POLICY GUIDELINES FOR SCIENCE SUBJECTS PAPERS

Paper Pattern and Distribution of Marks
Biology, Physics, Chemistry SSC-I

The question paper is organized into **FOUR** sections, namely: "Section A, B, C & D". Questions posed may be text based or derived/unseen but in similar pretext and difficulty level as per the lessons taught in the course. Distribution of the questions with respect to cognitive domain within each section shall roughly be around 30 percent Knowledge (K), 50 percent Understanding (U) and 20 percent Application (A).

The Questions in these subjects will be designed in such a manner that no pet-definitions are required from the candidates to be reproduced. Moreover the questions will be designed keeping in consideration the time for thought-process (particularly in U and A Cognitive Domain questions) and the length of the subsequent text (if any) to be produced by the candidates.

SECTION — A

This section consists of 12 compulsory structured part questions - Multiple Choice Questions (MCQs) of one mark each. These MCQs will preferably be designed in such a way to cover the whole course taught. These MCQs objectively test the knowledge, understanding and comprehension of the concepts of the candidates in these subjects.

SECTION — B

This section consists of question number two (02) with preferably **EIGHT** part questions – Short Response Questions (SRQs) of three (03) marks each. The candidates are required to attempt (respond to) any **SIX** SRQs for a maximum total of 18 marks in this section.

SECTION — C

This section consists of question number three (03) with preferably **SEVEN** part questions – Short Response Questions (SRQs) of three (03) marks each. The candidates are required to attempt (respond to) any **FIVE** SRQs for a maximum total of 15 marks in this section.

SECTION — D

This section consists of three (03) Extended Response Question (ERQs) of 10 marks each. Candidates are required to attempt (respond to) any two of these ERQs as per their choice and convenience for a maximum of 20 marks. These questions may comprise of two or more part questions each if deemed necessary by paper setter in order to balance out the distribution various concepts and knowledge areas from different Cognitive Domains taught in course. However none of the part questions shall be of less than 4 Marks.

Annexure for Policy Guidelines for Paper Setting

Definitions and Disclaimer

Policy guidelines for paper setting vide Notification No.6-8/FBISE/RES/CC/SSC/823 dated 8 June 2019 have been conveyed for general information. Definitions of some terminologies and disclaimers are given in this annexure.

1. **Definitions**

I. Cognitive Domains

Cognitive domain refers to development of mental skill and acquisition of knowledge.

In the questions papers developed by Federal Board of Intermediate & Secondary Education, Islamabad from hereon will be intended to test the following cognitive domains of the candidates:

- Knowledge: Approximately 30% Question in each section
- Understanding: Approximately 50% Question in each section
- Application: Approximately 20% Question in each section

i. Knowledge (K)

Knowledge refers to the ability of the candidates to recall the learned or memorized information or data.

Examples

- A child reciting the alphabets of English
- Memorization and reproducing the dates and other facts etc.

e.g. Pakistan came into being on 27th Night of Ramadan-ul-Mubarak.

Related Verbs (Command Words)

Arrange, define, duplicate, label, list, memorize, name, order, recognize, relate, recall, repeat, reproduce, state etc.

ii. Understanding (U)

Understand (also called Comprehension) refers to ability of the candidates to comprehend (a set of) information and/or situation and provide his/her response to it accordingly.

Examples

- Performing analyses and illustrating the observations
- Comprehending the concepts of Social, Natural and Physical Sciences

e.g. Discuss different types of noise and their impact on human health briefly.

Related Verbs (Command Words)

Classify, describe, discuss, explain, express, identify, indicate, locate, recognize, report, restate, review, select, translate, rephrase, differentiate, compare etc.

iii. Application (A)

Application refers to the ability to use learned material in new and concrete situation to solve problems and/or to design a schedule or task.

Examples

- Performing analyses and illustrating the observations
- Comprehending the concepts of Social, Natural and Physical Sciences

e.g. Illustrate the similes and metaphors given in the poem Daffodils.

Related Verbs (Command Words)

Apply, choose, demonstrate, dramatize, employ, illustrate, interpret, operate, practice, schedule, sketch, solve, use, write etc.

II. Sections of Paper

There are three or four (03 or 04) sections in each question paper:

i. Section-A

Contains Multiple Choice Questions (MCQs). All questions are compulsory without any external or internal choice. Usually comprises of 20% of total marks of the (theory if applicable) paper.

ii. Section B

Contains Short Response Questions (SRQ). Candidates may have external choice up to 33%. In addition to that internal choice may also be offered based upon model, content and/or nature of the subject.

- This section may contain approximately 50% of total marks in some of subjects of the (theory if applicable) paper.

iii. Section C

This section usually contains Extended Response Questions (ERQ). Candidates may have external choice in the questions. In addition to that internal choice may also be offered based upon model, content and/or nature of the subject. For ERQs it may contain approximately 30% of total marks in some subjects of the (theory if applicable) paper.

III. Choice

Sometimes the candidates are required to attempt a certain number of questions from a given pool or group of questions, it is commonly known as choice in questions.

There are two types of choices

i. External Choice

Whenever the candidates are required to solve (respond to) a certain number of questions from a given pool it is called external choice. This choice may be around 33% in a section.

e.g. 1. Answer any six parts in about 30-40 words each. (Out of eight questions)

2. Attempt any eight questions from the following. (Out of eleven questions)

ii. Internal Choice

Whenever the candidates have to solve (respond to) a question mandatorily but they have an option within the question it is called internal choice.

2. Disclaimers

I. The cognitive levels and categories written in sample model paper are for explanation purpose only. In the actual question papers administered during examination shall not contain description of these cognitive domains.

II. Association of the cognitive domains is solely based on subject expert's judgment and may be subject to errors and/or omissions.

III. In the class rooms and during teaching the candidates (students) need to be taught about the time management in accordance with allocation of marks to the questions.

Roll No: | | | | | | | Answer Sheet No: _____

Sig. of Candidate: _____ Sig. of Invigilator: _____

Federal Board SSC-I Examination
Chemistry Model Question Paper

SECTION – A

Time allowed: 20 minutes Marks: 12

Note: Section-A is compulsory. All parts of this section are to be answered on the question paper itself. It should be completed in the first 20 minutes and handed over to the Centre Superintendent. Deleting/overwriting is not allowed. Do not use lead pencil.

Q.1 Encircle the correct option i.e. A / B / C / D. All parts carry equal marks.

i. Atomic masses of H and O are 1 amu and 16 amu respectively. The molecular mass of hydrogen peroxide, (H_2O_2) is:

A. 32 amu B. 18 amu
C. 17 amu D. 34 amu

ii. Which of the following isotopes of the uranium is used in nuclear reactors and atomic bombs?

A. $^{234}_{92}U$ B. $^{235}_{92}U$
C. $^{236}_{92}U$ D. $^{238}_{92}U$

iii. Elements present in the same period of periodic table have same _____.

A. Shielding effect B. Chemical properties
C. Physical properties D. Number of valence electrons

iv. Hydrogen bonding is involved in:

A. Formation of crystals in NaCl
B. Adhesive action of paints
C. Van der Waal's force
D. Conductance of electricity

v. In Hydrogen Iodide (HI), the bond is:

A. Non polar covalent bond B. Co-ordinate covalent bond
C. Polar covalent bond D. Ionic bond

vi. In which of the following processes speed of the particles decreases?

A. Melting B. Boiling
C. Sublimation D. Condensation

vii. The freezing point of water is $0^{\circ}C$ while its boiling point is $100^{\circ}C$ at STP, its physical state at $120^{\circ}C$ will be?

A. Gas B. Liquid
C. Solid D. Mixture of gas and liquid

DO NOT WRITE ANYTHING HERE

viii. Which of the following is used for cooking utensils?

A. Gold B. Iron
C. Plastics D. Silver

ix. The mass / mass concentration of a solution is 50 %. If the mass of the solution is 500 grams then the mass of solute will be:

A. 220 g B. 50 g
C. 300 g D. 250 g

x. By-product(s) produced in Nelson's cell is/are:

A. NaOH B. H_2 only
C. Cl_2 only D. both B and C

xi. The oxidation state of Mn in $KMnO_4$ is:

A. +8 B. +3
C. +7 D. +4

xii. Chemical reactivity of metals is due to their:

A. Electropositive character B. Electronegative character
C. High electron affinity D. High ionization energy

For Examiner's use only:

Total Marks:	**12**
Marks Obtained:	

Federal Board SSC-I Examination
Chemistry Model Question Paper

Time allowed: 2.40 hours Total Marks: 53

Note: Answer any sixe parts from Section 'B' and attempt any five parts from Section-C. Attempt any two questions from Section 'D' on the separately provided answer book. Use supplementary answer sheet i.e. Sheet–B if required. Write your answers neatly and legibly.

SECTION – B (Marks 18)
(Chapter 1-4)

Q.2 Attempt any **SIX** parts from the following. All parts carry equal marks. (6 × 3 = 18)

i. Why one mole of Oxygen gas and one mole of oxygen atoms have different masses?

ii. Give three differences between atom and molecule.

iii. Write atomic number and names of elements X, Y, Z, where:
$X = 1s^2 2s^2 2p^4$, $Y = 1s^2 2s^2 2p^6 3s^1$, $Z = 1s^2 2s^2 2p^6 3s^2 3p^3$

iv. a. Give notations for sub-shells of M-shell.
b. Arrange the sub-shells of M-shell in order of increasing energy.

v. Determine the demarcation of the periodic table into 's block' and 'p block'.

vi. The elements present in a group of periodic table have similar chemical properties. Give reason and a suitable example.

vii. What type of bond exists between two non-metallic atoms of different elements? Give an elaborative example.

viii. With the help of a suitable diagram show the conductance of electricity through molten NaCl. Also write the reactions at Anode and Cathode.

SECTION – C (Marks 15)
(Chapter 5-8)

Q.3 Attempt any **FIVE** parts from the following. All parts carry equal marks. (5 × 3 = 15)

i. How does temperature affect the vapour pressure of a liquid?

ii. Give three differences between heavy water and ordinary water.

iii. What will happen, when a crystal of sodium Sulphate is added to
a. An unsaturated solution of sodium sulphate
b. Saturated solution of sodium sulphate
c. Supersaturated solution of sodium sulphate

iv. Write three different units of pressure? Give their relation with one another.

v. Aluminium has higher tendency to oxidize than iron but still it is considered as safe metal. Justify your answer with reason.

vi. Find the oxidation state of underlined atoms.

a) $\underline{S}_2Cl_2$ b) $\underline{Zn}(OH)_2$ c) $\underline{O}F_2$

vii. Oxidizing power of Fluorine is the highest among other halogens. Write any two chemical reactions to show this property of Fluorine.

SECTION – D (Marks 20)

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

Q.4 **a.** How many moles and atoms are there in 60 grams of Calcium? (4)

b. What were the defects in Rutherford's atomic model and how were these removed by Bohr? (6)

Q.5 **a.** State and explain ionic bond and its formation between sodium and chlorine atoms to form sodium chloride. (5)

b. State Charles's law. If a balloon occupies $885\ cm^3$ volume at 20^oC and $794\ cm^3$ at -10^oC. Prove that this data is according to Charles's law. (5)

Q.6 **a.** Sketch a Daniel cell, label cathode & anode, show the direction of flow of electrons and write down chemical reactions occurring at cathode & anode. (6)

b. Copper, silver and gold are called noble metals. Briefly explain their inertness toward chemical reactions. (4)

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SUPLEMENTARY TABLE

Atomic No	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Symbol	H	He	Li	Be	B	C	N	O	F	Ne	Na	Mg	Al	Si	P	S	Cl	Ar	K	Ca
Mass no	1	4	7	9	11	12	14	15	19	20	23	24	27	28	31	32	35	40	39	40