

SEAT No. _____

[48]



No. of Printed Pages : 4

SARDAR PATEL UNIVERSITY

F.Y.B.Sc. (SEMESTER -II) EXAMINATION

SUBJECT : GENERAL CHEMISTRY - II, US02CCE51

DATE : 25/04/2022

TIME : 12:00P.M. TO 2:00P.M.

DAY : MONDAY

TOTAL MARKS : 70

NOTE : 1. ALL QUESTIONS ARE TO BE ATTEMPTED.

2. FIGURES TO THE RIGHT INDICATE FULL MARKS.

Q.1 ANSWER THE FOLOWING MULTIPLE CHOICE QUESTIONS : [10]

- Which type of bond is present in organic compound ?
(a) Ionic (b) Covalent (c) Co-ordinate (d) Dative
- The atom or a group of atom have tendency to accept a pair of electron is called
(a) Nucleophile (b) Electrophile (c) Benzonium ion (d) Free radical
- In H_2 molecule which type of combinations of atomic orbitals take place ?
(a) $s-p$ (b) $s-s$ (c) $p-p$ (d) $p-d$
- Which pair of ions has planar triangle geometry ?
(a) BF_4^- & NH_4^+ (b) N_3^- & NO_2^- (c) CO_3^{2-} & NO_3^- (d) None of these
- In PCl_5 molecule due to three P-Cl bonds in the same plane , angle between them is
(a) 120° (b) 90° (c) 45° (d) 180°
- The melting point of XeF_2 is
(a) $250^\circ C$ (b) $100^\circ C$ (c) $400^\circ C$ (d) $129^\circ C$
- Nobel gases have tendency to form bonds.
(a) Zero (b) None of these (c) little (d) more
- Which of the following is a Chelate ?
(a) $[CrCl_2(en)_2NO_3]$ (b) $K[MnO_4]$ (c) $K_3[Fe(CN)_6]$ (d) $[Ag(NH_3)_2]OH$
- For a chemical reaction, the concentration of reactants and products on attaining an equilibrium state becomes
(a) Zero (b) Equal (c) constant (d) None of these
- The unit of rate constant of a zero order reaction is
(a) Sec^{-1} (b) $lit\ mole^{-1}$ (c) $lit^2\ Mole^{-2}\ Sec^{-1}$ (d) $Mole\ lit^{-1}\ Sec^{-1}$

Q.2 FILL IN THE BLANKS SELECTING THE APPROPRIATE OPTION GIVEN IN THE BRACKET : [08]

- Nucleophiles are [Lewis acid / Lewis base]
- In alkyl halides the carbon atom attached to halogen has hybridization. [SP^2 / SP^3]
- Bond order of CN molecule is [2.1 / 2.5]
- H_2O molecule shape is [Bent / pyramidal]
- Nobel gases have electron affinity than any other elements. [zero / High]
- Triethylene tetramine Nitrilo triacetate (NTA)³⁻ is ligand. [Bidentate / Tetradentate]
- The rate constant of a reaction is only affected by..... [Temperature / Catalyst]
- Minimum amount of energy required to cause a chemical reaction is called,
[Chemical energy / Activation energy]

Q.3 SHORT QUESTIONS (ATTEMPT ANY TEN) :- [20]

- Give the difference between S_N1 and S_N2 reaction.
- Define : Benzynes
- What is hemolytic and heterolytic reaction ?
- What are Isoelectronic species ? Give suitable example.
- State the general rule for trigonal bipyramid structure.

[P.T.O]

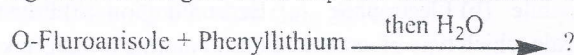
6. State the octate rule.
7. Give electronic configuration of Noble gases .
8. Define : Ambidentate ligand
9. Give the IUPAC name of following complexes : (i) $[\text{Pt}^{\text{II}}(\text{Py})_4][\text{Pt}^{\text{II}}\text{Cl}_4]$ (II) $[\text{Ni}^{\text{IV}}(\text{en})_2\text{Cl}_2]^{-2}$
10. Define the terms : (i) Mechanism of the reaction (ii) Rate constant
11. Write mechanism and rate law of the reaction : $2\text{NO}_2 + \text{F}_2 = 2\text{NO}_2\text{F}$
12. Write the correct Arrhenius equation . Give the meaning of each term involved in it.

Q.4

LONG QUESTIONS (ATTEMPT ANY FOUR) :-

[32]

1. Write all the possible isomeric structural formula and IUPAC name for the compound having molecular formula $\text{C}_5\text{H}_{11}\text{Br}$.
2. Complete the following reaction and give detail stepwise mechanism for it .



3. Using VSEPR theory , Chlorine trifluoride (ClF_3) has distorted trigonal bipyramidal shape , while I_3^- (Triiodide ion) has linear shape.
4. Describe molecular orbital treatment of (i) N_2 molecule (ii) CO^+ molecule
5. Give the preparation , properties and bonding in XeF_4 .
6. What are Chelates ? Give classification and uses of Chelates .
7. What is integrated rate law ? Derive integrated rate law expression for second order reaction. Give its characteristics and unit.
8. The decomposition of N_2O_5 in CCl_4 solution follows the first order rate law. The rate constant of the reaction is $6.2 \times 10^{-4} \text{ min}^{-1}$ at 45°C . Calculate the time for (i) the reaction to decrease the concentration of N_2O_5 from 0.02M to 0.005M and (ii) for 25% completion reaction.

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