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W—52—2018

FACULTY OF SCIENCE

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

OCTOBER/NOVEMBER, 2018

(CBCS/CGPA Pattern)

CHEMISTRY

Paper II

(Physical and Inorganic Chemistry)

(MCQ+Theory)

(Monday, 15-10-2018)

Time : 10.00 a.m. to 12.00 noon

Time—2 Hours

Maximum Marks—40

N.B. :— (i) Attempt all questions.

(ii) All questions carry equal marks.

(iii) Use OMR sheet for question No. 1.

(iv) Calculator and logarithmic table is allowed.

(MCQ)

1. Select the correct answer for each of the following multiple choice questions :

(i) The characteristic of $\log_{10} (0.00078)$ is :

(A) 4 (B) $\bar{4}$

(C) $\bar{3}$ (D) 3

(ii) The intercept form of the line is given by equation :

(A) $\frac{x}{a} + \frac{y}{b} = 1$ (B) $y = mx + c$

(C) $2x + 3y = 1$ (D) $x + 2y = 2$

(iii) Chemisorption generally with temperature.

(A) increases (B) decreases

(C) remains the same (D) None of these

P.T.O.

- (iv) Excluded volume is times the actual volume of gas molecules.
- (A) $\frac{1}{2}$ (B) two
(C) three (D) Four
- (v) Which of the following is *correct* relation ?
- (A) $Vc = 3b$ (B) $Pc = \frac{a}{27b^2}$
(C) $Tc = \frac{8a}{27Rb}$ (D) All of these
- (vi) The number of atoms in a unit cell of face centred cubic lattice is :
- (A) 2 (B) 4
(C) 6 (D) 8
- (vii) Sodium chloride (NaCl) is an example of :
- (A) Crystalline Solid (B) Ionic Solid
(C) Both (a) & (b) (D) Metallic Solid
- (viii) Which of the following elements does *not* form peroxide ?
- (A) Be (B) Mg
(C) Ca (D) Sr
- (ix) Sodium imparts colour to the flame.
- (A) Crimson red (B) Golden yellow
(C) Violet (D) Green yellow
- (x) Oxidation number of 'Mn' in KMnO_4 is :
- (A) +4 (B) +5
(C) +6 (D) +7

(Theory)

Section A

(Physical Chemistry)

2. Answer any *two* of the following :

- (a) State and explain permutation. Evaluate the value of ${}^{10}P_2$.

- (b) Discuss the factors affecting adsorption.
- (c) Define 'Compressibility factor' and 'Critical temperature'.
Calculate the RMS Velocity of CO_2 molecule at 227°C ($R = 8.314 \text{ JK}^{-1} \text{ mol}^{-1}$)
- (d) Explain the law of rational indices and write a note on 'Miller Indices'.
3. Answer any *two* of the following :
- (a) State the postulates of Kinetic theory of gases.
- (b) Explain the crystal structure of Potassium chloride (KCl) by Bragg's X-ray diffraction method.
- (c) Define Freundlich adsorption isotherm. Describe Claude's method of liquefaction of gases.
- (d) What is SI unit of 'Force' and 'Density' ? Calculate $[\text{H}^+]$ of a solution having $\text{pH} = 5.8$.

Section B

(Inorganic Chemistry)

4. Answer any *two* of the following :
- (a) Discuss the diagonal relationship between Li and Mg.
- (b) Explain in brief hydrides of s-block elements.
- (c) (i) Give the formation of complex of sodium with Salicylaldehyde.
(ii) Define oxidation and reduction according to classical concept.
- (d) Give the rules for assigning oxidation number.