UNIVERSITY OF THE PUNJAB

First Semester – 2019

Examination: B.S. 4 Years Program

Roll No. in Fig. .....

Roll No. in Words. .....

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Signature of Supdt.:

PAPER: Fundamentals of Chemistry (Rev.) **MAX. TIME: 15 Min.**

Course Code: CHEM-111-N Part – I (Compulsory) **MAX. MARKS: 10**

Attempt this Paper on this Question Sheet only.

Please encircle the correct option. Division of marks is given in front of each question.

This Paper will be collected back after expiry of time limit mentioned above.

Q.1. Encircle the right answer, cutting and overwriting is not allowed. (1x10=10)

(i) The velocity of beta rays is almost equal to
(a) Velocity of alpha rays (b) velocity of light
(c) Velocity of sound (d) velocity of gmma rays

(ii) The units of zero order rate constant are
(a) $mmol^{-1}$ (b) $mol\ dm^{-3}sec^{-1}$ (c) $m^2\ mol^{-2}$ (d) $mol\ m^{-2}$

(iii) Water is used in nuclear reactor as
(a) Moderator (b) coolant (c) Fuel (d) Both a & b

(iv) The most electronegative of these group I element is
(a) K (c) Cs
(b) Li (d) Rb

(v) The shape of a molecule with five electron pairs around a central atom will be
(a)tetrahedral (b) pyramidal (c) trigonal bipyramidal (d)octahedral

(vi) The Bond angle around the atom which uses sp^2 hybrid orbital is
(a) 120 (b)180 (c) 110 (d) 109.5

(vii) The SI units of pre-exponential factor A in equation $k = Ae^{-\frac{E_a}{RT}}$ for 2nd order reaction are
(a) $M^{-1}S^{-1}$ (b) $M^{-2}S^{-1}$ (c) MS^{-1} (d) None of these

(viii) The units of coefficient of viscosity are
(a) $kg\ m^{-1}\ s^{-1}$ (b) $kg\ m^{-2}\ s^{-1}$ (c) $kg\ m^{-1}\ s^{-2}$ (d) none

(ix) Van der wals equation of state approaches ideality at
(a) high pressure and low temperature (b) low values of PV product
(c) low pressure and high temperature (d) none of these

(x) The value of refractive index of aqueous solution of sucrose
(a) Increases with concentration (b) Decreases with concentration
(c) Does not change with concentration (d) None of these

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First Semester – 2019

Examination: B.S. 4 Years Program

Roll No. .....

PAPER: Fundamentals of Chemistry (Rev.) **MAX. TIME: 2 Hrs. 45 Min.**

Course Code: CHEM-111-N Part – II **MAX. MARKS: 50**

ATTEMPT THIS (SUBJECTIVE) ON THE SEPARATE ANSWER SHEET PROVIDED

Q. 2 Answers the following short questions: (2×10=20)

i. Iodoacetic acid is ten times less acidic than chloroacetic acid.
ii. What is 1st order reaction? Give units of 1st order rate constant.
iii. The C—Cl bond length is shorter in vinyl chloride than in CH_3CH_2Cl.
iv. Define the term refractive index and give its unit.
v. Write down Bragg's equation and give the meaning of various parameters in it.
vi. Write down two causes for deviation of gases from ideal behavior.
vii. Name the factors that govern the ionization energy of an element.
viii. Predict the name of shapes or geometry of following molecules , using VESPER model.(a) CCl_4 (b) H_2Se (c) AsF_3 (d) $AlCl_3$
ix. Why do lighter elements generally undergo fusion while heavier elements show nuclear fission?
x. How do you prove that half life period of a first order reaction is independent of initial concentration of reactant?

Questions with brief answers

Q.3 (a) Define surface tension. Give its SI units. How it can be measured? (5)

(b)How ionization potential and electro negativity vary in the periodic table. (5)

Q.4 (a) What is order of reaction? Derive kinetic equation for 2nd order reaction when initially concentration of both reactants is same. (5)

(b) Compare and contrast the Valence bond and Molecular orbital theories. (5)

Q.5 (a) What is radioactivity? Prove that for a radioactive element $t_{1/2}$ is $0.693/k$ where k is decay constant. (5)

(b)Discuss the diffraction of X-rays. (5)