

DESIGN OF THE SAMPLE QUESTION PAPER

Subject : Chemistry
Paper : Theory

Class : XII
Marks : 80

Duration : 3 hours.

1. Weightage by objectives

Objective	Marks	% age of the total marks
Knowledge	35	44
Understanding	29	36
Application	16	20
Skill		

2. Weightage by Types of Question

Type	Number of question	Total	Estimated Time a candidate is expected
Long answer question	3	$3 \times 4 = 12$	$3 \times 20 = 60$
Short answer question - I	7	$7 \times 3 = 21$	$7 \times 5 = 35$
Short answer questions- II	16	$16 \times 2 = 32$	$16 \times 3 = 48$
Very short answer questions	15	$15 \times 1 = 15$	$15 \times 1.5 = 23$
Total	41	80	166

3. Weightage by Content

Units/Sub-units (pl. specify)	Marks	Marks
Atoms, Molecules and Stoichiometry	7	
States of Matter	7	
Chemical Energetics	8	
Chemical Dynamics	7	
Structure of Atom and Chemical Bonding	11	
Elements and their compounds	15	
Chemistry of organic compounds	15	
OPTIONAL MODULE		
Agricultural Chemistry	10	
Bio Chemistry		
Environmental Chemistry		

4. Difficulty level of the question paper

Level	No.	%age of marks given
-Difficult (can be attempted by top students)	16	20
-Average (can be attempted by students who have regularly studied the materials but may not have given sufficient time to writing)	29	36
-Easy (can be attempted satisfactorily by students who have gone through the study materials)	35	44

13. Derive the SI units for the following quantities (2)
- Force
 - Pressure
14. 10g of a non-volatile solute in 100g of benzene raises its boiling point by 1K. What is the molecular mass of the solute? K_f for benzene = $2.53 \text{ K g}^{-1} \text{ mol}^{-1}$. (2)
15. Glucose is formed according to the following reaction :
 $6\text{CO}_2 (\text{g}) + 6\text{H}_2\text{O} (\text{l}) \rightarrow \text{C}_6\text{H}_{12}\text{O}_6 (\text{s}) + 6\text{O}_2 (\text{g})$
 absorbing 2840 kJ of heat. How much energy will be given out by combustion of 1.08 g of glucose? (2)
16. State Heisenberg's principle of uncertainty and give its mathematical relationship. (2)
17. The solubility of calcium sulphate in water is $4.9 \times 10^{-3} \text{ M}$ at 25°C . Calculate the value of K_{sp} for CaSO_4 at this temperature. (2)
 Given : $\text{CaSO}_4 (\text{s}) \rightleftharpoons \text{Ca}^{2+} (\text{aq}) + \text{SO}_4^{2-} (\text{aq})$
18. Explain the variation of ionization energy down the group in a periodic table. State the relationship of ionization energy of an atom with its reactivity. (2)
19. Paramagnetism of a substance can be calculated in terms of magnetic moment in Bohr Magnetism (BM) by using the expression :
 $\mu = n(n+2)^{1/2}$
 The atomic number of chromium is 24. In which oxidation state the magnetic moment of its (Chromium) ion will be maximum and in which it will be zero? (n is the number of unpaired electrons). (2)
20. Write briefly about 'Aldol condensation' and give an example. (2)
21. Differentiate between a gangue and slag. Give an example of a metallurgical step where slag, flux and gangue are involved simultaneously. (2)
22. Define the term isomerism. Give one example of each of the two types of isomerism. (2)
23. You are given three compounds A, B and C. A is $\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2\text{OH}$, B is
 $\text{CH}_3 - \underset{\text{OH}}{\text{CH}} - \text{CH}_2\text{CH}_3$ and C is
 $\text{CH}_3 - \underset{\text{OH}}{\overset{\text{CH}_3}{\text{C}}} - \text{OH}$.
 How will you distinguish between A, B and C if you are given conc HCl and anhydrous ZnCl_2 reagents only. Write the name of the test and the reactions involved. (2)

24. Normally each shell of an atom can accommodate a maximum of $2n^2$ number of electrons. Let us suppose the rule changes to $2n^3$. What shall be the configuration of element number 11 and what type of element it shall be as per allotment of its subshell ? (2)
25. Given the reaction :
 $\text{XeF}_4(\text{g}) + \text{F}(\text{g}) \rightarrow \text{XeF}_6(\text{g})$
 Predict the change in hybridization and consequent, final shape of the molecule followed in the above reaction. (2)
26. Write a chemical equation showing the oxidation of hydrogen sulphide with the help of acidified potassium dichromate. (2)
27. State the following laws and give the mathematical expression for each law :
 (i) Boyle's law
 (ii) Charles' law
 (iii) Dalton's law of partial pressures (3)
28. State the modern periodic law. Write the special names given to elements of group 1, 2, 17 and 18. (3)
29. (i) What is diazotization ? Explain giving an example.
 (ii) Describe the preparation of sulphanilic acid from aniline. Write its zwitter ionic structure. (3)
30. Molar mass of NaCl is 58.5 g mol^{-1} . Calculate the number of moles of Na^+ ions and Cl^- ions and also their masses in 11.7g of NaCl. (3)
31. A galvanic cell consists of metallic Zn plate immersed in 0.1 M $\text{Zn}(\text{NO}_3)_2$ solution and metallic plate of lead in 0.02 M $\text{Pb}(\text{NO}_3)_2$ solution. Given $E^\circ_{\text{Zn}^{2+}/\text{Zn}} = -0.76 \text{ V}$, $E^\circ_{\text{Pb}^{2+}/\text{Pb}} = -0.13 \text{ V}$
 a) Write the half-cell reactions
 b) Write the overall reaction of the cell
 c) Calculate the e.m.f. of the cell. (3)
32. Write one reaction each for the preparation of the following. Also write one use of each product.
 (i) Bleaching powder
 (ii) Caustic soda
 (iii) Quick lime (3)
33. (i) Which of the following acid is more acidic ? Explain giving reasons. CH_3COOH and $\text{Cl-CH}_2\text{COOH}$
 (ii) Explain why is the boiling point of an acid greater than the corresponding haloalkane. (4)

BLUE PRINT

Subject : Chemistry
Maximum Marks : 80

Class : Senior Secondary
Time : 3 hours

Sl. No	Form of Questions Content Unit	Knowledge				Understanding				Application				S k # /
		E	SA (I)	SA (II)	VSA	E	SA (I)	SA (II)	VSA	E	SA (I)	SA (II)	VSA	
1	ATOMS, MOLECULES AND STOICHIOMETRY			2(1) 13	1(1) 1				1(1) 2		3(1) 30			
2	STATES OF MATTER		3(1) 27		1(1) 3			2(1) 14	1(1) 4					
3	CHEMICAL ENERGETICS				2(2) 5,7	4(1) 34						2(1) 15		
4	CHEMICAL DYNAMICS				1(1) 8			2(1) 17	1(1) 6		3(1) 31			
5	STRUCTURE OF ATOMS AND CHEMICAL BONDING		3(1) 28	2(1) 16		4(1) 35						2(1) 25		
6	ELEMENTS AND THEIR COMPOUND		3(1) 32	2(1) 26	2(2) 9, 10			4(2) 18, 21				4(2) 19, 24		
7	CHEMISTRY OF ORGANIC COMPOUNDS		3(1) 29	4(2) 20, 22		4(1) 33			2(2) 11, 12			2(1) 23		
	OPTIONALS a) AGRICULTURAL CHEMISTRY b) BIOCHEMISTRY c) ENVIRONMENTAL CHEMISTRY		3(1)	2(1)	1(1)			2(1)	2(2)					
	SUB TOTAL		15(5)	12(6)	8(8)	12(3)		10(5)	7(7)		6(2)	10(5)		
	TOTAL													

Notes : Figures within brackets indicate the number of questions and figures outside the brackets indicate marks. The numbers given below the marks and number of questions gives the question number in the paper

Summary

Essay (E)	No.3	Marks : 12
Short-Answer (I) (SA(I))	No.7	Marks : 21
Short Answer (II) (SA(II))	No.16	Marks : 32
Very Short Answer (VSA)	No.15	Marks : 15

34. (i) What do you understand by entropy ? In what way is the total entropy change related to spontaneity of a system and to a system in equilibrium.
- (ii) Entropy change from liquid water to steam at 373K is $109\text{J mol}^{-1}\text{K}^{-1}$. What is the enthalpy change for the transition of liquid water to steam at 373 K. (4)
35. Valence shell electron pair repulsion theory can be used to predict the shapes of molecules. Using this theory :
- (i) explain the shapes acquired by BF_3 and CH_4
- (ii) explain why HOH bond angle in H_2O is slightly less than the tetrahedral angle 109.5 . (4)

Section B

PART I: OPTION 1 (Agricultural Chemistry)

1. Define composting. 1 mark
2. List two points of differences between micro nutrients and macro nutrients. 1 mark
3. What can be done to overcome the dangerous effects of modern agriculture? 1 mark
4. Why do we need biological nitrogen fixation? 2 marks
5. Define soil. List four major soil groups of India. 2 marks
6. Give the classification of pesticides based on target organisms. 3 marks

PART II : OPTION 2 (Bio Chemistry)

1. Give two examples of polysaccharides. 1 mark
2. Write two properties which are common to chemical catalysts and enzymes. 1 mark
3. List two differences between enzymes and catalysts. 1 mark
4. Define lipids. List 3 different types of lipids. 2 marks
5. Why are fats a better source of energy than glucose? 2 marks
6. List 3 functions of DNA. 3 marks

PART III : OPTION 3 (Environmental Chemistry)

1. Define water pollution. 1 mark
2. Why is chlorination not the most desirable method of disinfecting polluted water? 1 mark
3. What are the effects of detergents on fresh water bodies? 1 mark
4. What are anthropogenic pollutants? Give two examples each of primary and secondary pollutants. 2 marks
5. Why is it impossible for a nuclear reactor to blow up like a bomb? Explain. 2 marks
6. How is global warming caused? List four consequences of green house effect. 3 marks

SAMPLE QUESTION PAPER

CHEMISTRY

Time : 3 hrs.

Maximum Marks : 80

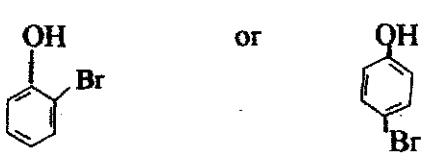
- Note : (i) All question in Section A are compulsory.
(ii) Attempt only one out of three options in Section B, i.e., attempt either Part I or Part II or Part III in Section B.
(iii) Marks for each question is indicated against it.
(iv) Use log tables if necessary.

Section A

1. What is the SI unit of mass ? (1)
2. How many moles of hydrogen gas are there in 11.2 litres of hydrogen gas at STP ? (1)
3. Name a lyophilic colloid. (1)
4. Why do the molecular solids have low melting points ? (1)
5. Define enthalpy of formation. (1)
6. Why is lithium most difficult to be reduced ? (1)
7. Define an isolated system. (1)
8. What is Le Chatelier's principle. (1)
9. Name the components of Bordeaux mixture. (1)
10. State two characteristics properties of transition elements which are different from group 1 elements. (1)
11. Give the structural formula of the product obtained on mono bromination of phenol. (1)
12. Write IUPAC name of the following compound. (1)
$$\begin{array}{c} \text{CH}_3 \text{ CH} - \text{CH}_2\text{COCH}_3 \\ | \\ \text{CH}_3 \end{array}$$

MARKING SCHEME

CHEMISTRY

Q.No.	Expected value points for each step	Distribution of marks
1.	Kilogram or kg	1 mark
2.	0.5 mol	1 mark
3.	Gum, gelatin or starch (any one) or any other suitable example.	1 mark
4.	Due to weak building forces	1 mark
5.	Correct definition	1 mark
6.	Because the reduction potential of lithium is minimum or its oxidation potential is maximum.	1 mark
7.	Correct definition	1 mark
8.	Correct statement	1 mark
9.	$\text{CuSO}_4(\text{aq}) + \text{CaO}$	1 mark
10. i)	Variable oxidation state	½ mark
ii)	Forms coloured ions	½ mark
	Or any two correct differences	
11.		1 mark
12.	4 - methyl - 2- pentanone	1 mark
13. (i)	Force = mass x acceleration = $\text{kg} \cdot \text{ms}^{-2}$ or N	½ mark
(ii)	Pressure = $\frac{\text{Force}}{\text{Area}} = \frac{\text{N}}{\text{m}^2} = \text{Nm}^{-2}$ or $\text{kg m}^{-1} \text{s}^{-2}$	½ mark

$$14. M_B = K_f \frac{W_B}{W_A} \times \frac{1000}{T} \quad \frac{1}{2} \text{ mark}$$

$$M_B = (2.53 \text{ kg mol}^{-1}) \cdot \frac{10\text{g}}{100\text{g}} \times \frac{1000}{1\text{K}} \quad 1 \text{ mark}$$

$$= 253 \text{ g mol}^{-1} \quad \frac{1}{2} \text{ mark}$$

(Correct result with correct unit)

15. Correct value for enthalpy of combustion of glucose by reversing the reaction

$$= -2840 \text{ kJ} \quad \frac{1}{2} \text{ mark}$$

$$\text{No. of moles of glucose} = \frac{1.08}{180}$$

$$\text{Now the heat evolved by the combustion of 1 mol (180g) of glucose} = 2840 \text{ kJ} \quad \frac{1}{2} \text{ mark}$$

$$\therefore \text{By the combustion of 1.08g of glucose the energy given out} = 2840 \text{ kJ} \times \frac{1.08\text{g}}{180\text{g}} \quad \frac{1}{2} \text{ mark}$$

$$= 17.04 \text{ kJ} \quad \frac{1}{2} \text{ mark}$$

16. Correct statement of uncertainty principle 1 mark

$$\Delta x \cdot \Delta p \geq \frac{h}{4\pi} \quad 1 \text{ mark}$$

17. For the reaction $K_{sp} = [\text{Ca}^{2+}] [\text{SO}_4^{2-}]$. 1/2 mark

From the equation we see that when 4.9×10^{-3} mol of CaSO_4 dissolves to make 1L of a saturated solution, the reacting ionic concentration are

$$[\text{Ca}^{2+}] = 4.9 \times 10^{-3} \text{ M or } 4.9 \times 10^{-3} \text{ mol L}^{-1} \quad \frac{1}{2} \text{ mark}$$

$$[\text{SO}_4^{2-}] = 4.9 \times 10^{-3} \text{ M or } 4.9 \times 10^{-3} \text{ mol L}^{-1} \quad \frac{1}{2} \text{ mark}$$

$$K_{sp} = [\text{Ca}^{2+}] [\text{SO}_4^{2-}] = (4.9 \times 10^{-3} \text{ mol L}^{-1}) \times (4.9 \times 10^{-3} \text{ mol L}^{-1})$$

$$= 2.4 \times 10^{-5} \text{ mol}^2 \text{ L}^{-2} \quad \frac{1}{2} \text{ mark}$$

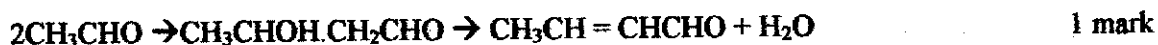
18. Ionization energy decreases down the group due to looseness of outermost electrons. 1 mark

Lesser ionization energy, more reactivity. 1 mark

19. Magnetic moment will be maximum in Cr^{2+} 1 mark

Magnetic moment will be zero in Cr^{6+} 1 mark

20. Aldol condensation is the condensation of aldehydes and/or ketones possessing at least one H-atom attached to α - carbon atom in the presence of an alkali. 1 mark



21. Slag is a fusible substance formed by the reaction of flux with the impurity (gangue). 1 mark



22. Definition of isomerism $\frac{1}{2}$ mark

Three types of isomerisms with examples $\frac{1}{2} + \frac{1}{2} + \frac{1}{2}$

23. Correct equations of the test (Lucas Test) $1\frac{1}{2}$ mark

Name of the test (Lucas Test) $\frac{1}{2}$ mark

24. $1s^2 2s^2 2p^6 2d^1$ 1 mark

transition element 1 mark

25. sp^3 hybrid gives d^2sp^3 1 mark

Changes from tetrahedral to octahedral 1 mark

26. $\text{K}_2\text{Cr}_2\text{O}_7 + \text{H}_2\text{SO}_4 + \text{H}_2\text{S} \rightarrow \text{K}_2\text{SO}_4 + \text{Cr}_2(\text{SO}_4)_3 + \text{H}_2\text{O} + \text{SO}_2$ 2 mark

27. Correct statement of each law + correct mathematical expression for each law $(\frac{1}{2} + \frac{1}{2}) \times 3$

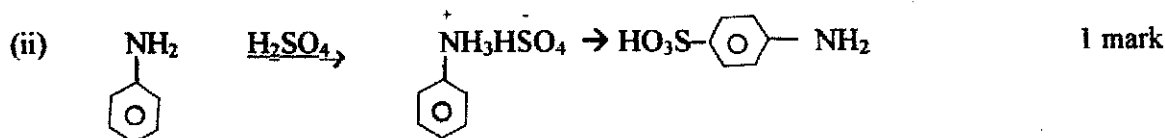
28. Correct statement of modern periodic law. 1 mark

Group 1 = alkali Group 2 = alkaline $\frac{1}{2} \times 4$

Group 17 = halogens Group 18 = noble gases

29. (i) Correct description of diazotization $\frac{1}{2}$ mark

example $\frac{1}{2}$ mark



Zwitter ion



157

½ mark

$$30. \text{ No. of moles of NaCl} = \frac{11.7\text{g}}{58.5\text{g mol}^{-1}} = 0.2 \text{ mol}$$

1 mark

$$\text{Correct No. of moles of Na}^+ = \frac{11.7\text{g}}{58.5\text{g mol}^{-1}} = 0.2 \text{ mol}$$

½ mark

$$\text{Correct No. of moles of Cl}^- = \frac{11.7\text{g}}{58.5\text{g mol}^{-1}} = 0.2 \text{ mol}$$

½ mark

$$\text{Mass of Na}^+ \text{ ion} = \frac{11.7\text{g}}{58.5\text{g mol}^{-1}} \times 23 = 4.6 \text{ g}$$

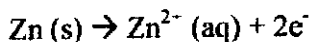
½ mark

$$\text{Mass of Cl}^- \text{ ion} = \frac{11.7\text{g}}{58.5\text{g mol}^{-1}} \times 35.5 = 7.1 \text{ g}$$

½ mark

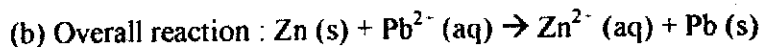
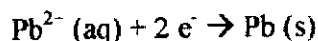
31. (a) At anode

½ mark



At cathode

½ mark



½ mark

$$(c) E^{\circ} \text{ cell} = E^{\circ} \text{ cathode} - E^{\circ} \text{ anode} = -0.13\text{V} - (-0.76\text{V}) = 0.63\text{V}$$

½ mark

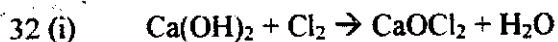
$$\text{Nernst eqn for the cell } E_{\text{cell}} = E^{\circ} \text{ cell} - \frac{0.0591}{n} \log \frac{[\text{Zn}^{2+}]}{[\text{Pb}^{2+}]}$$

½ mark

$$= 0.63 \text{ V} - \frac{0.0591}{2} \log \frac{[0.1\text{M}]}{[0.02\text{M}]} = 0.63 \text{ V} - 0.0295 \log 5$$

½ mark

$$= 0.6094 \text{ V}$$



½ mark

as bleaching agent.

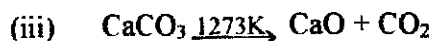
½ mark



½ mark

Used in manufacture of soap, paper, artificial silk (any one)

½ mark



½ mark

It is used in manufacture of bleaching powder and glass; used in tanning industry; for purification of sugar; used in cement industry. (any one)

½ mark

33. (i) ClCH_2COOH is a stronger acid

½ mark

Discussion on electron donating effect of $-\text{CH}_3$ group (+I effect) and electron attracting effect of $-\text{Cl}$ group (-I effect).

1½ mark

(ii) Correct explanation giving dimer structure of an acid $\text{R}-\text{C} \begin{array}{l} \text{O} \cdots \text{H} \cdots \text{O} \\ \text{O} \cdots \text{H} \cdots \text{O} \end{array} \text{C}-\text{R}$

2 marks

34. (i) Definition of entropy in terms of randomness.

1 mark

(Spontaneous) Irreversible : $\Delta S_{\text{total}} > 0$

½ mark

(Equilibrium) Reversible : $\Delta S_{\text{total}} = 0$

½ mark

(ii) $\text{H}_2\text{O} (\text{l}, 373\text{K}) \rightleftharpoons \text{H}_2\text{O} (\text{g}, 373\text{K})$

$$S_{\text{vap}} = \frac{\Delta H}{T} \text{ or } 109 \text{ J mol}^{-1} \text{ K}^{-1} = \frac{\Delta H}{373\text{K}}$$

1+½ mark

$$\text{Or } \Delta H = 109 \text{ J mol}^{-1} \text{ K}^{-1} \times 373\text{K} = 40.8\text{kJ mol}^{-1}$$

½ mark

(½ mark for correct result with unit)

35. (i) BF_3 – triangular + explanation

½+ ½ mark

CH_4 – tetrahedral + explanation

½+ ½ mark

(ii) The oxygen atom in H_2O has two bond pairs and two lone pairs. Therefore, two of the four vertices of a tetrahedron are occupied by lone pairs. Because of the lone pair bond pair repulsion, the bond angle in H_2O is slightly less than 109.5° .

2 marks

SECTION B

149

PART I : OPTION 1 (Agricultural Chemistry)

1. Composting is a biological process in which micro organisms decompose organic matter in the presence/absence of oxygen, and lower the carbon nitrogen ratios of refuse. 1 mark
2. Any two points of differences. $\frac{1}{2} + \frac{1}{2}$ marks
3. Cheapest and permanent solution to overcome the dangerous effects of modern agriculture is to do sustainable farming or organic farming or natural farming. 1 mark
4. In our country there is a big gap between consumption and production of nitrogenous fertilizers. Hence we have to import fertilizers. Under such circumstances the biological nitrogen fixation provides the answer to meet the nitrogen requirement of leguminous and pulse crops. 2 marks
5. Correct definition of soil. 1 mark
Four major soil groups of India are : Alluvial soil, black soil, red soil and laterite soil.
 $\frac{1}{4} \times 4 = 1$ mark
6. Correct classification. 3 marks

PART II : OPTION 2 (Biochemistry)

1. Starch, cellulose and glycogen (any two) $\frac{1}{2} \times 2 = 1$ mark
2. Any two properties like both are not consumed during course of reaction, they do not cause reaction to take place or any other property. $\frac{1}{2} \times 2 = 1$ mark
3. Any two differences like enzymes exhibit high specificity where as catalyst are more general and can act on various similar substrate; the rate of an enzymatic reaction is proportional to the amount of enzyme where as this is not so with catalyst or any

other difference.

$\frac{1}{2} \times 2 = 1$ mark

4. Correct definition of lipids

$\frac{1}{2}$ mark

Three different types of lipids are : simple lipids, compound lipids and derived lipids.

$\frac{1}{2} \times 3 = 1\frac{1}{2}$ mark

5. Because the energy released by the oxidation of one molecule of fatty acid is far more higher (at least twice) than that released by oxidation of glucose.

2 marks

6. Any three functions.

$1 \times 3 = 3$ marks

PART III : OPTION 3 (Environmental Chemistry)

1. Water pollution is any physical, chemical or biological change in a water body that has an undesirable effect on living organisms.

1 mark

2. Because chlorine reacts with organic matter to produce highly toxic chlorinated hydrocarbon which can cause cancer.

1 mark

3. Detergents contain phosphates which promote algal growth in a water body leading to eutrophication.

1 mark

4. Pollutants added to the environment through human activities are termed anthropogenic pollutants.

1 mark

Examples of primary pollutants : CO_2 , CO from burning of fuel, SO_2 and oxides of nitrogen from vehicular combustion and thermal power station (any two)

$\frac{1}{4} \times 2 = \frac{1}{2}$ mark

Examples of secondary pollutants: SO_3 , H_2SO_4 , NO_2 (any two)

$\frac{1}{4} \times 2 = \frac{1}{2}$ mark

5. The nuclear fuel that is used in a reactor contains a low concentration of fissionable U-235 (only 3%). Since the critical mass required for a self sustaining fission reaction is not available, the probability of nuclei hitting fissionable nuclei is low. Thus the reaction continues in a slow fashion. Also coolants are used to slow down the reaction.

2 marks

6. If proportion of green house gases increase in the atmosphere, heat trapped by them will raise the temperature of the earth causing global warming.

Consequences of green house effect:

1. Rise in sea level
 2. Drought
 3. Reduced plant growth
 4. Encourage growth of pests
 5. Water shortage.
- (any four)

$\frac{1}{2} \times 4 = 2$ marks

ERRATA

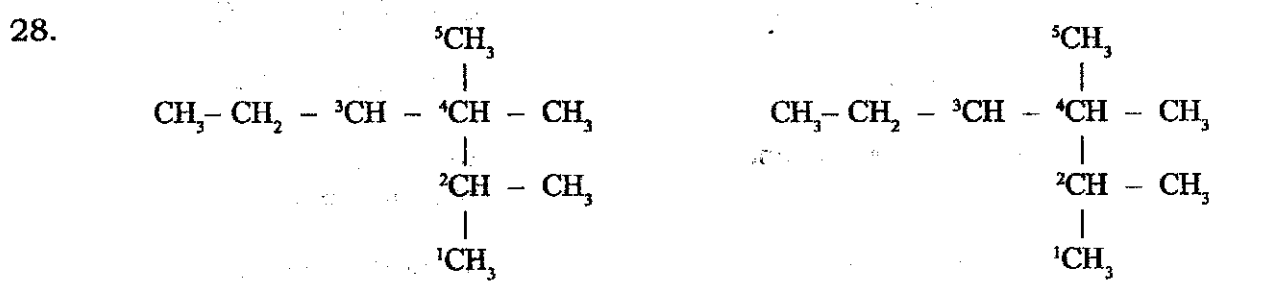
Book 2

Page No.	Printed As	May be read as
2.	2 - Buten - 1 - ol $\text{CH}_3 - \text{CH}_2 - \text{CH}_2 = \text{CH}_2$ $\text{CH}_3 - \text{CH} - \text{C} \equiv \text{CH}$	Propanoic acid $\text{CH}_3 - \text{CH}_2 - \text{CH} = \text{CH}_2$ $\text{CH}_3 - \text{CH}_2 - \text{C} \equiv \text{CH}$
	2 - Butenol	But - 2 - en - 1 - ol
3.	characteristic 'aroma' or smell	some special characteristics
4.	to $> \text{C} = \text{C} <$ bond mechanism steps, process	To be deleted sequence of steps
5.	It is nucleus seeking	To be deleted
6.	$\text{R}' \equiv \text{C} \equiv \text{C} - \text{R}$	$\text{R}' - \text{C} \equiv \text{C} - \text{R}$
7.	SN^2 or SN^1	To be deleted
11.	acids	Carboxylic acids
12.	- onyl chloride	- nyl chloride
13.	2 - Methyl - 1 - chloropropane	1 - chloro - 2 - methyl propane
14.	$\begin{array}{ccccccc} & \text{H} & & \text{H} & & \text{H} & \\ & & & & & & \\ \text{H} & - \text{C} & - & \text{C} & - & \text{C} & - \text{H} \\ & & & & & & \\ & \text{H} & & \text{C} & & \text{H} & \\ & & & & & & \\ & & & \text{H} & & & \end{array}$	$\begin{array}{ccccccc} & \text{H} & & \text{H} & & \text{H} & \\ & & & & & & \\ \text{H} & - \text{C} & - & \text{C} & - & \text{C} & - \text{H} \\ & & & & & & \\ & \text{H} & & & & \text{H} & \\ & & & & & & \\ & & & \text{H} & & & \end{array}$
15.	Propanol Chlorobutane around the double bond	1 - Propanol 1 - Chlorobutane to be deleted



22. 2 - methyl - 1 - chloropropane 1 - chloro - 2 - methylpropane

25. Hexagonal to be deleted



30. 2, 3 - Dimethyl cyclohexane 2, 3 - Dimethylcyclohex - 1 - en

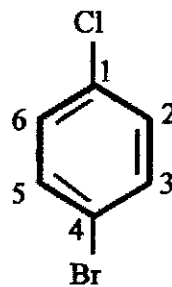
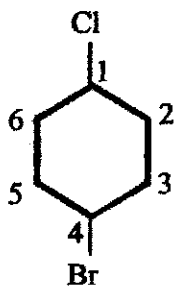
39. Alkanes Alkenes
 symmetrical substituted



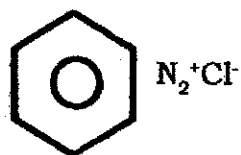
70. see - propyl bromide

iso - propyl bromide

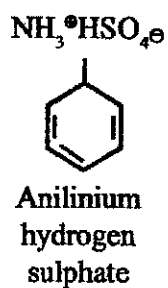
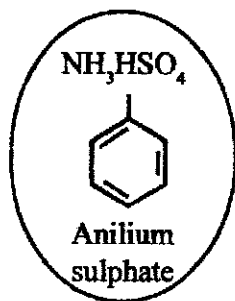
71.



91.



123.



129.

