PUNJAB EDUCATION, CURRICULUM, TRAINING AND ASSESSMENT AUTHORITY

Accelerated Learning Program (ALP) for Chemistry Grade-12 for Annual Exam-(2026-27)

Note: All types of questions for BISE Examination paper will be prepared from the entire content of the textbook other than those topics and questions which have been excluded / deleted in the Smart Syllabus (ALP) for Chemistry-12 (Session 2026-27).

Chapter No.	Chapter Name	Topics and Questions Deleted	Page No.
17	Group 2 Elements	**17.4:** Solubility of Group 2 Sulphates and Hydroxide **17.5:** Complex Ion Formation **17.8:** Uses of Group 2 Compounds Multiple Choice Questions (MCQs): viii, ix & x Short Answers Questions (SAQs): a, b, f & h Constructed Response Questions (CRQs): C Descriptive Questions (DQs): 06 Quick Check: 17.3 & 17.4	(P 7-8) (P 8-9) (P 10-11)
18	Transition Metals	**18.9:** Stereoisomerism in Transition metal complexes **18.10:** Redox Reaction of Transition metals Multiple Choice Questions (MCQs): IX Short Answers Questions (SAQs): g, j & k Constructed Response Questions (CRQs): a & b Descriptive Questions (DQs): 18.7 & 18.8 Quick Check: 18.7 & 18.8	(P 28-29) (P 30-31)
19	Basic of Organic chemistry	**19.8:** Mechanisms of Chemical Reactions **19.9:** Isomerism **19.10:** Stereochemistry in drug development Multiple Choice Questions (MCQs): iii, V, VI, VII, VIII & IX Short Answers Questions (SAQs): a, f, g, h, & i Constructed Response Questions (CRQs): b, c, & d Descriptive Questions (DQs): 19.5, 19.6 & 19.7 Quick Check: 19.6 (c) & 19.7	(P 46-47) (P 47-51) (P 52)
20	Aromatic Hydrocarbon	**20.3:** Comparison of reactivity of benzene with alkanes and alkene. **20.6:** Other Reactions of Benzene Multiple Choice Questions (MCQs): Nil Short Answers Questions (SAQs): e Constructed Response Questions (CRQs): a & b Descriptive Questions (DQs): Nil Quick Check: 20.7	**(**P 60) (P 65-67)

Chapter No.	Chapter Name	Topics and Questions Deleted	Page No.
21	Halogenoalkanes	**21.4:** Example of reaction of Halogenoalkanes **21.5:** Halogenoarenes Multiple Choice Questions (MCQs): IX Short Answers Questions (SAQs): g, h & i Constructed Response Questions (CRQs): e Descriptive Questions (DQs): 21.6 Quick Check: 21.3 & 21.4	(P 78-79) (P 80)
22`	Nitrogen and Sulphur	**22.2:** Acidity of Alcohol & Phenols **22.6.2:** Reaction of Aromatic in Phenols Multiple Choice Questions (MCQs): VII & VIII Short Answers Questions (SAQs): b, C (ii) & f Constructed Response Questions (CRQs): a & d Descriptive Questions (DQs): 22.4 & 22.7 Quick Check: 22.2 & 22.5	(P 86-87) (P 92-93)
23	Carbonyl Compound and Carboxylic Acid	**23.3:** Oxidation of Aldehyde and Ketone **23.8:** Acyl Chlorides **23.9:** Hydrolysis of Acyl Chlorides, Alkyl Chlorides & Aryl Chlorides Multiple Choice Questions (MCQs): II & X Short Answers Questions (SAQs): c & g Constructed Response Questions (CRQs): c Descriptive Questions (DQs): 23.9 Quick Check: 23.5	(P 102-103) (P 110) (P 110-111)
24	Organic Nitrogen Compound	**24.3.2:** Distinction between Primary and Secondary Amines **24.3.3:** Reaction of Phenyl amines (Aromatic Amines) **24.4:** Alkanenitriles **24.5:** Amides Multiple Choice Questions (MCQs): IV, V, VI, VII & VIII Short Answers Questions (SAQs): c, d, f, h & k Constructed Response Questions (CRQs): a, b, & c Descriptive Questions (DQs): 24.7 Quick Check: 24.3	(P 119) (P 119-121) (P 122) (P 122-124)
25	Organic Synthesis	**25.2:** Retro synthesis and Synthesis of Some Compound **25.3:** Synthesis of Pharmaceutical Product **25.4:** Use of artificial intelligence (AI) in drug Designing Multiple Choice Questions (MCQs): VII Short Answers Questions (SAQs): h & j Constructed Response Questions (CRQs): b Descriptive Questions (DQs): 25.5 & 25.6 Quick Check: 25.2 & 25.3	(P 132-133) (P 134-136) (P 137)

Chapter No.	Chapter Name	Topics and Questions Deleted	Page No.
26	Polymers	**26.2:** Nylon **26.3**: Identification of the type of a polymer, repeat Unit and monomers from a polymer section **26.5:** Challenge of Non-degradable Polymer **26.6:** Polymer in Artificial Organs Multiple Choice Questions (MCQs): IV, V, VI & IX Short Answers Questions (SAQs): a, d, f, h, i & J Constructed Response Questions (CRQs): b Descriptive Questions (DQs): 26.6 Quick Check: 26.1 & 26.2	(P 145-146) (P 147-148) (P 150-151) (P 151-152)
27	Biochemistry	**27.1.1:** Nutritional Important of carbohydrates **27.2.2:** Biological function of Proteins **27.3:** Enzymes As Biocatalysis **27.4.4:** Nutritional and Biological important of Lipids **27.5:** Nucleic Acids **27.6:** Minerals Multiple Choice Questions (MCQs): IV, V, IX, & X Short Answers Questions (SAQs): f, g, h, i, j, k & l Constructed Response Questions (CRQs): d & e Descriptive Questions (DQs): 27.7 Quick Check: 27.1 (c), 27.2 (d, e), 27.3 & 27.5	(P 158) (P 161-162) (P 162-164) (P 166) (P 167-169) (P 169-170)
28	Chromatography	**28.4:** Gas Chromatography Multiple Choice Questions (MCQs): VII, VIII, IX & X Short Answers Questions (SAQs): f, g & h Constructed Response Questions (CRQs): b Descriptive Questions (DQs): 28.6 Quick Check: 28.2	(P 176-178)
29	Spectroscopy-1	**29.1:** Index of hydrogen Deficiency **29.2**: Atomic Spectrum **29.6:** Mass Spectrometer Multiple Choice Questions (MCQs): V, VI, VII, & VIII Short Answers Questions (SAQs): a & d Constructed Response Questions (CRQs): a Descriptive Questions (DQs): 29.5 & 29.6 Quick Check: 29.1 & 29.4	(P 182-183) (P 184) (190-194)

Chapter No.	Chapter Name	Topics and Questions Deleted	Page No.
30	Spectroscopy-2 NMR	**30.5:** Prediction H^1 NMR Spectrum for a given Molecules **30.6**: Determination of the possible Structure of a molecule from H^1 NMR **30.7:** ^{13}C NMR Spectroscopy Multiple Choice Questions (MCQs): VII, VIII, IX & X Short Answers Questions (SAQs): c, e & f Constructed Response Questions (CRQs): c & d Descriptive Questions (DQs): 30.6 Quick Check: 30.5, 30. 6 & 30.7	(P 205) (P 206) (207-209)
31	Spectroscopy-2 NMR	**31.2:** Toxicity and Recycling in Material Science **31.7**: Energy Density and Specific Energy **31.8:** Solar energy and Photovoltaic Cell Multiple Choice Questions (MCQs): V, VI & VIII Short Answers Questions (SAQs): a, b, d, g & h Constructed Response Questions (CRQs): d & e Descriptive Questions (DQs): 31.7 Quick Check: 31.2, & 31.5	(P 216-218) (P 223-224) (P 224-225)
32	Medicine, Agriculture and Industry	**32.1** Therapeutic Index and therapeutic windows **32.3.2** Opiates and Opioids receptors **32.4** Challenging in treating viral infections **32.8** Effect of Climate Change on crops **32.9** Genetic Engineering **32.13** Applications of Industrial Chemistry **32.14** Safety measure and Precautions Multiple Choice Questions (MCQs): III & VI Short Answers Questions (SAQs): a, c, d & j Constructed Response Questions (CRQs): a & c Descriptive Questions (DQs): 32.5, 32.6 & 32.8 Quick Check: 32.1, 32.2 (c) & 32.3	(P 228-229) (P 230) (P 231) (P 234-235) (P 235) (P 238) (P 238)
33	Water	**33.4:** Water Pollution due to human activities **33.5**: Effect of water pollution on the environment **33.7:** Protection and Conversation of water Resources **33.8:** Rules and regulations regarding water pollution and conservation Multiple Choice Questions (MCQs): IV Short Answers Questions (SAQs): e & g Constructed Response Questions (CRQs): c & d Descriptive Questions (DQs): 33.7 Quick Check: 33.4 & 33.5	(P 249-250) (P 250-251) (253-254) (P 254)

Instructions for Preparation of Exam Paper of Chemistry for Class 12

ESSENTIAL INSTRUCTIONS FOR PAPER SETTERS

The Chemistry paper for class 12 will consist of 85 marks. Timing of the paper will be three hours. The paper will be made as per following details:

<table>
<tr><td>Part-I:
Objective:</td><td>Q-1:
One multiple-choice question (MCQ) from each chapter.</td><td>1 × 17= 17</td></tr>
<tr><td rowspan="3">Part-II:
Subjective:</td><td>Q-2:
8 short answer questions must be answered out of 12. The details are as follows:
<table>
<tr><td>Chapter</td><td>17</td><td>18</td><td>19</td><td>20</td><td>24</td><td>25</td></tr>
<tr><td>No. of Short Questions</td><td>1</td><td>1</td><td>3</td><td>2</td><td>3</td><td>2</td></tr>
</table></td><td>2 × 8 = 16</td></tr>
<tr><td>Q-3:
8 short answer questions have to be answered out of 12. The details are as follows:
<table>
<tr><td>Chapter</td><td>21</td><td>22</td><td>23</td><td>27</td><td>28</td><td>29</td></tr>
<tr><td>No. of Short Questions</td><td>1</td><td>1</td><td>2</td><td>2</td><td>3</td><td>3</td></tr>
</table></td><td>2 × 8 = 16</td></tr>
<tr><td>Q-4:
6 short answer questions have to be answered out of 9. The details are as follows:
<table>
<tr><td>Chapter</td><td>26</td><td>30</td><td>31</td><td>32</td><td>33</td></tr>
<tr><td>No. of Short Questions</td><td>1</td><td>2</td><td>2</td><td>2</td><td>2</td></tr>
</table></td><td>2 × 6 = 12</td></tr>
<tr><td>Part-III:
Subjective:</td><td rowspan="2">This section will contain five detailed questions bifurcated in two-part a & b (carrying 4 & 4 marks each) and students must attempt 3 questions The detail is as follows:
Q-5:
<table>
<tr><td>Chapter</td><td>17</td><td>21</td></tr>
<tr><td>Part</td><td>a</td><td>b</td></tr>
</table>
Q-6:
<table>
<tr><td>Chapter</td><td>18</td><td>26</td></tr>
<tr><td>Part</td><td>a</td><td>b</td></tr>
</table>
Q-7:
<table>
<tr><td>Chapter</td><td>20</td><td>31</td></tr>
<tr><td>Part</td><td>a</td><td>b</td></tr>
</table></td><td>3 × 8 = 24</td></tr>
<tr><td></td><td></td></tr>
</table>

Q-8:

Chapter	**22**	**32**
Part	a	b

Q-9:

Chapter	**23**	**33**
Part	a	b

MODEL PAPER OF CHEMISTRY FOR CLASS-12

Objective Type

Time allowed: 20 Min. **Max. Marks: 17**

Note: Four possible answers A, B, C and D to each question are given. The choice which you think is correct, fill that circle with marker or pen ink in the answer book. Cutting or filling two or more circles will result in zero marks in that question

(i) Which Group 2 oxide forms the most alkaline solution in water?
(A) Beryllium oxide (B) Magnesium oxide
(C) Calcium oxide (D) Strontium oxide

(ii) In the complex ion, $[Fe(CN)_6]^{4-}$, what is coordination number of central metal ion?
(A) 2 (B) 4 (C) 6 (D) 8

(iii) Which of the following is organic in nature?
(a) CO_2 (b) CS_2
(c) HCN (d) $CHCl_3$

(iv) Bromine reacts more readily with phenol than with benzene. This is because the
(A) benzene ring in phenol is more susceptible to nucleophilic attack
(B) benzene ring in phenol is deactivated because the oxygen of the OH group is very electronegative
(C) lone pair of electrons on the oxygen atom in phenol overlap with the delocalised electrons in the benzene ring
(D) lone pair of electrons on the oxygen atom enable phenol to act as an electrophile

(v) Which one of the following is not a nucleophile?
(a) H_2O (b) H_2S (c) BF_3 (d) NH_3

(vi) Dehydration of alcohol is an example of:
(a) Substitution Reaction (b) Addition Reaction
(c) Elimination Reaction (d) Redox Reaction

(vii) Ketones are prepared by the oxidation of
(a) Primary (b) Secondary (c) Tertiary (d) Phenol

(viii) Which one of the following bases is a strongest one?
(a) Ammonia (b) Ethyl amine
(c) Phenyl amine (d) Diethyl amine

(ix) Which functional group is formed when carboxylic acid reacts with alcohol in the presence of an acid as catalyst?
(a) Alkane (b) Alcohol (c) Aldehdye (d) Ether

(x) Which pair of monomers reacts to form a polyester?
A. Diamine and dicarboxylic acid B. Diol and dicarboxylic acid
C. Ethene and chloroethene D. Amino-carboxylic acid

(xi) Glucose is a building block for, except:
(a) Cellulose (b) Glycogen
(c) Inulin (d) Starch

(xii) A substance has a very low R_f value. What does this indicate?
(a) It is insoluble in the solvent
(b) It is highly soluble in the solvent
(c) It strongly sticks to the paper
(d) It has a high density

(xiii) The types of transitions possible in UV-visible region for a compound with molecular formula C_2H_4 are:
(a) $n \rightarrow \pi^*$ (b) $n \rightarrow \sigma^*$
(c) $\sigma \rightarrow *$ (d) $\pi \rightarrow \pi^*$

(xiv) NMR relies on the magnetic properties of nuclei known as:
A) Chemical shift B) Nuclear density

C) Nuclear spin D) Signal intensity

(xv) Which property makes ceramics suitable for furnace bricks?
(a) Conductivity (b) Low density
(c) High melting point (d) Flexibility

(xvi) Which N-P-K nutrient promotes protein synthesis and chlorophyll?
A. Nitrogen B. Phosphorus C. Potassium D. Sulphur

(xvii) Which condition is a direct result of Cadmium (Cd) replacing Calcium (Ca) in the skeletal system?
(a) Minamata disease (b) Blue Baby Syndrome
(c) Itai-itai disease (d) Chloracne

Subjective Type (Part I)

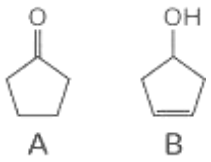
Time allowed: 2.40 Hrs. **Max. Marks: 68**

Q. 2: Write short answers to any eight (08) questions: (8×2=16)

i. Give the products of the thermal decomposition of Strontium nitrate. Write the chemical equation.
ii. How do transition metals function as effective catalysis? Give some example.
iii. Alkanes have no functional group. Justify
iv. Give the systematic name of following compounds
(i) CH_3-CH_2-CN (ii) $CH_3COCH_2CH_2$-CH_3 (iii) CH_3CH_2COOH
v. Define electrophile and nucleophile with two examples each.
vi. Explain what is meant by the term delocalized π-electrons.
vii. What is meta directing group.
viii. What is Zwitter Ion?
ix. Give two Preparation of phenylamine.
x. Give two Preparation of secondary amine.
xi. Difference between synthesis and retrosynthesis.
xii. How is carboxylic acid converted to an amide group?

Q. 3: Write short answers to any eight (08) questions: (8×2=16)

i. How does chloropropane react with alcoholic KOH.
ii. How do you convert Propanol to propan-1-ol?
iii. How is ethanol converted to acetic acid?
iv. Give the reaction of ethanoyl chloride with phenol?
v. How is the tertiary structure of protein formed?
vi. In what way are fats and oil different?
vii. What is Principle of Paper Chromatography?
viii. Why is TLC is not suitable for large-scale separation?
ix. What information does a chromatogram provide?
x. What is Planck's quantum theory?
xi. What is spectroscopy.



xii. Explain how the two isomers shown in diagram can be distinguished using IR spectroscopy.

Q. 4: Write short answers to any six (06) questions: (6×2=12)

i. State Two reason why TSM is standard H1 NMR

ii. Give Two Application in PVC and Nylon, each.
iii. Why does deuterium (D) not appear in NMR spectrum?
iv. Define energy density and give one example.
v. Name two specific semiconductors mentioned in the text and their modern applications.

vi. How structure of penicillin allows it to inhibit the transpeptidase enzyme?
vii. What is the concept of pesticide resistance in a target pest population, linking it to the principles of natural selection and repeated application?
viii. Name four methods used for water conservation.
ix. What is the role of "industrial discharge" in water pollution?

Subjective Type (Part II)

Note: Attempt any three questions. **8×3=24**

Q.5:

(a) Explain the process of extraction of Mg through Dow's Method (4)
(b) Describe the S_N1 and S_N2 mechanisms of nucleophilic substitution in halogenoalkanes. (4)

Q.6:

(a) Describe the splitting of d orbitals and color formation in octahedral and tetrahedral. (4)
(b) complexes?
(c) Illustrate the formation of two major condensation polymers. (4)

Q.7:

(a) In contrast to benzene, the reaction of an alkene with bromine does not need a halogen carrier. Compare the different reactivities of benzene and alkenes towards chlorine. (4)
(b) Explain how X-rays interact with crystals to produce diffraction patterns and how these patterns help determine atomic positions. (4)

Q.8:

(a) Explain acidity of phenol. (4)
(b) Describe the structure and mechanism of action of penicillin. (4)

Q.9:

(a) Explain the relative acidities of chlorine substituted carboxylic acids. (4)
(b) Explain the various technologies used in water treatment. (4)