

OBJECTIVE

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 circle in front of that question number. Use marker or pen to fill the circles. Cutting or filling two or more circles will result in zero mark in that question.

**QUESTION NO. 1**

- 1 Mark the correct statement  
(A) The ionization energy of calcium is lower than that of barium  
(B) The ionization energy of calcium is lower than that of magnesium  
(C) The ionization energy of calcium is higher than that of beryllium  
(D) The ionization energy of calcium is lower than that of strontium
- 2 Which of the following sulphates is not soluble in water?  
(A) Sodium sulphate (B) Potassium sulphate (C) Barium sulphate (D) Zinc sulphate
- 3 Boric acid cannot be used  
(A) As antiseptic in medicine (B) For washing eyes (C) In soda bottles (D) For enamels and glazes
- 4 Which catalyst is used in contact process?  
(A)  $\text{Fe}_2\text{O}_3$  (B)  $\text{V}_2\text{O}_5$  (C)  $\text{SO}_3$  (D)  $\text{Ag}_2\text{O}$
- 5 The anhydride of  $\text{HClO}_4$  is  
(A)  $\text{ClO}_3$  (B)  $\text{ClO}_2$  (C)  $\text{Cl}_2\text{O}_7$  (D)  $\text{Cl}_2\text{O}_5$
- 6 Which of the following represents the correct electronic configuration of the outer most energy level of an element of (VIIA) in the ground state?  
(A)  $\text{S}^2\text{P}^2$  (B)  $\text{S}^2\text{P}^4$  (C)  $\text{S}^2\text{P}^5$  (D)  $\text{S}^2\text{P}^6$
- 7 Group VIB of the transition elements contains  
(A) Zn, Cd, Hg (B) Fe, Ru, Os (C) Cr, Mo, W (D) Mn, Te, Re
- 8 Ethers show the phenomenon of  
(A) Position isomerism (B) Functional group isomerism (C) Metamerism (D) Cis-Trans isomerism
- 9 The addition of unsymmetrical reagent to an unsymmetric alkene follows the rule  
(A) Hund's Rule (B) Pauli's Exclusion principle (C) Markownikoff's Rule (D) Aufbau Principle
- 10 The electrophile in aromatic sulphonation is  
(A)  $\text{H}_2\text{SO}_4$  (B)  $\text{HSO}_4$  (C)  $\text{SO}_3^+$  (D)  $\text{SO}_3$
- 11 Which one of the following is not a nucleophile?  
(A)  $\text{H}_2\text{O}$  (B)  $\text{H}_2\text{S}$  (C)  $\text{NH}_3$  (D)  $\text{BF}_3$
- 12 Which compound shows hydrogen bonding?  
(A)  $\text{C}_2\text{H}_6$  (B)  $\text{C}_2\text{H}_5\text{Cl}$  (C)  $\text{CH}_3\text{-O-CH}_3$  (D)  $\text{CH}_3\text{CH}_2\text{-OH}$
- 13 Formalin is  
(A) 60 % solution of formaldehyde in water (B) 10 % solution of formaldehyde in water  
(C) 20 % solution of formaldehyde in water (D) 40 % solution of formaldehyde in water
- 14 The carbon atom of a carbonyl group is  
(A)  $\text{sp}$ -hybridized (B)  $\text{sp}^2$ -hybridized (C)  $\text{sp}^3$ -hybridized (D)  $\text{dsp}^3$ -hybridized
- 15 Acetic acid is manufactured by  
(A) Distillation (B) Fermentation (C) Ozonolysis (D) Esterification
- 16 Which acid is used in the manufacture of synthetic fibre?  
(A) Formic acid (B) Oxalic acid (C) Carbonic acid (D) Acetic acid
- 17 Micro Nutrients are required in a quantity ranging from  
(A) 6 - 200 g (B) 6 - 200 g (C) 4 - 40 kg (D) 60 - 400 kg

QUESTION NO. 2 Write short answers any Eight (8) of the following

16

1.	Why $\text{Na}^+$ is smaller than Na atom ?
2.	What do you know about S-block Elements ? Give two examples
3.	Give two properties of Alkaline Earth metals
4.	Give chemical formulas of Sylvite and Spodumene
5.	What happens when Borax is dissolved in water ?
6.	Give two uses of Boric Acid
7.	Give two points regarding peculiar behaviour of carbon
8.	Give two methods of preparation of $\text{NO}_2$
9.	Give two dissimilarities between oxygen and sulphur
10.	What are nitrogenous fertilizers ? Give two examples
11.	Why potassium fertilizers are important for plants ? Give one example of a potassium fertilizer
12.	Define cement. Why is it called Portland cement ?

QUESTION NO. 3 Write short answers any Eight (8) of the following

16

1.	How does oxidation state of halogen affect the acidic strength of oxyacids of halogen ?
2.	Write factors affecting the oxidizing power of halogens
3.	Write reactions of chlorine with cold and hot NaOH
4.	Define substitutional alloys and give one example
5.	Why transition elements show colour
6.	Write objections to Kekule's formula of benzene
7.	Compare the reactivity of benzene and alkene
8.	How will you distinguish between methanal and ethanal ?
9.	Write chemistry of Fehling's solution test
10.	Write reactions of acetic acid with (a) $\text{PCl}_5$ (b) $\text{SOCl}_2$
11.	Give mechanism of esterification
12.	Write manufacture of acetic acid from acetylene

QUESTION NO. 4 Write short answers any Six (6) of the following

12

1.	What is octane number of Gasoline ?
2.	What is catalytic cracking ?
3.	What is Sabatier-Senden's reaction ? Give its industrial importance
4.	What is Clemmensen and Wolf-Kishner's reduction reaction
5.	What is Wurtz synthesis ? Give its reaction
6.	Draw structure of primary, secondary and tertiary alkyl halide from the given compound $\text{C}_6\text{H}_{13}\text{Cl}$
7.	Give the formation of ortho and para hydroxy benzene sulphonic acid from phenol
8.	Why phenol is more acidic than that of alcohol
9.	How will you convert methane into ethane ?

SECTION-II

Note: Attempt any Three questions from this section

8 x 3 = 24

Q.5-(A)	Write similarities and differences of Halogens with Hydrogen
(B)	Explain construction and working of Diaphragm cell
Q.6-(A)	Briefly explain the following general characteristics properties of transition elements (i) Paramagnetism (ii) Binding Energies
(B)	What are dehydrogenating agents ? Give any four reactions in which sulphuric acid play the role of dehydrating agent
Q.7-(A)	Write a note on the cracking of Hydrocarbons
(B)	What types of Aldehydes give Cannizzaro's reaction ? Give its mechanism
Q.8-(A)	Give the preparation reactions of alkanes from (i) Carbonyl compounds (ii) Alkyl Halides
(B)	Explain the following terms by giving suitable examples (i) Nucleophile (ii) Electrophile (iii) Leaving group (iv) Substrate
Q.9-(A)	Write the nitration reaction of benzene with mechanism
(B)	How phenol is prepared from (i) Chlorobenzene (ii) Sodium salt of Benzene Sulphonic Acid



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**QUESTION NO. 1**

- 1 Which compound will have maximum repulsion with H<sub>2</sub>O ?  
(A) C<sub>6</sub>H<sub>6</sub> (B) C<sub>2</sub>H<sub>5</sub>OH (C) CH<sub>3</sub>-CH<sub>2</sub>-CH<sub>2</sub>-CH<sub>2</sub>-OH (D) CH<sub>3</sub>-O-CH<sub>3</sub>
- 2 Micronutrients are required in quantity ranging from  
(A) 4 - 40 g (B) 6 -200 g (C) 6 - 200 kg (D) 4 - 40 kg
- 3 Which is the strongest acid ?  
(A) HClO (B) HClO<sub>2</sub> (C) HClO<sub>3</sub> (D) HClO<sub>4</sub>
- 4 Which halogen occurs naturally in positive oxidation state ?  
(A) Fluorine (B) Chlorine (C) Bromine (D) Iodine
- 5 Acetone reacts with HCN to form cyanohydrins , it is an example of  
(A) Electrophilic addition (B) Electrophilic substitution (C) Nucleophilic addition  
(D) Nucleophilic substitution
- 6 Which of the following compound will not give iodoform test on treatment with I<sub>2</sub>/NaOH ?  
(A) Acetaldehyde (B) Acetone (C) Butanone (D) 3-Pentanone
- 7 Which of the following derivatives cannot be prepared directly from Acetic Acid ?  
(A) Acetamide (B) Acetyl chloride (C) Acetic anhydride (D) Ethyl acetate
- 8 Which one of the following is not a fatty acid ?  
(A) Propanoic acid (B) Acetic acid (C) Phthalic acid (D) Butanoic acid
- 9 Mark the correct statement  
(A) All lanthanides are present in same group (B) All halogens are present in same period  
(C) All the alkali metals are present in same group (D) All noble gases are present in same period
- 10 Which ion will have maximum value of heat of hydration  
(A) Na<sup>+</sup> (B) Cs<sup>2+</sup> (C) Ba<sup>2+</sup> (D) Mg<sup>2+</sup>
- 11 Which element belongs to group IVA of periodic table  
(A) Barium (B) Iodine (C) Lead (D) Oxygen
- 12 Oxidation of "NO" in air produces  
(A) N<sub>2</sub>O (B) N<sub>2</sub>O<sub>3</sub> (C) N<sub>2</sub>O<sub>4</sub> (D) N<sub>2</sub>O<sub>5</sub>
- 13 The total number of transition elements is  
(A) 10 (B) 14 (C) 40 (D) 58
- 14 The chemist who synthesized urea from ammonium cyanate was  
(A) Berzelius (B) Kolbe (C) Wholer (D) Lavoisier
- 15 The presence of double bond in compound is sign of  
(A) Saturation (B) Un-saturation (C) Sublimation (D) Crystallization
- 16 Aromatic hydrocarbons are the derivative of  
(A) Paraffins (B) Alkene (C) Benzene (D) Cyclohexane
- 17 Which one of the following is not nucleophile  
(A) H<sub>2</sub>O (B) H<sub>2</sub>S (C) BF<sub>3</sub> (D) NH<sub>3</sub>

**SECTION-I**

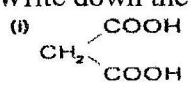
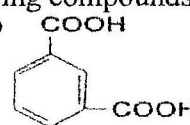
**QUESTION NO. 2 Write short answers any Eight (8) of the following**

16

1	Define Ionization energy. How does it vary in periodic table
2	Define hydration energy. Give one example
3	Complete the following reactions (i) $\text{Be} + \text{NaOH} \rightarrow$ (ii) $\text{LiNO}_3 \rightarrow$
4	Write two advantages of Down's cell process
5	Write four uses of Borax
6	Aqueous solution of Borax is alkaline in nature why ?
7	Write balanced equations for the reactions of $\text{H}_3\text{BO}_3$ with (a) $\text{C}_2\text{H}_5 - \text{OH}$ (b) $\text{NaOH}$
8	Write two reactions which show oxidizing behavior of $\text{N}_2\text{O}$
9	Write two reactions which show reducing behavior of $\text{HNO}_2$
10	What are macronutrients ? Write their range per acre
11	Write four qualities of a good fertilizer
12	Name two calcareous and two argillaceous raw materials for cement

**QUESTION NO. 3 Write short answers any Eight (8) of the following**

16

1	What are disproportion reactions ? Give one example
2	Why HF is a weaker acid than HCl ?
3	Give four uses of Bleaching powder
4	What is variable oxidation state ? Why the transition elements show variable valency or oxidation state ?
5	Define corrosion. How corrosion is promoted when metal is dipped in water
6	What happens when a mixture of benzene vapours and air is passed over heated vanadium pentoxide ?
7	Define the terms with an example (a) Oxidation of Benzene (b) Sulphonation of Benzene
8	Give the mechanism of addition of sodium bisulphite to acetone
9	Give the mechanism of addition of HCN to acetone
10	Write down the names of the following compounds by IUPAC system (i)  (ii) 
11	How will you convert ? (i) Acetic acid into Acetamide (ii) Acetic acid into Acetone
12	What happens when we heat ? (i) Calcium acetate (ii) Sodium formate with Soda lime

**QUESTION NO. 4 Write short answers any Six (6) of the following**

12

1	Define organic chemistry. What is vital force theory ?
2	What is steam cracking ? Give its application
3	What do you know about Clemmensen reduction and Wolf-Kishner's reduction ?
4	Give four uses of methane
5	How would you convert Ethyne into Oxalic Acid ?
6	Define nucleophilic substitution reactions. Name its two types
7	Give two properties of $\text{S}_{\text{N}}1$ reactions
8	Why phenol is acidic in nature ?
9	How would you prepare Bakelite from phenol ?

**SECTION-II**

**Note: Attempt any Three questions from this section**

**8 x 3 = 24**

Q.5-(A)	Discuss the commercial preparation of caustic soda by diaphragm cell (Diagram is not require)
(B)	Discuss periodic trend in properties of elements (i) Melting point in groups and periods (ii) Boiling point in groups and periods
Q.6-(A)	Write down two reactions of sulphuric acid in which it behaves as oxidizing agent and two reactions in which it behaves as dehydrating agent
(B)	Explain the cathode coating and anode coating of iron
Q.7-(A)	What is structural isomerism ? Explain it's different types (any three)
(B)	How does acetone react with HCN and give it's reaction mechanism ?
Q.8-(A)	Write a detailed note on Halogenation of Methane
(B)	Write note on the following (i) Classification of Alkyl halides (ii) Wurtz Synthesis
Q.9-(A)	Explain structure of Benzene on the basis of Atomic orbital treatment
(B)	Write two methods for the preparation of phenol