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**Answer Sheet No.**_____

**Sign. of Candidate** _____

**Sign. of Invigilator** _____

# CHEMISTRY SSC–I (2nd Set)

## SECTION – A (Marks 12)

**Time allowed: 20 Minutes**

Section – A is compulsory. All parts of this section are to be answered on this page and handed over to the Centre Superintendent. Deleting/overwriting is not allowed. **Do not use lead pencil.**

**Q.1 Fill the relevant bubble for each part. Each part carries one mark.**

(1) If the pressure of a gas, initially at 760mmHg, is increased to 1520 mmHg then volume of the gas will change from $2dm^3$ to:

A. $1dm^3$ ◯ B. $2dm^3$ ◯
C. $3dm^3$ ◯ D. $4dm^3$ ◯

(2) The temperature at which vapor pressure of a liquid becomes equal to atmospheric pressure is called boiling point. The boiling point of water on the top of Mount Everest is:

A. 70˚C ◯ B. 100˚C ◯
C. 130˚C ◯ D. 150˚C ◯

(3) Identify from the following solvents which one is polar and can dissolve compounds having hydrogen bonding.

A. benzene ◯ B. ether ◯
C. water ◯ D. petrol ◯

(4) Molarity of a solution of NaOH is 1M. How many numbers of moles of NaOH will be present in $250cm^3$ of this solution?

A. 0.25 ◯ B. 0.5 ◯
C. 0.75 ◯ D. 1.0 ◯

(5) Oxidizing agent is a substance which

A. Reduces itself and oxidizes other substance ◯
B. Reduces itself and also reduces other substance ◯
C. Oxidizes itself and reduces other substance ◯
D. Oxidizes itself and also oxidizes other substance ◯

(6) Electrons are filled in four shells, K, L, M and N. L shell has sub-shells

A. 1s ◯ B. 2s, 2p ◯
C. 3s, 3p, 3d ◯ D. 4s, 4p, 4d, 4f ◯

(7) Isotopes have same atomic number and different mass numbers. Which radioisotope is used for the diagnosis of tumor in the body?

A. Cobalt-60 ◯ B. Iodine-131 ◯
C. Strontium-90 ◯ D. Phosphorus-30 ◯

(8) Covalent bonds are formed by sharing of electron. Identify the covalent compound:

A. $CS_2$ ◯ B. $Na_2S$ ◯
C. $CaCl_2$ ◯ D. LiBr ◯

(9) Predict the group and period that shows electric configuration of X is $3s^2$, $3p^4$.

A. IIIA, $6^{th}$ ◯ B. IVA, $3^{rd}$ ◯
C. VA, $4^{th}$ ◯ D. VIA, $3^{rd}$ ◯

(10) Atoms react with each other. The following statements are correct **EXCEPT**:

A. They want to complete valance shell ◯
B. They are short of electrons ◯
C. They want to attain stability ◯
D. They want to disperse ◯

(11) Non-metals do not lose electrons easily. Predict which statement is correct about non-metals?

A. They are malleable. ◯
B. They are good conductor of heat. ◯
C. They are poor conductor of electricity. ◯
D. They are ductile. ◯

(12) A chemist performed an experiment to check the percent purity of a glucose $C_6H_{12}O_6$ sample. Identify the branch of chemistry:

A. Biochemistry ◯ B. Analytical chemistry ◯
C. Industrial chemistry ◯ D. Organic chemistry ◯

Federal Board SSC-I Examination
Chemistry Model Question Paper
(Curriculum 2006)

Time allowed: 2.40 hours Total Marks: 53

Note: Answer any eleven parts from Section 'B' and attempt any two questions from Section 'C' on the separately provided answer book. Write your answers neatly and legibly.

## SECTION – B (Marks 33)

**Q.2** Attempt any **ELEVEN** parts from the following. All parts carry equal marks. (11 × 3 = 33)

i. Calculate the number of H atoms in 20g of glucose ($C_6H_{12}O_6$).

ii. Describe relative atomic mass? Give an example.

iii. Rutherford's atomic theory explains the atomic structure. What are the limitations of Rutherford's atomic theory?

iv. An element has atomic number 17. Predict the position of it in Periodic Table.

v. Define shielding effect. Among (Li, Na) and (N, P) pairs which one has higher shielding effect?

vi. Noble metals show very low reactivity. Enlist three properties of their inertness.

vii. Atoms are joined together by ionic or covalent bonds. Differentiate between ionic bond and covalent bond.

viii. Differentiate between shell and subshell with an example.

ix. The forces that bind the atoms together in a molecule are called chemical bonds. Show covalent bonding with the help of dot and cross structure of HCN and $CO_2$.

x. Differentiate between amorphous solids and crystalline solids.

xi. Define allotropy and give two examples.

xii. Electroplating is the process in which one metal is coated on another by electrolytic process. Briefly explain electroplating of chromium with reactions.

xiii. Define sublimation. Briefly explain with the help of example.

xiv. Differentiate between electron affinity and electronegativity.

xv. Identify oxidizing and reducing agents from the following equations.

$2NH_3+3CuO \rightarrow 3Cu+N_2+3H_2O$

$WO_3+3H_2 \rightarrow W+3H_2O$

## SECTION – C (Marks 20)

**Note:** Attempt any **TWO** questions. All questions carry equal marks. (2 × 10 = 20)

**Q.3** a. What is vapour pressure of liquid? How does vapour pressure vary with temperature at constant pressure? Show by graph. (3+2)

b. Systematic arrangement of elements in a table is called periodic table. Describe its important features. (5)

**Q.4** a. Properties of compounds depend upon the nature of bond present in it. Illustrate the formation of ions in $_{12}Mg^{24}$ and $_{17}Cl^{35}$ by complete shell diagram. (6)

b. Differentiate between compound and mixture and give one example of each. (4)

**Q.5** a. A student obtained following data in an experiment at 20°C. (4)
Prove Boyle's law by using given data:

| P (atm) | V ($cm^3$) | P (atm) | V ($cm^3$) |
|---|---|---|---|
| 0.350 | 0.707 | 0.951 | 0.261 |
| 0.551 | 0.450 | 1.210 | 0.205 |
| 0.762 | 0.320 | 1.521 | 0.163 |

b. Differentiate between solutions, suspensions and colloids. (6)

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# CHEMISTRY SSC-I (2nd Set)
# Student Learning Outcomes Alignment Chart

## SECTION A

**Q.1**

1. Account for pressure-volume changes in a gas using Boyle's Law.
2. Explain the effect of temperature and external pressure on vapor pressure and boiling point.
3. Use the rule that "like dissolves like" to predict the solubility of one substance in another.
4. Solve problems involving the Molarity of a solution.
5. Define oxidizing and reducing agents in a redox reaction.
6. Describe the presence of sub shells in a shell.
7. State the importance and uses of isotopes in various fields of life.
8. Recognize a compound as having ionic or covalent bonds.
9. Identify the relationship between electron configuration and the position of an element on the periodic table.
10. Explain how elements attain stability.
11. Show how cations and anions are related to the term's metals and non-metals.
12. Identify and provide examples of different branches of chemistry.

## SECTION-B

**Q.2**

i. Calculate the number of representative particles in a given number of moles of any substance.

ii. Define relative atomic mass based on C-12 scale

iii. Describe the contributions that Rutherford made to the development of the atomic theory.

iv. Write the electronic configurations of the first 18 elements in the Periodic Table.

v. Explain how shielding effect influences periodic trends.

vi. Describe the importance of noble gas electronic configurations.

vii. Describe the characteristics of an ionic/covalent bond.

viii. Distinguish between shells and sub shells.

ix. Describe with examples single, double, and triple covalent bonds

x. Differentiate between amorphous and crystalline solids.

xi. Explain the allotropic forms of solids.

xii. Explain electroplating of metals on steel (using examples of zinc, Tin and chromium plating).

xiii. Account for pressure-volume changes in a gas using Boyle's Law. Account for temperature-volume changes in a gas using Charles's Law. Summarize the properties of liquids like evaporation, vapor pressure, boiling point

xiv. Explain how shielding effect influences periodic trends.

xv. Define oxidizing and reducing agents in a redox reaction.

## SECTION-C

**Q.3** a. Explain the effect of temperature and external pressure on vapor pressure and boiling point.

b. Determine the demarcation of the periodic table into an s block and p block.

**Q.4** a. Describe the formation of cations from an atom of a metallic element.
Describe the formation of anions from an atom of a non-metallic element.

b. Differentiate among elements, compounds, and mixtures.

**Q.5** a. Account for pressure-volume changes in a gas using Boyle's Law.

b. Differentiate between solutions, suspension, and colloids

# CHEMISTRY SSC-I (2nd Set)

TABLE OF SPECIFICATION

| **Topics/Subtopics** | **Fundamentals of chemistry 1** | **Structure of atoms 2** | **Periodic table 3** | **Structure of Molecules 4** | **Physical states of matter 5** | **Solutions 6** | **Electrochemistry 7** | **Chemical Reactivity 8** | **Total marks for each Assessment** | **%age of cognitive level** |
|---|---|---|---|---|---|---|---|---|---|---|
| (Knowledge based) | 1xii(01)<br>2ii(03) | 1vii(01)<br>2iii(03) | 2xiv(03)<br>3b(05) | 1x(01) | 1ii(01)<br>2xi(03)<br>2xiii(03) | | 1v(01) | | 25 | 28.7% |
| (Understanding based) | 4b(04) | 1vi(01)<br>2viii(03) | 1ix(01)<br>2iv(03)<br>2v(03) | 1iii(01)<br>1viii(01)<br>2vii(03)<br>2ix(03) | 2x(03) | 3a(03)<br>5b(06) | 2xii(03)<br>2xv(03) | 1xi(01)<br>2vi(03) | 45 | 51.7% |
| (Application based) | 2i(03) | | | 4a(06) | 1i(01)<br>5a(04) | 1iv(01)<br>3a(02) | | | 17 | 19.5% |
| Total marks for each Topic/Subtopic | 11 | 8 | 15 | 15 | 15 | 12 | 7 | 4 | 87 | 100% |

**KEY:**

1(1)1

Question No (Part No.) Allocated Marks

**Note:** (i) The policy of FBISE for knowledge based questions, understanding based questions and application based questions is approximately as follows:

a) 30% knowledge based.
b) 50% understanding based.
c) 20% application based.

(ii) The total marks specified for each unit/content in the table of specification is only related to this model question paper.

(iii) The level of difficulty of the paper is approximately as follows:

a) 40% easy
b) 40% moderate
c) 20% difficult