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Y—58—2019

FACULTY OF SCIENCE

B.Sc. (Second Year) (Fourth Semester) (Backlog) EXAMINATION

OCTOBER/NOVEMBER, 2019

CHEMISTRY

Paper IX

(Physical and Inorganic Chemistry)

(MCQ & Theory)

(Thursday, 17-10-2019)   **Time : 2.00 p.m. to 4.00 p.m.**

Time—2 *Hours*   *Maximum Marks*—40

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

(*ii*)   *All* questions carry equal marks.

(*iii*)   Use only one answer book for both Sections A and B.

(*iv*)   Use separate answer sheet (OMR sheet) for MCQ Q. No. **1**.

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

(*vi*)   Use black ball point pen to darken the circle of correct choice in OMR sheet.

MCQ

1.   Select the *correct* answer for each of the following Multiple Choice Questions :

(*i*)   The plot of $\log(a - x)$ against time (t) is straight line indicates that the reaction is of :

(*a*)   First order   (*b*)   Second order

(*c*)   Third order   (*d*)   Zero order

P.T.O.

(*ii*) Arrhenius equation is :

(*a*) $\quad K = A.e^{\frac{-E_a}{RT}}$ $\qquad\qquad$ (*b*) $\quad K = A.e^{\frac{E_a}{RT}}$

(*c*) $\quad K = A.e^{\frac{E_a}{T}}$ $\qquad\qquad$ (*d*) $\quad K = A.e^{\frac{-E_a}{RT^2}}$

(*iii*) On dilution specific conductance :

(*a*) $\quad$ decreases $\qquad\qquad$ (*b*) $\quad$ increases

(*c*) $\quad$ remains same $\qquad\quad$ (*d*) $\quad$ becomes zero
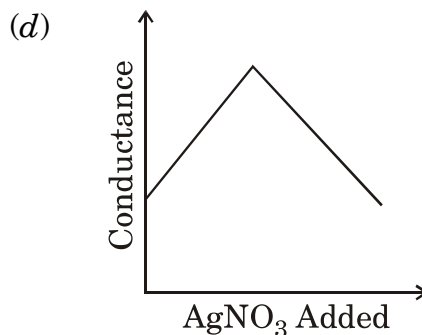
(*iv*) A strong electrolyte :

(*a*) $\quad$ dissociates completely in solution

(*b*) $\quad$ has high degree of dissociation

(*c*) $\quad$ solution has high conductance

(*d*) $\quad$ all of the above

(*v*) When KCl is titrated against $AgNO_3$ solution conductometrically, the correct graphical representation is :

(*a*) Conductance vs AgNO₃ Added

(*b*) Conductance vs AgNO₃ Added

(*c*) Conductance vs AgNO₃ Added

(*d*) Conductance vs AgNO₃ Added
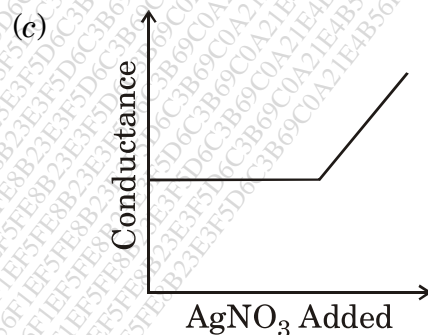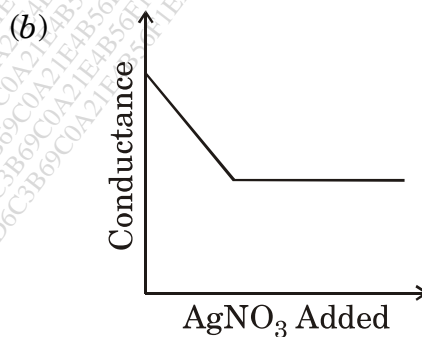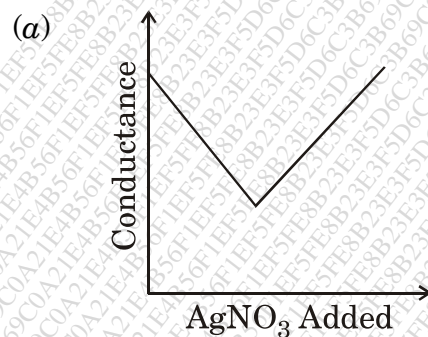
(vi) .... stops as soon as incident light is cut-off.

    (a) Phosphorescence   (b) Chemiluminiscence

    (c) Photosensitization   (d) Fluorescence

(vii) Absorbance A of light by a medium is expressed by :

    (a) $\log_{10}\dfrac{I_t}{I_0}$ (b) $\log_{10}\dfrac{I_0}{I_t}$

    (c) $-\log_{10}\dfrac{I_0}{I_t}$ (d) $-\log_{10}\dfrac{I_t}{I_0}$

(viii) The geometrical structure of $[ICl_2]^-$ is :

    (a) Linear   (b) Tetrahedral

    (c) Trigonal   (d) Square planar

(ix) Formula of freon is :

    (a) $CClF_3$ (b) CCl_3F

    (c) CCl_2F_2 (d) CF_4

(x) Mica is :

    (a) Sheet Silicate   (b) Pyrosilicate

    (c) Chain Silicate   (d) Cyclic Silicate

Theory

Section A : Physical Chemistry

2. Solve any *two* of the following :

(a) Define the terms rate of reaction and rate constant. Discuss any *three* factors affecting rate of reaction.

(b) Give in detail Arrhenius theory of electrolytic dissociation.

(c) What is quantum yield ? What are reasons of low and high quantum yield ?

P.T.O.

(d) In saponification of ethyl acetate the following data is obtained :

Time (in minute)	0	15	25	35
(a – x)	10	4.9	3.6	2.9

Show that the reaction is of second order if initial concentration of both reactants are equal.

3. Solve any *two* of the following :

(a) What is order of reaction ? Explain fractional change method for determination of order of reaction.

(b) What is Kohlrausch's law ? Explain its use in the determination of degree of dissociation of weak electrolyte.

(c) State and explain Stark-Einstein's law of photochemical equivalence.

(d) (i) 0.5 N solution of salt surrounding two platinum electrodes 2.5 cm apart and 4.5 cm^2 in area was found to offer a resistance of 30 ohm. Calculate the specific conductance of the solution.

(ii) Write a note on Asymmetry effect.

Section B : Inorganic Chemistry

4. Answer any *two* of the following :

(a) Describe any *two* methods of preparation for XY_3 interhalogen compound and explain its structure.

(b) What are Fluorocarbons ? Give its classification.

(c) What are Carbides ? Give its classification.

(d) Write notes on :

(i) Pyrosilicates

(ii) Hybridisation and structure of $[ICl_4]^-$.