

MODEL PAPER “CHEMISTRY”
Intermediate Part-II Examination, 2008 & Onward

Roll No. _____
In Figures _____
In Words _____

OBJECTIVE

Time: 20 Minutes

Marks: 17

Note: Write your Roll No. in space provided. Over-writing, Cutting, Erasing, Using lead pencil will result in loss of marks.

Q.No.7. Each question has four possible answers. Choose the correct answer and encircle it. 17

- (i) Mark the correct statement:
(a) Covalent character of metal halides increases from left to right in a period.
(b) Boiling points of group IV-A hydrides decrease down the group.
(c) Ionic character of hydrides increase from left to right in a period.
(d) The basicities of group II-A oxides decrease on descending the group.
- (ii) Alkali metals are chemically similar because:
(a) their atomicity is one
(b) their outermost electrons have the same principal quantum number.
(c) their valence shell electronic configuration is same.
(d) their valence shell electrons are equally energetic.
- (iii) The chief ore of aluminum is:
(a) Na_3AlF_6 (b) $\text{Al}_2\text{O}_3 \cdot 2\text{H}_2\text{O}$ (c) Al_2O_3 (d) $\text{Al}_2\text{O}_3 \cdot \text{H}_2\text{O}$
- (iv) H_2SO_4 has great affinity for water because:
(a) it decomposes the acid (b) it hydrolyses the acid
(c) acid decomposes water (d) acid forms hydrate with water
- (v) Point out the correct statement about halogens :
(a) They can mutually displace each other from the solution of their compounds with metals
(b) They are all capable of showing several oxidation states
(c) They are all diatomic and form divalent ions
(d) They are diatomic and form univalent ions
- (vi) The colour of transition metal complexes is due to:
(a) d-d transitions of electrons
(b) paramagnetic nature of transition elements:
(c) ionization (d) loss of s-electrons
- (vii) Geometrical isomerism in alkenes is due to:
(a) oscillation of H-atoms between two polyvalent carbon atoms
(b) optical rotation due to multiple bond
(c) free rotation about C = C bond
(d) restricted rotation about C = C bond
- (viii) When an unsymmetrical olefin like $(\text{CH}_3)_2\text{CHCH} = \text{CH}_2$ is hydrated with dil. H_2SO_4 the major product is:
(a) 3- Methyl -1-butanol (b) 1-Methyl 2-butanol
(c) 3- Methyl-2-butanol (d) 2- Methyl 2-butanol

- (ix) Aromatic compounds burn with sooty flame because:
- they have high percentage of hydrogen
 - they have a ring structure
 - they have high percentage of carbon
 - they resist reaction with air
- (x) Alkyl halides are considered to be very reactive compounds towards nucleophiles, because:
- they have an electrophilic carbon
 - they have an electrophilic carbon and a good leaving group
 - they have an electrophilic carbon and a bad leaving group
 - they have a nucleophilic carbon and a good leaving group
- (xi) What is the name of the reaction when $\text{C}_2\text{H}_5\text{ONa} + \text{C}_2\text{H}_5\text{I}$ gives an ether.
- Hofmann's reaction
 - Williamson's reaction
 - Kolbe's synthesis
 - Wurtz's reaction
- (xii) Tollen's reagent is:
- alkaline solution containing potassium tartrate
 - alkaline solution containing potassium citrate
 - ammonical AgNO_3
 - ammonical Cu_2Cl_2
- (xiii) Organic compounds X and Y react together to form organic compound Z. what types of compounds can X, Y and Z be?
- | X | Y | Z |
|-------------|---------|---------|
| (a) alcohol | ester | acid |
| (b) acid | ester | alcohol |
| (c) ester | alcohol | acid |
| (d) alcohol | acid | ester |
- (xiv) Vegetable oils are:
- unsaturated fatty acids
 - glycerides of unsaturated fatty acids
 - glycerides of saturated fatty acids
 - essential oils obtained from plants
- (xv) Which sequence of steps is correct for the manufacture of cement:
- Mixing, heating, grinding, crushing
 - Crushing, heating, mixing, grinding
 - Crushing, mixing, heating, grinding
 - Crushing, grinding, mixing, heating
- (xvi) One of the following is not the affect of acid rain. Point out that:
- It increases the percentage of CO_2 in the atmosphere
 - It leaches metals like aluminum, mercury and lead from soil
 - It damages the buildings
 - It decreases the **pH** of natural rain
- (xvii) Write down the formulae of the:
- Asbestos
 - Phosphrite
 - Tincal
 - Potassium hexachloroplatinate(IV)

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SUBJECTIVE

Time: 2:40Hours

Marks: 68

Note: - Attempt any TWENTY TWO (22) questions from Section -I and any THREE questions form Section-II

SECTION -I

Q.No.1. Attempt any TWENTY TWO (22) questions.

(22x2)=44

- (i) The melting and boiling points of the elements increase from left to the right upto the middle of s- block elements and decrease onwards. Why?
- (ii) The hydration energies of the ions are in the following order.
$$\text{Al}^{3+} > \text{Mg}^{2+} > \text{Na}^{+}$$
- (iii) Give reason How magnesium and calcium react with nitrogen to give nitrides which on hydrolysis give ammonia?
- (iv) What do you mean by dead burnt gypsum?
- (v) Why the aqueous solution of Na_2CO_3 is alkaline in nature?
- (vi) Which basic radicals give the response to borax bead test?
- (vii) What is the effect of temperature on semiconductors?
- (viii) How does HNO_2 act as a reducing agent?
- (ix) P_2O_5 is a powerful dehydrating agent. Give one example.
- (x) Why SO_3 gas is dissolved in H_2SO_4 , but not in water in contact process?
- (xi) What do you mean by available chlorine and how is it calculated?
- (xii) Why HF is a weaker acid than HCl ?
- (xiii) Why the maximum paramagnetic strength is associated with the middle elements of d-block series?
- (xiv) How does the metallic coating prevent the corrosion?
- (xv) Write the equation of chromyl chloride test for KCl .
- (xvi) Give four examples of aromatic heterocyclic compounds.
- (xvii) How do you convert alkynes into cis and trans alkenes?
- (xviii) How Baeyer's test is employed to check the presence of carbon-carbon double bond?
- (xix) Write down the resonance structures of benzene and indicate their relative contributions towards the actual structure of benzene:
- (xx) How does ozone affect benzene to give glyoxal?
- (xxi) Give the general pattern of the reaction of SN_2 - mechanism and its rate expression.
- (xxii) Show the mechanism for the reaction of acetone with Grignard's reagent:
- (xxiii) Ethanol gives different products with conc. H_2SO_4 under different conditions. Justify it.

- (xxiv) How the resonance structures of phenoxide ion make phenol acidic?
- (xxv) How acids and bases acting as catalysts increase the reactivity of aldehydes and ketones?
- (xxvi) How aldehydes react with alcohols to give hemiacetals and acetals?
- (xxvii) Write the structures of dimers of carboxylic acids?
- (xxviii) How do you justify the cyclic structure of glucose from its open chain structure?
- (xxix) Give the idea of saponification number.
- (xxx) Mention the importance of potassium fertilizers.
- (xxxi) Name commonly use bleaching agents in paper manufacture?
- (xxxii) How **COD** is measured?
- (xxxiii) Mention the side effects of incineration.

SECTION -II

Note: - Attempt any THREE questions.

- Q.No2.** (a) Compare the chemical behaviour of lithium with magnesium. 3
- (b) Write notes on the followings: 3
- (a) Oxyfluorides of xenon. (b) Applications of noble gases.
- (c) Complete and balance the following chemical equations. 2
- (i) $P + NO_2 \longrightarrow$
- (ii) $NO_2 + H_2SO_4 \longrightarrow$
- (iii) $HNO_2 + NH_3 \longrightarrow$
- (iv) $KNO_3 + H_2SO_4 \longrightarrow$
- Q.No3.** (a) How does the electronic configuration of valence shell affect the following properties of the transition elements? 3
- (a) Binding energy (b) Paramagnetism (c) Melting points
- (b) Discuss the wet process for the manufacturing of cement with the help of flow sheet diagram. 3
- (c) What are nucleic acids? Write down the role of **DNA** and **RNA** in life. 2
- Q.No4.** (a) What do you understand by the term β -elimination reaction? Explain briefly the two possible mechanisms of β -elimination reactions. 3
- (b) Explain the type of bonds and shapes of the following molecules using hybridization approach. 3
- $CH_2 = CH_2$, $CH = CH$, $HCHO$**
- (c) Compare the reactions of phenol with that of ethanol. Discuss the difference if any. 2
- Q.No5.** (a) Starting from ethane, outline the reactions for the preparation of following compounds. 3
- (a) Ethylene dibromide (b) Ethyne
- (c) Formaldehyde
- (b) How does propyne react with the following reagents? 3
- (a) $AgNO_3/NH_4OH$ (b) Cu_2Cl_2/NH_4OH
- (c) $H_2O/H_2SO_4, HgSO_4$
- (c) What are α -amino acids, proteins and peptides? How are they related? 2
- Q.No6.** (a) Give the mechanisms of following reactions: 3
- (a) Kolbe's electrosynthesis (b) Nitration of benzene
- (c) Reaction of acetone with Gingiard's reagent.
- (b) Discuss oxidation of (a) aldehydes (b) ketones with: 3
- (a) $K_2Cr_2O_7/H_2SO_4$ (b) Tollen's reagent (c) Fehling's solution
- (c) How detergents are threat to aquatic animal life? 2