

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. Write **PAPER CODE**, which is printed on this question paper, on the both sides of the Answer Sheet and fill bubbles accordingly, otherwise the student will be responsible for the situation. Use of Ink Remover or white correcting fluid is not allowed.

Q.1

- 1) Which of the following derivative cannot be prepared directly from acetic acid.
(A) Acetamide (B) Acetylchloride (C) Ethylacetate (D) Acetic anhydride
- 2) For which crop ammonium nitrate fertilizer is not used
(A) Cotton (B) Wheat (C) Sugar cane (D) Paddy rice
- 3) Mark the correct statement.
(A) Metallic character increases down the group (B) Metallic character increases from left to right in a period (C) Metallic character remains the same down the group (D) Metallic character remains the same from left to right in a period
- 4) Down's cell is used to prepare
(A) Sodium carbonate (B) Sodium metal (C) Sodium bicarbonate (D) Sodium hydroxide
- 5) Which element forms ion with charge +3
(A) Be (B) Al (C) Si (D) C
- 6) Among group VA elements, the most electronegative element is
(A) Sb (B) N (C) P (D) AS
- 7) Which is the strongest acid in aqueous solution
(A) HClO (B) HClO₃ (C) HClO₂ (D) HClO₄
- 8) The anhydride of HClO₄ is
(A) ClO₂ (B) ClO₃ (C) Cl₂O₃ (D) Cl₂O₇
- 9) Which of the following is a non typical transition element
(A) Cr (B) Mn (C) Zn (D) Fe
- 10) Select from the following the one which is alcohol?
(A) CH₃-CH₂-Br (B) CH₃-CH₂-OH (C) H₃C-O-CH₃ (D) H₃C-COOH
- 11) β, β' - dichloroethyl sulphide is commonly known as
(A) Mustard gas (B) Laughing gas (C) Phosgene gas (D) Bio-gas
- 12) Which one of the following groups is meta director
(A) -OH (B) -NH₂ (C) -NO₂ (D) -OCH₃
- 13) Which one of the following is not a nucleophile?
(A) H₂O (B) H₂S (C) BF₃ (D) NH₃
- 14) Methyl alcohol is not used as
(A) A solvent (B) An anti-freezing agent (C) A substitute for petrol (D) Denaturing agent
- 15) Formalin is
(A) 10 % solution of formaldehyde in water (B) 20 % solution of formaldehyde in water (C) 40 % solution of formaldehyde in water (D) 60 % solution of formaldehyde in water
- 16) Acetone reacts with HCN to form a cyanohydrin is an example of
(A) Electrophilic addition reaction (B) Electrophilic substitution reaction (C) Nucleophilic addition reaction (D) Nucleophilic substitution reaction
- 17) Which acid is used in the manufacture of synthetic fibre.
(A) Malonic acid (B) Acetic acid (C) Oxalic acid (D) Phthalic acid

Warning:- Please, do not write anything on this question paper except your Roll No.
1221 (Inter Part - II) (Session 2017-19 to 2019-21)

Chemistry (Subjective)
Time Allowed: 2.40 hours

(Group I)
540-I-21

Paper (II)
Maximum Marks: 68

Section ----- I

2. Answer briefly any Eight parts from the followings:- $8 \times 2 = 16$
- The hydration energies of the ions are in the following order. Why? $Al^{+3} > Mg^{+2} > Na^{+1}$
 - Lanthanide contraction controls the atomic sizes of elements of 6th and 7th periods.
 - What is the effect of heat on $CaSO_4 \cdot 2H_2O$?
 - The reaction of alkali metal oxide with water is an acid-base reaction and not an oxidation reduction reaction, why?
 - How carbon differs from remaining members of group IV-A elements.
 - What are the common properties of group IV-A elements. (vii) Give two uses of Boric acid.
 - Give two reactions for the preparation of Dinitrogen oxide (N_2O).
 - Give equation to describe the reaction of NO_2 with H_2S and KI .
 - What is meant by prilling? (xi) Describe the composition of a good portland cement.
 - What are essential nutrient elements and why these are needed for plant growth?
3. Answer briefly any Eight parts from the followings:- $8 \times 2 = 16$
- Why HF is weaker acid than HCl? (ii) Draw Structural formula of OF_2 and O_2F_2 .
 - What is the oxidation state of chlorine in $HClO_4$ and $HClO$?
 - What is Paramagnetism? Give example. (v) Discuss Cathode Coating.
 - Draw resonance Structures of Benzene. (vii) Convert n-Hexane into Benzene.
 - What is the composition of formalin? (ix) How would you differentiate between methanol and Ethanol?
 - How Acetic Acid is prepared from Acetylene?
 - Name the Esters which produce Jasmine and Pineapple flavours.
 - "Boiling point of Carboxylic Acid is relatively high" Justify.
4. Answer briefly any Six parts from the followings:- $6 \times 2 = 12$
- Define functional group, Give one example.
 - Differentiate between catalytic and steam cracking.
 - Discuss reactivity of π - bond.
 - Give mechanism of bromination of ethene.
 - Write industrial preparation of ethyne.
 - Write any four differences between E_1 and E_2 reactions.
 - Define electrophile and nucleophile.
 - Discuss the denaturing of alcohol.
 - How is Bakelite prepared? Give reaction.

Section ----- II

Note: Attempt any three questions.

$(8 \times 3 = 24)$

- (a) Define ionization energy, on what factors it depends. Give its periodic trend.
(b) Describe Commercial preparation of sodium metal by Down's Cell.
- (a) H_2SO_4 is a dehydrating agent and oxidizing agent, prove this truth by giving two examples of each.
(b) Describe following general characteristics of transition elements.
(i) Melting and boiling point. (ii) Covalent and ionic radii
- (a) Explain the Structures of Ethane and ethyne based on hybridization.
(b) What is Cannizarro's reaction? Give its mechanism.
- (a) Give any two methods of preparation of alkene (ethene) and also give two oxidation reactions of ethene.
(b) Differentiate between S_N1 and S_N2 reactions.
- (a) Explain the comparison of reactivities of Alkanes, Alkenes & Benzene.
(b) How will you convert phenol into
(i) Benzene (ii) Picric Acid (iii) Cyclohexanol (iv) Bakelite

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Q.1

- 1) Which reagent is used to reduce a carboxylic group to an alcohol.
(A) H_2/Ni (B) H_2/Pt (C) $NaBH_4$ (D) $LiAlH_4$
- 2) An aqueous solution of an organic compound reacts with Na_2CO_3 to produce CO_2 gas. Which one of the following could be organic compound
(A) $CH_2=CH-C_6H_5$ (B) CH_3CH_2COOH (C) CH_3COCH_3 (D) CH_3CHO
- 3) Phosphorous helps the growth of
(A) Root (B) Leave (C) Stem (D) Seed
- 4) Mark the correct statement.
(A) Cl^- (ion) and Cl (atom) are equal in size
(B) Cl^- ion is smaller than Cl atom
(C) Na^+ is larger than Na -atom
(D) Na^+ is smaller than Na -atom
- 5) The mineral $CaSO_4 \cdot 2H_2O$ has the general name.
(A) Dolomite (B) Calcite (C) Epsom (D) Gypsum.
- 6) The Chief ore of Aluminium is
(A) Na_3AlF_6 (B) $Al_2O_3 \cdot H_2O$ (C) Al_2O_3 (D) $Al_2O_3 \cdot 2H_2O$
- 7) Which of the following species has the maximum number of unpaired electrons.
(A) O_2 (B) O_2^{+2} (C) O_2^{+1} (D) O_2^{-2}
- 8) Which is the strongest acid.
(A) $HClO_3$ (B) $HClO_2$ (C) $HClO_4$ (D) $HClO$
- 9) Which halogen occurs naturally in a positive oxidation state.
(A) Bromine (B) Iodine (C) Chlorine (D) Fluorine
- 10) The colour of transition metal complexes is due to
(A) d – d transition of electrons
(B) Paramagnetic nature of transition of elements
(C) Ionization
(D) Loss of s-electrons
- 11) Linear shape is associated with which set of hybrid orbitals
(A) dsp^2 (B) sp^3 (C) sp (D) sp^2
- 12) Vinyl acetylene combines with HCl to form
(A) Phenyl acetylene (B) Benzene (C) Chloroprene (D) Divinyl acetylene
- 13) Benzene cannot undergo
(A) Substitution reactions
(B) Addition reactions
(C) Oxidation reactions
(D) Elimination reactions
- 14) For which mechanism, the first step involved is same.
(A) $E1$ & $E2$ (B) $E2$ & S_N2 (C) S_N1 and $E2$ (D) $E1$ & S_N1
- 15) Which compound is called a universal solvent.
(A) H_2O (B) CH_3OH (C) C_2H_5OH (D) CH_3-O-CH_3
- 16) Which of the following will have the highest boiling point.
(A) Methanal (B) Ethanal (C) 2-Hexanone (D) Propanal
- 17) Acetone reacts with HCN to form a cyanohydrin. It is an example of
(A) Electrophilic addition
(B) Electrophilic substitution
(C) Nucleophilic addition
(D) Nucleophilic substitution

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221 (Inter Part - II)

(Session 2017-19 to 2019-21)

Chemistry (Subjective)

(Group II)

Paper (II)

Time Allowed: 2.40 hours

SGD-II-21

Maximum Marks: 68

Section ----- I

2. Answer briefly any Eight parts from the followings:- $8 \times 2 = 16$

- (i) Why Second ionization Energy is higher than First Ionization Energy?
- (ii) Define Hydration Energy. Give example also.
- (iii) Give chemical formula of Carnallite and Barite.
- (iv) What is Plaster of Paris? (v) Give two Points regarding Peculiar behaviour of Boron.
- (vi) Give two important uses of Boric Acid. (vii) "Boric Acid is a weak Acid". Justify.
- (viii) What do you know about Ring Test?
- (ix) How H_2SO_4 acts as oxidizing Agent? Give two reactions.
- (x) How would you prepare Diammonium Phosphate fertilizer?
- (xi) What do you know about Slurry? (xii) Write down two qualities of a good fertilizer.

3. Answer briefly any Eight parts from the followings:- $8 \times 2 = 16$

- (i) Why HF is weaker acid than HCl? (ii) What are disproportionation reactions? Give one example
- (iii) What is meant by available chlorine? (iv) Define interstitial alloys.
- (v) A damaged tin plated iron get rusted quickly comment.
- (vi) Define resonance energy. Give one example. (vii) Describe Wurtz-Fitting reaction with one example.
- (viii) Give the use of Tollen's test. (ix) How $NaHSO_3$ is added to acetone, give mechanism.
- (x) Write any two methods of preparation of Acetic acid.
- (xi) Give reactions of acetic acid with (a) PCl_5 (b) $NaOH$
- (xii) Explain oxidative cleavage of alkene briefly.

4. Answer briefly any Six parts from the followings:- $6 \times 2 = 12$

- (i) How octane number of alkanes can be improved.
- (ii) Define tautomerism by giving one example.
- (iii) Why alkanes are called paraffins?
- (iv) Give the formation of formic acid by catalytic oxidation of alkane.
- (v) Define electrophile. Give examples.
- (vi) What is β - Elimination reaction? Give an example of β - $E2$ elimination reaction.
- (vii) What is meant by denaturing of Alcohol?
- (viii) Why Absolute Alcohol cannot be prepared by fermentation method?
- (ix) How acetaldehyde can be prepared from an alkyne?

Section ----- II

Note: Attempt any three questions.

$(8 \times 3 = 24)$

5. (a) Define oxidation state. Give its trend in the Periodic Table.
(b) How Down's Cell is used to prepare pure Sodium metal?
6. (a) Describe the chemistry of the industrial preparation of sulphuric acid from sulphur by the contact process
(b) Give any Four properties of Transition Elements.
7. (a) Discuss in detail cis-Trans Isomerism.
(b) Describe with mechanism Aldol condensation reaction. Why Formaldehyde does not give this reaction?
8. (a) Give Kolbe's Electrolytic Method for the preparation of Alkanes with Mechanism.
(b) Write a detailed note on S_N2 reactions of alkyl halides.
9. (a) Explain the structure of Benzene by Resonance Method.
(b) Write the reaction of phenol with following.
(i) $NaOH$ (ii) CH_3COCl (iii) Zn (iv) Br_2

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