 10 gms whose position at time 't' is known with uncertainty equal to 1.0×10^{-5} m.

   (c) Explain the terms phase, components and degree of freedom with example.

   (d) Derive an expression for entropy change (ΔS) of an ideal gas as a function of volume and temperature and calculate entropy change when 2 moles of gas is allowed to expand from 5 litres to 50 litres at 303 K. (Given R = 8.314 joules).

   (e) What is Joule-Thomson coefficient ? Derive expression for inversion temperature.

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

   (a) Write a note on Compton effect.

   (b) Describe silver-lead (Ag-Pb) system on the basis of phase rule.

   (c) Describe in brief entropy change (ΔS) in :

   (i) Fusion of solid

   (ii) Vapourisation of liquid.

   (d) Write a note on Carnot cycle.