NOTIFICATION

In continuation of this office Notification No.0-1/FBISE/RESH/CC/SSC/605 dated 27 March 2012, revised Curriculum 2006 and model question paper in the subject of Chemistry for Class-X is forwarded for its implementation w.e.f. the academic session 2013-15. Accordingly the students of Class-X to be admitted in April 2013 shall be examined in accordance with revised curriculum and model question paper, in the SSC Part-II Annual Examination 2014 and onwards.

2. The textbook “An interactive approach to Chemistry 10” printed by National Book Foundation, Islamabad may be consulted for reference and supplementary material.

3. A copy of the same has been hoisted on the FBISE website www.fbise.edu.pk.

All heads of institutions affiliated with FBISE at SSC level

Copy to:
1. Director General, Federal Directorate of Education, G-9/4, Islamabad
2. Director Education, FGEI (C&G), Sir Syed Road, The Mall, Rawalpindi Cantt
3. Director Education (Schools/Colleges), PAF Rear Air HQs, Peshawar Cantt
4. Director Education, Directorate of Naval Educational Services, Naval HQ, Islamabad
5. Director, Army Public Schools and Colleges System Secretariat, GHQ, Rawalpindi
6. General Manager (Education), Fauji Foundation Head Office, Welfare Division, Chaklala, Rawalpindi
7. Director Education, OPF Head Office, F-5, Islamabad
8. The Secretary, National Book Foundation, G-8/4, Islamabad
9. All GSO-I
10. Incharge, Website FBISE, Islamabad
11. Incharge, FBISE Sub-Office, Gilgit
12. All Sectional Heads of FBISE, Islamabad
5. Biochemistry
   Introduction
   13.1 Carbohydrates
       13.1.1 Monosaccharides
       13.1.2 Oligosaccharides
       13.1.3 Polysaccharides
       13.1.4 Sources and Uses
   13.2 Proteins
       13.2.1 Amino Acids as Building Blocks of Proteins
       13.2.2 Sources and Uses
   13.3 Lipids
       13.3.1 Fatty Acids
       13.3.2 Sources and Uses
   13.4 Vitamins
       13.4.1 Types of Vitamins
       13.4.2 Importance of Vitamins

   Introduction
   14.1 Composition of Atmosphere
   14.2 Layers of Atmosphere
       14.2.1 Troposphere
       14.2.2 Stratosphere
   14.3 Pollutants
       14.3.1 Major Air Pollutants
       14.3.2 Sources of Air Pollutants
   14.4 Acid Rain and Its Effects
   14.5 Ozone Depletion and Its Effects

7. Environmental Chemistry II: Water
   Introduction
   15.1 Water
       15.1.1 Properties of Water
       15.1.2 Water as Solvent
   15.2 Soft and Hard Water
       15.2.1 Types of Hardness of Water
       15.2.2 Methods of Removing Hardness
       15.2.3 Disadvantages of Water Hardness
   15.3 Water Pollution
       15.3.1 Industrial Wastes
       15.3.2 Household Wastes
       15.3.3 Agricultural Waste
   15.4 Water Borne Diseases

8. Chemical Industries
   Introduction
   16.1 Basic Metallurgical Operations with Reference to Copper
       16.1.1 Concentration
       16.1.2 Extraction
       16.1.3 Electro-Refining
   16.2 Manufacture of Sodium Carbonate by Solvay’s Process
       16.2.1 Raw Materials
       16.2.2 Basic Reactions
       16.2.3 Flow Sheet Diagram
   16.3 Manufacture of Urea
       16.3.1 Raw Materials
       16.3.2 Reaction
       16.3.3 Flow Sheet Diagram
   16.4 Petroleum Industry
       16.4.1 Petroleum
       16.4.2 Origin of Petroleum
       16.4.3 Mining of Petroleum
       16.4.4 Important Fractions of Petroleum
CHEMISTRY
For Class-X

1. Chemical Equilibrium
   Introduction
   9.1 Reversible Reaction and Dynamic Equilibrium
   9.2 Law of Mass Action and Derivation of the Expression for the Equilibrium Constant
   9.3 Equilibrium Constant and Its Units
   9.4 Importance of Equilibrium Constant

2. Acids, Bases, and Salts
   Introduction
   10.1 Concepts of Acids and Bases
       10.1.1 Arrhenius Concept of Acids and Bases
       10.1.2 Bronsted Concept of Acids and Bases
       10.1.3 Lewis Concept of Acids and Bases
   10.2 pH Scale
   10.3 Salts
       10.3.1 Preparation
       10.3.2 Types of
       10.3.3 Uses of some Salts

3. Organic Chemistry
   Introduction
   11.1 Organic Compounds
   11.2 Sources of Organic Compounds
       11.2.1 Coal
       11.2.2 Petroleum
       11.2.3 Natural Gas
       11.2.4 Plants
       11.2.5 Synthesis in the Lab
   11.3 Uses of Organic Compounds
   11.4 Alkanes and Alkyl Radicals
   11.5 Functional Groups
       11.5.1 Functional Groups Containing Carbon, Hydrogen and Oxygen
       11.5.2 Functional Groups Containing Carbon, Hydrogen and Nitrogen
       11.5.3 Functional Groups Containing Carbon, Hydrogen and Halogens
       11.5.4 Double and Triple Bond

4. Hydrocarbons
   Introduction
   12.1 Alkanes
       12.1.1 Preparation
           12.1.1.1 Hydrogenation of Alkenes and Alkynes
           12.1.1.2 Reduction of Alkyl Halides
       12.1.2 Important Reactions
           12.1.2.1 Halogenation
           12.1.2.2 Combustion
   12.2 Alkenes
       12.2.1 Preparation
           12.2.1.1 Dehydration of Alcohols
           12.2.1.2 Dehydrohalogenation of Alkyl Halides
       12.2.2 Important Reactions
           12.2.2.1 Addition of Halogens
           12.2.2.2 Addition of Hydrogen Halides
           12.2.2.3 Oxidation with KMnO4
   12.3 Alkynes
       12.3.1 Preparation
           12.3.1.1 Dehalogenation of Adjacent Dihalides
           12.3.1.2 Dehalogenation of Tetrahalides
       12.3.2 Important Reactions
           12.3.2.1 Addition of Halogens
           12.3.2.2 Oxidation with KMnO4
# LIST OF PRACTICALS

<table>
<thead>
<tr>
<th>Chapter 1:</th>
<th>Chemical Equilibrium</th>
<th>None</th>
<th>None</th>
<th>None</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chapter 2:</td>
<td><strong>Acids, Bases and Salts</strong></td>
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<tr>
<td>1.</td>
<td>Identify sodium, calcium, strontium, barium, copper, potassium radicats by flame test.</td>
<td>platinum wire, watch glass, burner, matches</td>
<td>salt of each of sodium, calcium, strontium, barium, copper, potassium, concentrated HCl</td>
<td></td>
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<tr>
<td>2.</td>
<td>Standardize the given NaOH solution volumetrically.</td>
<td>pipette, burette, funnel, conical flask, beaker</td>
<td>standard solution of HCl, solution of NaOH, phenolphthalein</td>
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<tr>
<td>3.</td>
<td>Standardize the given HCl solution volumetrically.</td>
<td>pipette, burette, funnel, conical flask, beaker</td>
<td>standard solution of NaOH, solution of HCl, phenolphthalein</td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>Determine the exact molarity of the Na₂CO₃ solution volumetrically.</td>
<td>pipette, burette, funnel, conical flask, beaker</td>
<td>standard solution of HCl, solution of Na₂CO₃, methyl orange</td>
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<tr>
<td>5.</td>
<td>Determine the exact molarity of a solution of oxalic acid volumetrically.</td>
<td>pipette, burette, funnel, conical flask, beaker</td>
<td>standard solution of NaOH, solution of oxalic acid, phenolphthalein</td>
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<tr>
<td>6.</td>
<td>Demonstrate that some natural substances are weak acids.</td>
<td>dropper, knife, test tubes, 2 test tube racks, beaker, gas burner, wire gauze, matches, dropper, safety goggles</td>
<td>citrus fruits, pH paper</td>
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<tr>
<td>7.</td>
<td>Classify substances as acidic, basic or neutral</td>
<td>six 100-cm³ beakers, red and blue litmus papers, safety goggles</td>
<td>red and blue litmus paper, 0.1% bromthymol blue, 0.1m solutions of various acids (hydrochloric, nitric, sulphuric, and acetic acids), bases (sodium carbonate, hydroxides of sodium, potassium, calcium and magnesium) and neutral substances (methanol, ethanol, sodium chloride and water)</td>
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<tr>
<td>Chapter 3:</td>
<td><strong>Organic Chemistry</strong></td>
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<tr>
<td>1.</td>
<td>Identify aldehydes using Fehling's test and Tollen's test.</td>
<td>test tubes, test tube holder, test tube rack, burner, water bath, matches, dropper, safety goggles</td>
<td>Fehling's solution, Tollen's reagent, glucose solution, distilled water</td>
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<tr>
<td>2.</td>
<td>Identify ketones using 2, 4- dinitrophenyl hydrazine test.</td>
<td>test tubes, test tube holder, test tube rack, burner, matches, dropper, safety goggles</td>
<td>fructose solution, 2,4-dinitrophenyl hydrazine solution, distilled water</td>
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<tr>
<td>3.</td>
<td>Identify carboxylic acids using sodium carbonate test.</td>
<td>test tubes, test tube holder, test tube rack, burner, matches, dropper, safety goggles</td>
<td>acetic acid solution, solid sodium carbonate, distilled water</td>
<td></td>
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<tr>
<td>4.</td>
<td>Identify phenol using Ferric Chloride test.</td>
<td>test tubes, test tube holder, test tube rack, burner, matches, dropper, safety goggles</td>
<td>phenol solution, freshly prepared ferric chloride solution, distilled water</td>
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<td>Chapter 4:</td>
<td><strong>Hydrocarbons</strong></td>
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<td>1.</td>
<td>Identify saturated and unsaturated organic compounds by KMnO₄ test.</td>
<td>test tubes, test tube holder, test tube rack, dropper</td>
<td>cinnamic acid solution, KMnO₄ solution, distilled water</td>
<td></td>
</tr>
<tr>
<td>Chapter 5: Biochemistry</td>
<td>1. Demonstrate that sugar decomposes into elements or other compounds.</td>
<td>China dish, burner, tripod stand, wire gauze, matches, spatula, safety goggles</td>
<td>sugar</td>
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<tr>
<td>Chapter 6: Atmosphere</td>
<td>None</td>
<td>None</td>
<td>None</td>
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<tr>
<td>Chapter 7: Water</td>
<td>1. Demonstrate the softening of water by removal of calcium ions from hard water.</td>
<td>2 test tubes and stoppers, beaker</td>
<td>distilled water, small bar of soap, sodium sulphate solution, calcium sulphate solution and sodium bicarbonate solution</td>
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<tr>
<td>Chapter 8: Chemical Industries</td>
<td>None</td>
<td>None</td>
<td>None</td>
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</table>
SECTION - A

Time allowed: 20 minutes
Marks: 12

Note: Section-A is compulsory and comprises pages 1-2. 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  Insert the correct option i.e. A / B / C / D in the empty box opposite each part. Each part carries one mark.

   i. Ammonia is synthesized by Haber process according to the following equilibrium:

      \[ \text{N}_2(g) + 3\text{H}_2(g) \rightleftharpoons 2\text{NH}_3(g) \]

      The unit of Kc for this reaction is:

      A. \( \text{mol}^2\text{dm}^{-6} \)  
      B. \( \text{mol}^2\text{dm}^{-3} \)  
      C. \( \text{mol}^2\text{dm}^{-4} \)  
      D. \( \text{mol} \text{ dm}^{-3} \)

   ii. Which one of the following species is a Lewis acid?

      A. \( \text{NH}_3 \)  
      B. \( \text{BH}_3 \)  
      C. \( \text{PH}_3 \)  
      D. \( \text{AlH}_4^- \)

   iii. Which of the following is an alcohol?

      A. \( \text{CH}_3\text{CH}_2\text{O}-\text{CH}_2\text{CH}_3 \)  
      B. \( \text{CH}_3\text{CH}_2\text{COOH} \)  
      C. \( \text{CH}_3\text{COCH}_3 \)  
      D. \( \text{CH}_3\text{CH}_2\text{OH} \)

   iv. Dehydration means the removal of:

      A. Hydrogen  
      B. Water  
      C. Halogen  
      D. Hydrogen halide

   v. How many amino acids are synthesized in our bodies?

      A. 10  
      B. 15  
      C. 20  
      D. 25

   vi. Which gas has highest percentage in air?

      A. \( \text{O}_3 \)  
      B. \( \text{O}_2 \)  
      C. \( \text{N}_2 \)  
      D. \( \text{CO}_2 \)

   vii. What is formed when \( \text{CO}_2 \) reacts with water?

      A. \( \text{H}_2\text{CO}_2 \)  
      B. \( \text{H}_2\text{CO} \)  
      C. \( \text{H}_2\text{CO}_3 \)  
      D. \( \text{HCO}_3^- \)
viii. \( \text{CuFeS}_2 \) is an ore of metal:
A. Iron  
B. Silicon  
C. Sodium  
D. Cooper

ix. Percentage of Nitrogen in Urea is:
A. 35  
B. 21.2  
C. 46.6  
D. 80

x. The molecular formula of hexane is:
A. \( \text{CH}_4 \)  
B. \( \text{C}_3\text{H}_8 \)  
C. \( \text{C}_6\text{H}_{14} \)  
D. \( \text{C}_4\text{H}_{10} \)

xi. Quick lime is produced by the decomposition lime in the lime Kiln according to the following equation:
\[ \text{CaCO}_3(s) \rightarrow \text{CaO}(s) + \text{CO}_2(g) \]
The reaction goes to completion because:
A. \( \text{CO}_2 \) is a gas  
B. \( \text{CaO} \) is not dissociated  
C. \( \text{CO}_2 \) escapes continuously  
D. \( \text{CaCO}_3 \) is less stable than \( \text{CaO} \)

xii. In a solution of sodium hydroxide, the concentration of \( \text{OH}^- \) ions is \( 1.0 \times 10^{-5}\text{M} \). The concentration of \( \text{H}^+ \) ions would be:
A. \( 1.0 \times 10^{-5}\text{M} \)  
B. \( 1.0 \times 10^{-7}\text{M} \)  
C. \( 1.0 \times 10^{-9}\text{M} \)  
D. \( 1.0 \times 10^{-11}\text{M} \)
Q.2 Attempt any eleven parts from the following. The answer of each part should not exceed 4 to 5 lines.

(i) Define equilibrium state. How a dynamic equilibrium is established in a reversible chemical reaction.

(ii) What is key reaction of neutralization? It is an exothermic reaction. Explain with suitable reason.

(iii) Differentiate between saturated and unsaturated hydrocarbons.

(iv) Identify the products A and B in following reactions:

\[
\text{Propane} \xrightarrow{\text{Br}_2} A \xrightarrow{\text{alcohol}} B
\]

(v) Phosphoric acid is a tribasic acid. When reacted with sodium hydroxide solution, it forms series of salt by the partial or complete replacement of hydrogen atoms. Write names and chemical formula of the salts formed.

(vi) Define the following:

Catenation and Isomerism

(a) What is an amino acid. Name the functional group in an amino acid.

(b) Draw peptide linkage.

(viii) Complete the following reactions:

a. \( \text{SO}_2(g) + \text{O}_2(g) \rightarrow \)

b. \( \text{C}_2\text{H}_2(g) + \text{O}_2(g) \rightarrow \)

(c. \( \text{CO}_2(g) + \text{O}_2(g) \rightarrow \)

(ix) How acid rain is produced? How does it damage the beauty of our marble building and statues. Write chemical reaction of it.

(x) Wood, oil and electric fires required different techniques to put them out. How? Explain.

(xi) How the permanent hardness of water is removed by ion exchange resins?

(xii) Define fatty acids. Give two examples.
(xiii) How the process coagulation remove dirt particles and bacteria from water?
(xiv) Draw the structural formula of the following compounds:
   a. Pyridine  b. Furan  c. neo-pentane
(xv) Write any three uses of salts.

SECTION – C
(Marks: 20)

Note: Attempt any two questions.  

(2×10=20)

Q.3  
   a. State law of mass action. Derive the expression for equilibrium constant Kc for
      the following reaction:
      \[ aA + 3B \xrightarrow{K_r} 4C + dD \]  
      \[ (1+3) \]
   b. Give the Lewis concept of acids and bases. Explain with the help of equations and
      suitable reasons that CaO is a Lewis base and BCl3 is a Lewis acid.  
      \[ (2+2+2) \]

Q.4  
   (a) Define vitamins. What are types of vitamins and explain them.  
       \[ (1+1+4) \]
   (b) How will you prepare the following compounds starting from ethene:
       (1+4)
       i. Ethylene Glycol  ii. 1,2-Dibromo ethane
       iii. CO2  iv. Ethane

Q.5  
   (a) What has to be done to crude oil before it is used?  
   (b) Develop flow sheet diagram of Solvay process.  
   (c) What is meant by chlorination? How it purify the water?  
      \[ (3+4+3) \]
Federal Board SSC-II Examination
Chemistry Practical Model Question Paper

Time allowed: 2 hours

1. Identify the given compounds A & B with the help of chemical test. (2)

2. Determine the exact molarity of solution of Na₂CO₃ (OR) Standardize the given NaOH solution volumetrically. (4)

3. Note Book (2)

4. Viva Voce (2)

Note: No Procedure is required for minor experiment (only performance).