

This question paper contains 3 printed pages]

Y—59—2019

FACULTY OF SCIENCE

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

OCTOBER/NOVEMBER, 2019

CHEMISTRY

Paper II

(Physical and Inorganic Chemistry)

(MCQ & Theory)

(Friday, 18-10-2019)

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 are allowed.

(v) Only one answer sheet should be used for sections A & B.

MCQ

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

(i) The slope of line passing through two points (4, -5) and (6, 7) is :

(a) 4

(b) 5

(c) 6

(d) 7

(ii) The S.I. unit of 'Pressure' is :

(a) Pa

(b) Nm^{-2}

(c) $\text{Kgm}^{-1}\text{s}^{-2}$

(d) All of these

(iii) Longmuir isotherm holds at low pressures but fails at.....

(a) high pressures

(b) low temperature

(c) both (a) & (b)

(d) None of these

(iv) Van der-Waal's equation explains the behaviour of.....

(a) Ideal gases

(b) Real gases

(c) Non-real gases

(d) None of these

P.T.O.

(v) RMS velocity is given by the term :

- (a) $\sqrt{\frac{3RT}{M}}$ (b) $\sqrt{\frac{3PV}{M}}$
 (c) $\sqrt{\frac{3P}{D}}$ (d) All of these

(vi) Which of the following is an amorphous solid ?

- (a) Graphite (b) Diamond
 (c) Rubber (d) Table salt

(vii) For simple cubic lattice, the relative spacings for the unit cell are :

- (a) $\frac{a}{2} : \frac{a}{\sqrt{2}} : \frac{a}{2\sqrt{3}}$ (b) $\frac{a}{2} : \frac{a}{2\sqrt{2}} : \frac{a}{\sqrt{3}}$
 (c) $a : \frac{a}{2\sqrt{2}} : \frac{a}{2}$ (d) $a : \frac{a}{\sqrt{2}} : \frac{a}{\sqrt{3}}$

(viii) The alkaline earth metal which does not form its hydride directly with H_2 .

- (a) Be (b) Mg
 (c) Ca (d) Sr

(ix) The metal presents in chlorophyll is.....

- (a) Ca (b) Mg
 (c) Mn (d) Zn

(x) $Sn^{+2} \longrightarrow Sn^{+3} + e^-$ is

- (a) Redox reaction (b) Oxidation
 (c) Reduction (d) Neutralization

Theory**(Physical Chemistry)**

2. Answer any *two* of the following :

- Derive kinetic gas equation, $PV = \frac{1}{3}mnu^2$.
- What is 'adsorption isotherm'? Explain freundlich adsorption isotherm.
- Explain the determination of crystal structure of sodium chloride (NaCl) by using Bragg's x-ray diffraction method.
- Prove, $p^H + p^{OH} = 14$. Calculate pH of $2.5 \times 10^{-3}M.HCl$ solution.

3. Answer any *two* of the following :

- What are Ideal and Non-ideal gases ? Explain the deviation of gases from ideal behaviour.
- Discuss the various types of elements of symmetry.
- Give the difference between adsorption and absorption.
 - Calculate the RMS velocity of carbon monoxide (CO) molecule at 373 K ($R = 8.314 JK^{-1} mol^{-1}$)
- State and explain 'permutation'. Evaluate the value of $15p_3$.

(Inorganic Chemistry)

4. Solve any *two* of the following :

- Discuss the flame colours and metallic properties of s-block elements.
- Discuss the formation of complexes of alkali metals with Salicylaldehyde and Acetylacetonone.
- Write a note on oxides of s-block elements.
 - Define oxidation and reduction according to oxidation number concept.
- Give the rules for assigning oxidation number.