

COMMON HALF-YEARLY EXAMINATION - 2019

Reg No.

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Standard XI

CHEMISTRY

Mark

Time: 100 hours

Instructions: i) Check the question paper for fairness of printing. If there is lack of fairness, inform the Hall Supervisor immediately.
ii) Use blue or black ink to write and underline and pencil to draw diagrams.

Note: Draw diagrams with wide margins wherever necessary.

Note: i) Answer all questions.
ii) Choose the correct answer from the four alternative options and write the option code and the corresponding answer.

1. The empirical formula of glucose is
a) CH_2O b) CHO c) CH_2O_2 d) CH_2O_3
2. The effective nuclear charge decreases with increase in _____ quantum number
a) Principal b) Azimuthal c) Magnetic d) Spin
3. What would be the IUPAC name for an element with atomic number 111?
a) ununium b) unununium c) ununbium d) ununtrium
4. Water gas is
a) $\text{H}_2\text{O(g)}$ b) $\text{CO} + \text{H}_2\text{O}$ c) $\text{CO} + \text{H}_2$ d) $\text{CO} + \text{N}_2$
5. Match the flame colours of the alkali and alkaline earth metal salts in the Bunsen burner flame.

p) Sodium	1) Lilac
q) Potassium	2) Yellow
r) Barium	3) Brick red
s) Calcium	4) Apple green

a) (p)-(2) (q)-(3) (r)-(4) (s)-(1)	b) (p)-(3) (q)-(4) (r)-(1) (s)-(2)
c) (p)-(4) (q)-(1) (r)-(2) (s)-(3)	d) (p)-(1) (q)-(2) (r)-(3) (s)-(4)
6. Assertion: Critical temperature of CO_2 is 304 K, it can be liquified above 304 K.
Reason: For a given mass of gas, volume is directly proportional to pressure at constant temperature.
a) Both assertion and reason are true and reason is the correct explanation of assertion.
b) Both assertion and reason are true but reason is not the correct explanation of assertion.
c) Assertion is true but reason is false. d) Both assertion and reason are false.
7. A process in which the pressure of the system remains constant during its change from initial to final state is known as
a) isochoric process b) isothermal process
c) cyclic process d) isobaric process
8. In a chemical equilibrium, the rate constant for the forward reaction is $2.5 \times 10^3 \text{ s}^{-1}$ and the equilibrium constant is 50. The rate constant for the reverse reaction is
a) 11.5 b) 5 c) 2×10^2 d) 2×10^{-3}

Which one of the following is correct for ideal solution?

- a) $\Delta H_{mix} = 0$
- b) $\Delta U_{mix} = 0$
- c) $\Delta P = P_{actual} - P_{ideal} = 0$
- d) $\Delta Q_{mix} = 0$

Shape of BF_3 is

- a) Planar triangular
- b) Tetrahedral
- c) Pyramidal
- d) Circular

The simplest ketone is

- a) $CH_3 - CH_2 - CO - CH_3$
- b) $CH_3 - CO - CH_3$
- c) $CH_3 - O - CH_3$
- d) $CH_3 - COO - CH_3$

Write the decreasing order of +I effect.

- a) $-CH_2CH_3 > -CH_3 > -C(CH_3)_3 > -CH(OH)_2$
- b) $-CH_3 > -CH_2CH_3 > -CH(OH)_2 > -C(CH_3)_3$
- c) $-C(CH_3)_3 > -CH(OH)_2 > -CH_2CH_3 > -CH_3$
- d) $-CH(OH)_2 > -CH_2CH_3 > -C(CH_3)_3 > -CH_3$

 is the bond line formula for

- a) 1-methyl butane
- b) 2-methyl butane
- c) 1-methyl propane
- d) 2-methyl propane

A name of $C_2F_2Cl_2$ is

- a) Freon - 112
- b) Freon - 113
- c) Freon - 114
- d) Freon - 115

Removal of oxides of nitrogen and hydrocarbons into the atmosphere by converted by using

- a) light chamber
- b) scrubbers
- c) tricking filters
- d) catalytic converters

Part - II

Answer any 6 questions: (Ques. No. 24 is compulsory)

1. Write Aufbau principle.

2. How does the ionisation energy vary across a period and down a group?

3. Give the uses of Plaster of Paris.

4. State the First law of Thermodynamics.

5. Give K_p value for dissociation of PCl_5 .

6. What are homologous series?

7. How is toluene prepared from benzene in the presence of anhydrous $AlCl_3$ and write the equation.

8. Why ozone is considered as earth's natural umbrella?

9. Draw the Lewis dot structure for nitric acid.

(7)

Part - III

or any 5 questions: (Ques. No. 33 is compulsory)

Write the differences between Oxidation and Reduction.

List the postulates of Bohr's atomic model.

Write the characteristics of Internal Energy.

State Henry's law.

Define Bond order.

Identify the possible isomerism exhibited by C_2H_4O with examples.

Write the electrophilic substitution reaction of benzene.

Convert chlorobenzene to: i) Phenol ii) Aniline

Calculate the effective nuclear charge of 4s electron in potassium.

Part - IV

or all the questions:

- What is combination reaction? Give an example.
- State Modern Periodic Law.

(or)

- Energy of an electron Hydrogen atom in ground state is -13.6 eV. What is the energy of the electron in the second excited state?
- Write the mathematical expression for Gibbs free energy.

What are hydrides? Write the difference between metallic hydrides with an example.

(or)

- How is washing soda prepared by Solvay process?
- What are the conditions necessary for the spontaneity of a process?
- Derive Ideal gas equation.
- Why is chemical equilibrium considered dynamic in nature?

(or)

- Write K_p and K_c for the following reaction:

$$2H_2O(g) + 2Cl_2(g) \rightleftharpoons 4HCl(g) + O_2(g)$$
- Define the term solubility and what are the factors that influence it?
- Write the characteristic of organic compound.
- Write the IUPAC Name / Molecular formula for the first four members of the homologous series.

(or)

- Give an example for Benzenoid compound and a non benzenoid compound.
- Explain inductive effect with suitable examples.
- Discuss the formation of Nitrogen molecule using Molecular Orbital theory.
- Write the structure and use of gamma-xylene.

(or)

- Name the reaction used to test primary amine? Write the complete equation for the above reaction.
- Write the harmful effects of acid rain.