

Note: You have four choices for each objective type question as A, B, C and D. The choice which you think is correct, fill that bubble in front of that question number, on bubble sheet. Use marker or pen to fill the bubbles. Cutting or filling two or more bubbles will result in zero mark in that question. No credit will be awarded in case BUBBLES are not filled. Do not solve question on this sheet of OBJECTIVE PAPER.

Q.No.1

- (1) Which one of the following does not belong to alkaline earth metals?
 (A) *Be* (B) *Ra* (C) *Ba* (D) *Rn*
- (2) Which element forms an ion with charge +3?
 (A) *Be* (B) *Al* (C) *C* (D) *Si*
- (3) Oxidation of *NO* in air produces:
 (A) *N₂O* (B) *N₂O₃* (C) *N₂O₄* (D) *N₂O₅*
- (4) Chlorine heptaoxide (*Cl₂O₇*) reacts with water to form:
 (A) Hypochlorous acid (B) Chloric acid (C) Perchloric acid (D) Chlorine and oxygen
- (5) The anhydride of *HClO₄* is:
 (A) *ClO₃* (B) *ClO₂* (C) *Cl₂O₅* (D) *Cl₂O₇*
- (6) Which of the following is a non-typical transition element?
 (A) *Cr* (B) *Mn* (C) *Zn* (D) *Fe*
- (7) Ethers show the phenomenon of:
 (A) Position isomerism (B) Functional group isomerism (C) Metamerism (D) Cis-trans isomerism
- (8) Preparation of vegetable ghee involves:
 (A) Halogenation (B) Hydrogenation (C) Hydroxylation (D) Dehydrogenation
- (9) Which of the following acid can be used as a catalyst in Friedal-Crafts reactions?
 (A) *AlCl₃* (B) *HNO₃* (C) *BeCl₂* (D) *NaCl*
- (10) For which mechanisms, the first step involved is the same?
 (A) *E₁* and *E₂* (B) *E₂* and *S_N2* (C) *S_N1* and *E₂* (D) *E₁* and *S_N1*
- (11) Which compound is more soluble in water?
 (A) *C₂H₅OH* (B) *C₆H₅OH* (C) *CH₃COCH₃* (D) *n* - Hexanol
- (12) Which of the following will have the highest boiling point?
 (A) Methanal (B) Ethanal (C) Propanal (D) 2 - Hexanone
- (13) Which of the following reagents will react with both aldehydes and ketones?
 (A) Grignard's reagent (B) Tollen's reagent (C) Fehling's reagent (D) Benedict's reagent
- (14) Which reagent is used to reduce a carboxylic group to an alcohol?
 (A) $\frac{H_2}{Ni}$ (B) $\frac{H_2}{Pt}$ (C) *NaBH₄* (D) *LiAlH₄*
- (15) Alkanenitriles can be prepared by treating alkyl halide with:
 (A) Alcoholic *KOH* (B) Alcoholic *KCN* (C) Aqueous *KOH* (D) Aqueous *KNO₃*
- (16) Most concentrated solid nitrogen fertilizer is:
 (A) *NH₃* (B) *(NH₄)₂HPO₄* (C) *(NH₂)₂CO* (D) *NH₄NO₃*
- (17) Mark the correct statement.
 (A) *Na⁺* is smaller than *Na* atom (B) *Na⁺* is larger than *Na* atom
 (C) *Cl⁻* is smaller than *Cl* atom (D) *Cl⁻* ion and *Cl* atom are equal in size

NOTE: Write same question number and its part number on answer book,
as given in the question paper.

SECTION-I

2. **Attempt any eight parts.** $8 \times 2 = 16$
- (i) The first electron affinity of oxygen is negative but the second is positive. Justify it.
 - (ii) Why diamond is bad conductor of electricity but graphite is fairly good conductor of electricity?
 - (iii) What is the significance of KO_2 for mountaineers?
 - (iv) Why is the aqueous solution of Na_2CO_3 is alkaline in nature?
 - (v) How boric acid can be prepared on commercial scale?
 - (vi) Give the names and formulas of different acids of boron.
 - (vii) How does Aluminium react with the following (a) Cl_2 (b) H_2
 - (viii) H_2SO_4 acts as dehydrating agent. Justify giving two reactions.
 - (ix) Complete and balance the following chemical equations:
(a) $KNO_3 + H_2SO_4 \longrightarrow ?$ (b) $NO + Cl_2 \longrightarrow ?$
 - (x) What are macronutrients? Give examples.
 - (xi) Give essential qualities of good fertilizers.
 - (xii) Write the reactions involved in preparation of urea fertilizer.
3. **Attempt any eight parts.** $8 \times 2 = 16$
- (i) Write down the factors on which oxidizing power of halogens depends.
 - (ii) How are HF and HCl prepared?
 - (iii) Complete the following reactions:
(a) $HIO_3 \xrightarrow{240^\circ C}$ (b) $HgO + Br_2 \xrightarrow{50^\circ C}$
 - (iv) Why transition elements have variable oxidation state?
 - (v) What is anode coating?
 - (vi) Write names and formulas of two fused ring hydrocarbons.
 - (vii) Convert benzene into (a) Toluene (b) Cyclohexane
 - (viii) Convert ethene into ethanal.
 - (ix) Distinguish between ethanal and propanone by two chemical tests.
 - (x) Draw formulae for Malonic acid and Phthalic acid.
 - (xi) Write names of esters for Banana and Orange flavours.
 - (xii) What is glacial acetic acid?
4. **Attempt any six parts.** $6 \times 2 = 12$
- (i) Give the importance of catalytic cracking.
 - (ii) What is octane number? How can it be improved?
 - (iii) Give the reaction of Methane with nitric acid.
 - (iv) Discuss the reactivity of Pi-bond.
 - (v) Explain the acidic behaviour of acetylene.
 - (vi) Prepare *n*-butane by Wurtz Synthesis.
 - (vii) Give the reaction of Alcohol with $SOCl_2$.
 - (viii) Prepare phenol by Dow's Method.
 - (ix) How iodoform reaction helps to distinguish between Methanol and ethanol?

SECTION-II

- NOTE:** **Attempt any three questions.** $8 \times 3 = 24$
- 5.(a) Give the differences of Hydrogen with group IA, IVA and VIIA elements in the periodic table. 4
(b) Describe the process for the preparation of Sodium Hydroxide on commercial scale. 4
 - 6.(a) Give manufacture of Nitric acid with diagram by Birkeland and Eyde's process. 4
(b) What is Corrosion? Explain Electrochemical theory of Corrosion. 4
 - 7.(a) Define Atomic Orbital Hybridization. Explain sp^3 Hybridization. 4
(b) Write equations for the reactions of acetaldehyde with: 4
(i) $NaHSO_3$ (ii) $NH_2 - OH$ (iii) $C_2H_5 - OH$ (iv) $NH_2 - NH - C_6H_5$
 - 8.(a) Write down four methods for the preparation of alkenes. 4
(b) What are Nucleophilic substitution reactions? Explain S_N2 mechanism. 4
 - 9.(a) Discuss sulphonation and nitration of Benzene with mechanism. 4
(b) Discuss industrial preparation of methanol. 4