

Name _____

Roll No. _____

CLASS-XII — CHEMISTRY

WORKSHEET

1. THE SOLID STATE

1 Mark Questions

1. What is the packing efficiency of FCC arrangement?
2. Give example of a crystal which can show both Schottky and Frenkel defects?
3. What are voids?

2 Marks Questions

1. Explain F-centers in the crystals.
2. Ionic solids conduct electricity in molten state but not in solid state. Explain.
3. Explain how Boron doped Silicon is a p-type semiconductor?

3 Marks Questions

1. What are the differences b/w Schottky and Frenkel defects?
2. What is meant by the term coordination no.? What is the C. No. of atoms in a (i) CCP Structure, (ii) BCC structure
3. Niobium (Nb) crystallises in a bcc structure. If density is 8.55 g/cm^3 calculate atomic radius of (Niobium) (Nb). Atomic mass of Nb = 93μ .

5 Marks Questions

1. Calculate the packing efficiency of a metal crystal for a SCC lattice.
(ii) If 3 elements P, Q & R crystallise in a cubic lattice with P atoms at corners, Q atoms at body center and R atoms at face centers, then write the formula of compound.

1. SOLID STATE

1 Mark Question

1. What is the packing efficiency of bcc arrangement?
2. Which defect in crystals decreases the density of a solid?
3. What is the no. of atoms per unit cell in a FCC structure?

2 Marks Question

1. Explain why P doped silicon is a semiconductor?
2. Define-
 - (i) Unit cell
 - (ii) Coordination number.
3. In a cubic lattice, atoms X are present at the corners of unit cell and Y at the body center. What is the simplest formula of compound.

3 Marks Question

1. The density of lead is 11.35 g/cm^3 and the metal crystallises in FCC unit cell. Calculate the radius of lead atom.
(At. mass of Pb = 207 and $N_A = 6.22 \times 10^{23}$)
2. Explain-
 - (i) Ferromagnetism
 - (ii) Paramagnetism
 - (iii) Diamagnetism.
3. Explain why a crystal of NaCl becomes golden yellow when it is heated with Na vapours?

5 Marks Question

1. Cu crystallises with FCC unit cell. If the radius of Cu atom is 127.8 pm, then calculate the density of Cu metal. (A mass of cu = 63.5 u)

Name _____

Roll No. _____

CLASS-XII — CHEMISTRY

WORKSHEET

2. SOLUTIONS

1 Mark Question

1. What are isotonic solutions?
2. Give one example of a Semi Permeable membrane?
3. State Henry's Law.

2 Marks Question

1. Explain molarity and molality of a solution.
2. What are azeotropes? Give one example of each maximum and minimum boiling azeotropes.
3. State and explain Raoult's Law.

3 Marks Question

1. What are the differences b/w ideal and Non-Ideal solutions.
2. Determine the osmotic pressure of a solution of 25 mg of K_2SO_4 in 2lt. of water at $25^\circ C$ by assuming its complete dissociation.
3. Conc. HNO_3 is 68% by mass aqueous solution. What is the molarity of the solution if its density is 1.504 g/cm^3 .

5 Marks Question

1. What do you mean by elevation in boiling point? Show that it is a colligative property?

2. SOLUTION

1 Mark Question

1. What are colligative properties?
2. What is the total sum of mole fractions of all the components in a ternary solution?
3. What is Osmosis?

2 Marks Question

1. State and explain Raoult's Law for Non-Volatile solutes.
2. What is meant by vapour pressure of a liquid? How do temperature affects vapour pressure?
3. Arrange following solution in the increasing order of their osmotic pressures by giving reason?
 - (i) 34.2 g/l Sucrose
 - (ii) 58.5 g/l NaCl
 - (iii) 60 g/l NH_2CONH_2

3 Marks Question

1. A 5% by mass solution of sugar in water has freezing point 271 K. Calculate the freezing point of a 5% glucose solution in H_2O if F. Pt. of pure H_2O = 273/15 K.
2. Calculate the mass of a non-volatile solute ($M = 40$) which should be dissolved in 114 gm octane to reduce its vapour pressure by 80%
3. A solution is heated from 25°C to 50°C. will its molarity be same, less or more? Comment.

5 Marks Question

1. What is vant Hoff's factor? What is the value of its for dissociation and association of solutes in solution. How it is related to degree of dissociation of electrolyte?

Name _____

Roll No. _____

CLASS-XII — CHEMISTRY

WORKSHEET

3. ELECTROCHEMISTRY

1 Mark Question

1. Define resistivity.
2. State Faraday's 1st Law of electrolysis.
3. What is the relationship b/w ΔG and E cell?

2 Marks Question

1. Predicts the products of electrolysis in an aqueous solution of AgNO_3 with Ag electrodes and with Pt electrodes.
2. How much electricity is required in coulomb for oxidation of 1 mole of H_2O to O_2 .
3. The conductivity of 0.20 M Solⁿ of KCl at 298 K is 0.024 Scm^{-1} . Calculate its molar conductivity.

3 Marks Question

1. Write chemical reactions involved in the recharging of a lead storage cell.
2. Explain methods of prevention of corrosion.
3. The conductivity of 0.001028 M acetic acid is $4.95 \times 10^{-5} \text{ Scm}^{-1}$. Calculate its dissociation constant, if Λ_m° for acetic acid is 390.5 mole^{-1} .

5 Marks Question

1. Calculate emf of cell in which following reaction takes place—
 $\text{Ni(s)} + 2 \text{Ag}^+ (0.002\text{M}) \rightarrow \text{Ni}^{2+} (0.160\text{M}) + 2 \text{Ag(s)}$ given that $E^\circ_{\text{cell}} = 1.05 \text{ V}$.

3. ELECTROCHEMISTRY

1 Mark Question

1. Can we store CuSO_4 solution in a Fe vessel?
2. Define conductance of a solution.
3. What is the charge on 1 mole electrons?

2 Marks Question

1. Differentiate b/w metallic and electrolytic conductors?
2. State and explain Kohlrausch's law.
3. What are the advantage of Fuel cells.

3 Marks Question

1. Explain the functions of salt-bridge?
2. Define molar conductivity of a solution? How for weak and strong electrolyte, molar conductivity changes with concentration of solute.
3. Explain construction and working of $\text{H}_2 - \text{O}_2$ fuel cell.

5 Marks Question

1. (i) A voltaic cell is set up at 25°C with the following half cells, Ag^+ (0.001M)/Ag and Cu^{2+} (0.01M) /Cu.

What will be the voltage of this cell.

$$E^\circ \text{ cell} = 0.46 \text{ V.}$$

- (ii) What is the unit of specific resistance?

Name _____

Roll No. _____

CLASS-XII — CHEMISTRY

WORKSHEET

4. CHEMICAL KINETICS

1 Mark Question

1. Define Rate of a reaction.
2. The reaction $A + B \rightarrow C$, has zero order. Write its rate equation.
3. A reaction has rate law - $r = K [A]^{3/2} [B]^{-1}$.
What is the order of reaction?

2 Marks Question

1. What are the differences b/w order and molecularity?
2. Define $t_{1/2}$ of a reaction. Calculate $t_{1/2}$ of a 1st order reaction where specific rate constant is 200 sec^{-1} .
3. What are pseudo first order reaction? Give one example.

3 Marks Question

1. A first order reaction takes 40 minutes for 30% decomposition. Calculate its $t_{1/2}$ value.
2. A reaction is of 2nd order with respect to a reactant. How will the rate of reaction.
(i) Doubled (ii) reduced to half?
3. Show that $t_{1/2} \times 10 = t_{99.9\%}$ for a first order reaction

5 Marks Question

1. (i) The rate of a chemical reaction doubles for an increase in 10K in temp. from 298 K. Calculation E_a .
(ii) Define E_a of a reaction.

4. CHEMICAL KINETICS

1 Mark Question

1. What are the units of rate constant for zero order reactions.
2. What is meant by elementary reactions.
3. What is the molecularity of the reaction–
 $\text{Cl} \rightarrow \frac{1}{2} \text{Cl}_2 (\text{g})$.

2 Marks Question

1. What are the difference b/w average and instantaneous rates of a reaction?
2. Define –
 - (i) Threshold energy
 - (ii) Collision frequency.
3. Give the names of 2 methods used to determine rates of fast reactions.

3 Marks Question

1. The rate of a reaction quadruples when temp. changes from 293 to 313 K. Calculate activation energy of reaction.
2. The rate constant for a first order reaction is 60 S^{-1} . How much time will it take to reduce initial conc. of reactants to its $1/16^{\text{th}}$ value.
3. Show that time required for 99% completion is twice the time required for completion of 90% of a first order reaction.

5 Marks Question

1. Explain why rate of reaction is generally doubles for every 10° rise in Temp. Discuss the increase in rate of reaction by rise in Temp. Quantitatively by using Arrhenius Equations.

Name _____

Roll No. _____

CLASS-XII — CHEMISTRY

WORKSHEET

5. SURFACE CHEMISTRY

1 Mark Question

1. What are hydrosol?
2. Give an example of oil in H₂O emulsion?
3. What is electrophoresis.

2 Marks Question

1. What is Brownian motion and its significance?
2. Explain -
 - (i) Coagulation
 - (ii) peptization.
3. What is Hardy-Shultz Law. Explain.

3 Marks Question

1. What are the differences b/w physical and chemical adsorption?
2. Differentiate b/w multimolecular and macro molecular colloids with one example of each.
3. Explain with examples—
 - (i) Lyophilic Sols.
 - (ii) Lyophobic Sols.
 - (iii) Aerosol.
4. Explain what is observed when—
 - (i) NaCl is added to ferric hydroxide sol.
 - (ii) A beam of light is passed through a colloidal sol.
 - (iii) Direct current is passed through a colloidal sol.

5. SURFACE CHEMISTRY

1 Mark Question

1. Give an example of water in oil emulsion.
2. What is CMC.
3. What is dialysis.

2 Marks Question

1. Explain how deltas are formed when rivers meet sea water?
2. Explain Tyndall effect and its cause?
3. Describe Freundlich's adsorption isotherm and explain various symbols used.

3 Marks Question

1. Explain–
 - (i) Gold Number
 - (ii) Coagulation value
 - (iii) Shape selective catalysts.
2. Explain–
 - (i) Bridgman's Arc method.
 - (ii) Colloidal mill.
3. Comment on the statement that "colloid is not a substance but state of a substance."
4. What is demulsification? Name two demulsifiers.
5. (i) Explain 2 Chemical methods for preparation of colloids?
(ii) What is activity of a catalyst?

Name _____

Roll No. _____

CLASS-XII — CHEMISTRY

WORKSHEET

6. GENERAL PRINCIPLES & PROCESSES OF ISOLATION OF ELEMENTS

2 Marks Questions

1. Name the method used refining of zirconium metal.
2. Write the chemical reaction involved in the extraction of silver after the silver ore has been leached with NaCN.
3. Why is froth & location method selected for the concentration of sulphide ores?
4. Which of the two scraps, zinc or Iron would be preferred for the recovery of copper from the leached copper ore and why?
5. Write the principle of zone-refining process.
6. Outline the principles of refining of metals by the following method.
 - (a) Electrolytic refining
 - (b) vapour phase refine.
7. Describe the roles of the following: (while chemical equations & reactions)
 - (a) SiO_2 in the metallurgy of copper.
 - (b) Cryolite (Na_3AlF_6) in the metallurgy of aluminium.
8. (d) Depressant in froth potation process.
9. (e) Iodine in the refining of titanium.
 - (f) Lime stone (CaCO_3) in the metallurgy of iron
10. Write all the reactions involved in the extraction of aluminum from bauxite ore.

3 Marks Questions

1. Differentiate between ore and mineral.
2. What types of ores are separated by magnetic separation?
3. What is meant by pyrometallurgy?
4. Out of C and CO, which is a better reducing agent in the lower temperature range in blast furnace to extract iron from the oxide ore?
5. How is chemical reduction different from electrolytic reduction?
6. Which methods are used usually for the purification of following metals.
 - (a) Silicon / germanium
 - (b) Titanium
7. Explain the role of each of the following in the isolation of elements from their ores.
 - (a) CO in the purification of nickel.
 - (b) Zinc (Zn) in extraction of silver or gold.
8. State the basis of refining a substance by Chromatographic method under what circumstances is this method specially useful?
9. Give reasons for the following:
 - (a) ZnO can be reduced to metal by heating with carbon but not Cr_2O_3 .
 - (b) Extraction of copper directly from sulphide ores is less favourable than that from its oxide ore through reduction.
10. Write Chemical reactions that takes place in the extraction of copper from sulphide ore.

Name _____

Roll No. _____

CLASS-XII — CHEMISTRY

WORKSHEET

p-BLOCK ELEMENTS

- Which one of PCl_4^+ and PCl_4^- is not likely to exist and why?
- Explain why NF_3 is an exothermic compound whereas NaCl_3 is not.
- Nitrogen forms N_2O_5 but not NCl_5 . Why?
- Why does NO_2 dimerise?
- Arrange the following oxo acid of phosphorus in the increasing order of basicity.
 H_3PO_4 , H_3PO_2 , and H_3PO_3
- Account for the following:
 - Bi(V) is a stronger oxidising agent than $\text{S}_6(\text{V})$
 - All the bonds in PCl_5 are not identical.
- What happens when?
 - PCl_5 is heated.
 - H_3PO_3 is heated.
- Complete the following reaction
 - $\text{P}_4 + \text{NaOH} + \text{H}_2\text{O} \rightarrow$
 - $\text{P}_4 + \text{SO}_2\text{Cl}_2 \rightarrow$
- What promoted Neil Bartlett for carrying out the reactions between Xe and PtF_6 ?
 - How is Ozone estimated quantitatively
- How is SO_2 detected?
 - Draw the structures of
 - $\text{H}_2\text{S}_2\text{O}_3$
 - $\text{H}_2\text{S}_2\text{O}_7$

p-BLOCK ELEMENTS

1. Which is more acidic H_2S or H_2Te and why?
2. OF_6 compound is not known why?
3. O_2 and F_2 both stabilise higher oxidation state of metals but the ability of O_2 to stabilise higher oxidation states exceeds that of F_2 .
4. Despite less negative electron gain enthalpy of fluorine than chlorine, fluorine (F_2) is a stronger oxidising agent than chlorine (Cl_2) explain why?
5. SF_6 stable and inert towards hydrolysis why?
6. Draw the structures of following molecules
 - (i) ClF_3
 - (ii) BrF_5
 - (iii) SF_4
 - (iv) HClO_4
 - (v) XeO_3
 - (vi) XeOF_4
7. Arrange the following in the increasing order of the property mentioned against each.
 - (a) F_2 , Cl_2 , Br_2 , I_2 bond dissociation enthalpy
 - (b) HClO_4 , HBrO_4 , HIO_4 acid strength
 - (c) H_2S , PH_3 , HCl acid strength
8. Complete the following equations:
 - (a) $\text{XeF}_6 + \text{KF} \rightarrow$
 - (b) $\text{NH}_3 + \text{Cl}_2$ (Excess) \rightarrow
 - (c) $\text{XeF}_4 + \text{H}_2\text{O} \rightarrow$
 - (d) $\text{XeF}_4 + \text{O}_2\text{F}_2 \rightarrow$
9. Write the formulas and structures of noble gas species which are isostructures with (a) ICl_4^- (b) BrO_3^-
10. (a) Bleaching of flowers by Cl_2 is permanent while that of SO_2 is temporary.
(b) Write the neutral molecule which isoelectronic with ClO^-

Name _____

Roll No. _____

CLASS-XII — CHEMISTRY

WORKSHEET

THE d-AND f-BLOCK ELEMENTS

Account for the following

1. Cu (i) is not known in aqueous solution.
2. CO is a stronger complexing agent than NH_3 although former is less basic than the latter.
3. Cr^{2+} (d^4) is a reducing agent but Mn^{3+} (d^4) is an oxidising agent.
4. CO^{2+} is easily oxidised to CO^{3+} in presence of strong ligand.
5. Corresponding members of 4d-and 5d-transition series have almost identical radii.
6. Write the balanced chemical equations for
 - (a) Oxidation of Fe^{2+} by $\text{Cr}_2\text{O}_7^{2-}$ in acidic medium.
 - (b) Oxidation of $\text{S}_2\text{O}_3^{2-}$ by MnO_4^- in neutral / faintly alkaline medium.
7. Draw the structures of
 - (a) CrO_4^{2-}
 - (b) $\text{Cr}_2\text{O}_7^{2-}$
8. Can we acidify the KMnO_4 solution by dil.HCl in the volumetric analysis. If not why? Write balanced chemical equations of reaction involved.
9. Assign the suitable reason : element to element actinoid contraction is greater than that in lanthanoid contraction.
10. How is potassium dichromate prepared from chromite ore (FeCr_2O_4) ? Write the balanced chemical reactions involved.

THE d AND f BLOCK ELEMENTS

Account for the following

1. Copper (II) Iodide is not known
2. Transition elements form coloured ions in solution.
3. Transition elements show variable oxidation states.
4. Transition elements show higher oxidation states in oxides and fluorides.
5. Transition elements and majority of their compounds are paramagnetic in nature.
6. Write the balanced chemical equation.
 - (a) $\text{MnO}_4^- + \text{I}^- + \text{H}_2\text{O} \rightarrow$
 - (b) $\text{CrO}_4^{2-} + \text{H}^+ \rightarrow$
7. Calculate the number of unpaired electrons in the following gaseous species:
 Mn^{3+} , Cr^{3+} , V^{3+} and Fe^{2+}
Which one of these is most stable in aqueous solutions?
8. How is KMnO_4 prepared in the laboratory from pyrolusite ore? Write balanced Chemical equations for the reaction involved.
9. What is lanthanoid contraction? Write its cause. Mention its effect on the chemistry of post-lanthanide elements.
10. (a) Why do d-block elements exhibit larger number of oxidation states than the f-block elements?
(b) Can we use $\text{Na}_2\text{Cr}_2\text{O}_7$, in place of $\text{K}_2\text{Cr}_2\text{O}_7$ in volumetric analysis? If not why?

Name _____

Roll No. _____

CLASS-XII — CHEMISTRY

WORKSHEET

COORDINATION COMPOUNDS

2 Marks Questions

- Write the IUPAC names of the following compounds
 - $[Pt(NH_3)_4 d_2] d_2$
 - $K_3 [CrF_6]$ (c) $[Ag(NH_3)_2]$ $[Ag(eN)_2]$
- Write the formulas of the following compounds
 - Pentaamminenitrito-N-cobalt (III)
 - Potassiumtri (oxalato) chromate (III)
- $[Fe(CN)_6]^{4-}$ and $[Fe(H_2O)_6]^{3+}$ are of different colour. Why?
- Write all the geometrical isomers of $[Pt(NH_3)(Br)(Cl)(Py)]$
- Draw the structure of a hexadentate ligand.
- Explain using Valence bond theory. Why paramagnetic $[Ni(CO)_4]$ and diamagnetic though both are tetrahedral.
- Explain using crystal field theory that $[Fe(H_2O)_6]^{3+}$ is strongly paramagnetic whereas $[Fe(CN)_6]^{3-}$ is weakly paramagnetic.
- Draw the figure showing splitting of d-orbital in octahedral field created by the ligands. How does the magnitude of crystal field splitting (Δ_o) decides the configuration of an ion having d^4 configuration?
- Describe the synergic bonding in a carbonyl complex.
- Mention the uses of coordination compounds
 - in the estimation of hardness of water.
 - in biological systems.
 - as catalyst in industrial processes.

3 Marks Questions

1. Write the formula of a coordination entity consisting of CO^{3+} , five ammonia molecules and three chloride ions.
2. Explain why CO is a strong field ligand although it is a weak base.
3. The spin-only magnetic moment of $[\text{Mn Br}_4]$ is 5.9 BM. Predict the geometry of the complex ion.
4. Out of the following two coordination entities which is optically active?
 - (a) $\text{cis-}[\text{Cr Cl}_2 (\text{OX})_2]^{3-}$
 - (b) $\text{trans-}[\text{Cr Cl}_2 (\text{Ox})_2]^{3-}$
5. Give evidence that $[\text{Co} (\text{NH}_3)_5 \text{Cl}] \text{SO}_4$ and $[\text{Co} (\text{NH}_3)_5 (\text{SO}_4)] \text{Cl}$ are ionisation isomers.
6. Mention the points which were not explained by valence bond theory and successfully explained by crystal field theory write also the weakness of crystal field theory.
7. Explain the following giving appropriate reasons.
 - (a) CO^{2+} is easily oxidised to CO^{3+} presence of a strong field ligands.
8. Explain the following terms:
 - (a) Ambidentate ligand
 - (b) Denticity of ligand
9. Describe with an example of each, the role of coordination Compounds in (i) Analytical Chemistry (ii) Medicinal Chemistry.
10. Explain why:
 - (a) Tetrahedral complexes do not show geometrical isomerism.
 - (b) In tetrahedral complexes low spin configurations are rarely observed.

Name _____

Roll No. _____

CLASS-XII — CHEMISTRY

WORKSHEET

HALOALKANES AND HALOALKENES

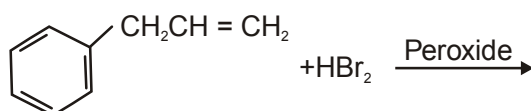
Q1 Arrange the following in the increasing order of property indicated:

Bromomethane, chloromethane, dichloromethane (Increasing order of boiling points)

Q2 Arrange the following in the increasing order of property indicated:

Dichloromethane, chloroform, carbon tetrachloride (increasing order of dipole moment).

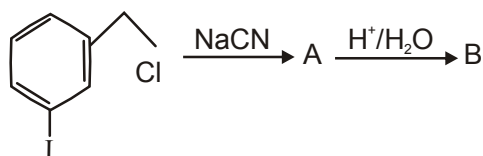
Q3 Complete the following reaction:



Q4 How will you bring about the following conversions?

- (i) Benzene to 3-bromonitrobenzene
- (ii) ethanol to but-1-yne.

Q5 Identify the product formed in the following sequence:



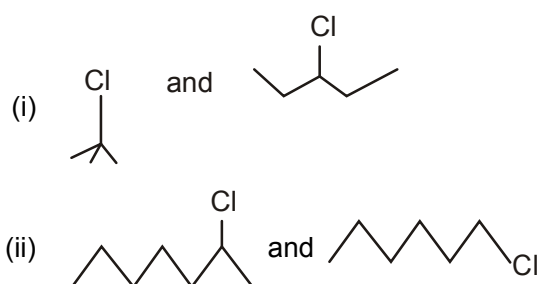
Q6 Identify the product formed in the following sequence:

- (i) $\text{C}_6\text{H}_5\text{CH}_2\text{CH}(\text{Br})\text{CH}_3 \xrightarrow{\text{alc. KOH}} \text{X} \xrightarrow{\text{HBr}} \text{Y}$
- (ii) $\text{CH}_3\text{CH}(\text{Br})\text{CH}_3 \xrightarrow{\text{alc. KOH}} \text{X} \xrightarrow[\text{H}_2\text{O}_2]{\text{HBr}} \text{Y}$

Q7 Give a chemical test to distinguish between the following pairs of compounds:

- (i) Chlorobenzene and cyclohexylchloride.
- (ii) vinyl chloride and ethyl chloride
- (iii) n-propyl bromide and isopropyl bromide

Q8 In the following pairs which halogen compound undergoes faster S_N1 reaction?



Q9 give reasons for the following

- (i) Haloalkanes react with KCN to form alkyl cyanide as main product while AgCN alkyl isocyanide in the main product.
- (ii) Sulphuric acid is not used in the reaction of alcohol with KI.
- (iii) Thionyl chloride is the preferred reagent for converting ethanol to chloroethane

Q10 Explain the following reaction with suitable example:

- (i) Swarts reaction
- (ii) Wurtz reaction
- (iii) Wurtz-Fittig reaction
- (iv) Friedel-Craft's alkylation reaction
- (v) Galtermann's reaction

Name _____

Roll No. _____

CLASS-XII — CHEMISTRY

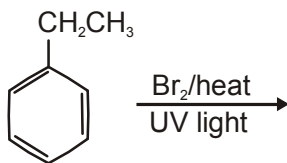
WORKSHEET

HALOALKANES AND HALOARENES

Q1 Arrange the following in increasing order of property indicated: 1
1-chloropropane, isopropyl chloride, 1-chlorobutane (increasing order of boiling point)

Q2 Arrange the following in increasing order of property indicated: CH_3F , $(\text{H}_3\text{C})_2\text{CHCl}$, CH_3Br , CH_3I (Increasing reactivity towards nucleophilic substitution and increasing order of dipole moment)

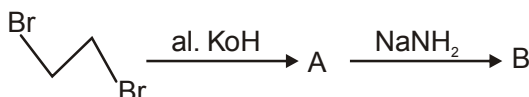
Q3 Complete the following reaction: 1



Q4 How will you bring about the following conversions? 2

- (i) 1-bromopropane to 2-bromopropane.
(ii) benzene to 4-bromo-1-nitrobenzene

Q5 Identify the products formed in the following sequence: 2



Q6 Identify the products formed in the following sequence: 2

- (i) $\text{CH}_3\text{CH}_2\text{CH}=\text{CH}_2 + \text{Br}_2 \xrightarrow{\text{CCl}_4} \text{A}$
(ii) $\text{CH}_3\text{CH}_2\text{CH}=\text{CH}_2 + \text{Br}_2 \xrightarrow[\text{UV Light}]{\text{heat}} \text{B}$

Q7 Which of the compound in each of the following pairs will react faster in $\text{S}_{\text{N}}2$ reaction with OH^- and why?

- (i) CH_3Br or CH_3I
- (ii) $(\text{CH}_3)_3\text{Cu}$ or CH_3u

Q8 Give reasons for the following:

- (i) The bond length of C-u bond is larger in haloalkanes than that in haloarenes
- (ii) Although alkyl halides are polar in nature but are not soluble in H_2O .
- (iii) tert-butyl bromide has lower boiling point than n-Butyl bromide.

Q9 Give reasons for the following:

- (i) Grignard reagent should be prepared under anhydrous conditions.
- (ii) The dipole moment of chlorobenzene is lower than that of cyclohexyle chloride.
- (iii) vinyl chloride is unreactive in nucleophilic substitution reaction.

Q10 Identify A, B, C, D, E, R and R' in the following sequence of reactions.

Name _____

Roll No. _____

CLASS-XII — CHEMISTRY

WORKSHEET

ALCOHOLS, PHENOLS AND ETHERS

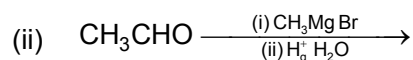
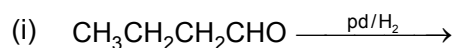
Q1 Give reason for the following:

O-nitro phenol is steam volatile but p-nitrophenol is not 1

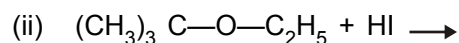
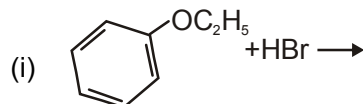
Q2 Arrange the following in increasing order of property shown methanol, ethanol, diethylether, ethyleneglycol (Boiling point)

Q3 Give a chemical test to distinguish between the following pair of compounds.
n-propyl alcohol and isopropylalcohol.

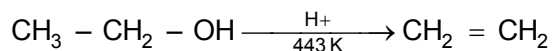
Q4 Complete the following reactions



Q5 Complete the following reactions 2



Q6 Write the mechanism for following reaction: 2



(acid catalysed dehydration of alcohols)

Q7 Describe the following reaction with example: 3

(i) Hydroboration oxidation of alkenes

(ii) Acid catalysed dehydration of alcohol at 443 K.

(iii) Willamsour synthesis

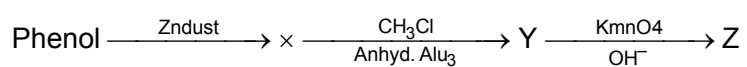
Q8 How will you convert 3

(i) Propene to propane-1-ol

(ii) anisole to phenol

(iii) Buton -2- one to butan-2-ol

Q9 Identify X, Y and Z in the following sequence of reaction: 3



Q10 What happens when: 5

(i) Aluminium reacts with test-butyle alcohol

(ii) Phenol is oxidised with chromic acid.

(iii) Cumene is oxidised in the presence of air and product found is treated with dilute acid.

(iv) Phenol is treated with conc. HNO_3

(v) Phenol is treated with chloroform in presence of dilute NaOH.

Name _____

Roll No. _____

CLASS-XII — CHEMISTRY**WORKSHEET****ALCOHOLS, PHENOLS AND ETHERS**

Q1 Give reason for the following : 1

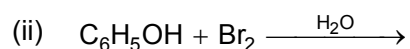
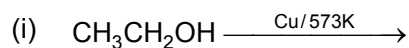
Methanol is less acidic than water

Q2 Arrange the following in the increasing order of property shown: 1

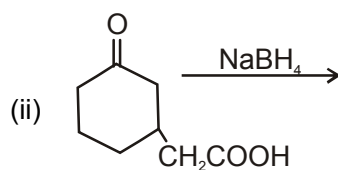
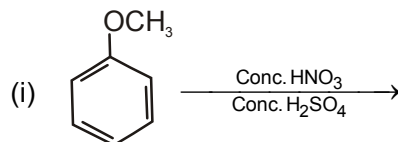
Phenol, O-nitrophenol, m-nitrophenol, p-nitrophenol (boiling points)

Q3 give a chemical test to distinguish between the following pair of compounds
Cyclohexanol and phenol

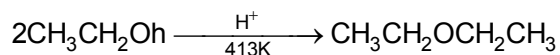
Q4 Complete the following reaction 2



Q5 Complete the following reaction 2



Q6 Write the mechanism for following reaction : 2



(acid catalysed nucleophilic substitution reaction)

- Q7 How will you convert 3
- (i) ethanol to ethanol
 - (ii) Phenol to ethonybenzene
 - (iii) 1-Phenylethene to 1-phenylethanol
- Q8 Identify X,Y, and Z in the following sequence of reaction 3
- $$\text{Ethanol} \xrightarrow{\text{PBr}_3} \text{X} \xrightarrow{\text{Alc. KOH}} \text{Y} \xrightarrow{\text{dil H}_2\text{SO}_4} \text{Z}$$
- Q9 Give reason for the following: 3
- (i) Nitrophenol is more acidic thano O-metho nyphenol
 - (ii) Phenol is more reaction towards electrophilic substitution reaction than benzene.
 - (iii) Write the suitable reaction for the pupration of t-butyle ethyl ether.
- Q10 How will you convert 5
- (i) Formaldehyde to cyclohexylmethanol
 - (ii) butyle bromide to pentan -1-ol
 - (iii) toluene to bezyle alcohol
 - (iv) 1-propoxypropane to propyle iodide
 - (v) ethyle bromide to 1-ithoxyethane.

Name _____

Roll No. _____

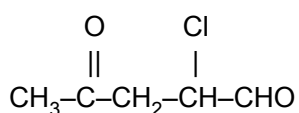
CLASS-XII — CHEMISTRY

WORKSHEET

ALDEHYDES, KETONES AND CARBOXYLIC ACIDS

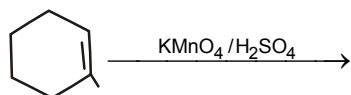
2 Marks Questions

- Q1 Write the IUPAC name of the following organic compound 1



- Q2 Explain the following reaction and give example Decarbonylation reaction

- Q3 Complete the following reaction: 1



- Q4 Complete the following reaction giving one example of each:

- (i) Rosenmund reduction reaction
- (ii) Stephen reaction

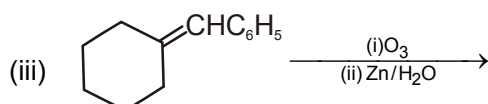
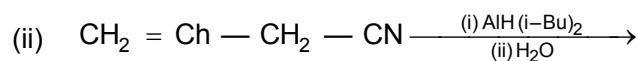
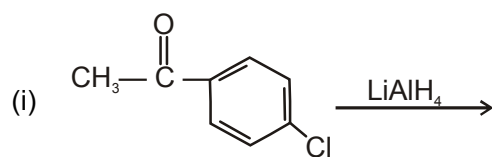
- Q5 Complete the following reaction giving one example of each: 2

- (i) Kolbe's reaction
- (ii) Hell-Volhard-Zelinsky reaction

- Q6 give one chemical test to distinguish between the following pair of compounds write the chemical reaction involved. 2

- (i) Propan-2-ol and propanone
- (ii) ethyle acetate and methyl acitate

- Q7 Complete the following reaction 3



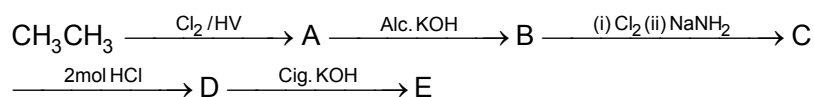
Q8 Give reason for the following: 3

- (i) Cyclohexanone form cyanohydrin in good yield but 2, 2, 6-trimethylcyclohexanone does not
- (ii) Benzaldehyde does not give Fehling's test
- (iii) The alpha H atoms in ethanal are acidic in nature

Q9 How will you convert 3

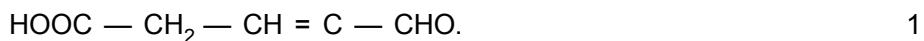
- (i) Isopropyl chloride to 2-methylpropanaldehyde
- (ii) Benzene to benzaldehyde
- (iii) Benzoic acid to acetophenone

Q10 Identify A, B, C, D and E in the following sequence of reaction : 5



3 Marks Questions

Q1 Write the IUPAC names of the following organic compound



Q2 Explain the following and give one example of a tautomer reaction. 1

Q3 Complete the following reaction 1



Q4 Explain the following reaction giving one example each: 2

(i) Aldol condensation

(ii) Cannizzaro

Q5 Explain the following reactions giving one example each 2

(i) Wolff-Kishner reduction

(ii) Haloform reaction

Q6 Give one chemical test to distinguish b/w following pair of compounds write the chemical reaction involved 2

(i) formic acid and acetic acid

(ii) Propanol and propan-1

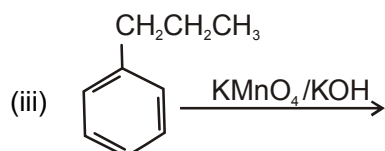
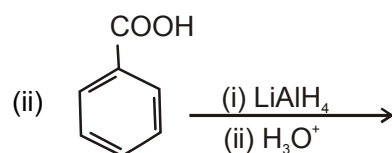
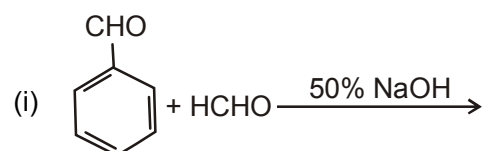
Q7 Give reason for the following 3

(i) chloroacetic acid has lower pka value than acetic acid

(ii) Monochloroethanoic acid is a weak acid than dichloroethanoic acid.

(iii) Benzoic acid is stronger acid than ethanoic acid

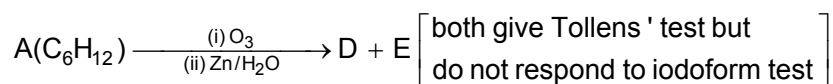
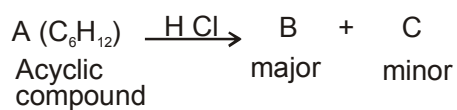
Q8 Complete the following reaction 3



Q9 How will you convert: 3

- (i) propene to propanol
- (ii) butanoic acid to 2-hydroxybutanoic acid
- (iii) Benzoic acid to m-nitrobenzyl alcohol

Q10 identify A, B, C, D and E in the following sequence of reactions: 5



Name _____

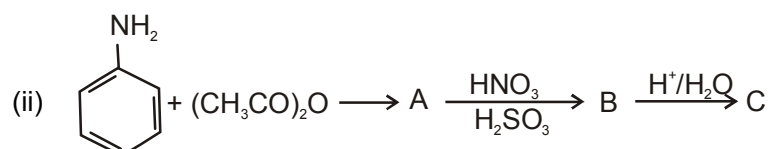
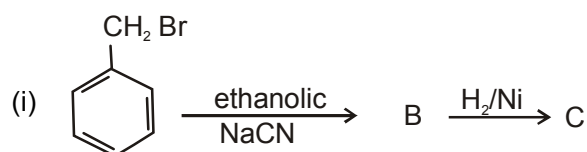
Roll No. _____

CLASS-XII — CHEMISTRY

WORKSHEET

AMINES

- Q1 Write IUPAC name of the following 1
- $$\begin{array}{c} \text{CH}_3 \text{ CH}_2 \text{CH} - \text{NH}_2 \\ | \\ \text{CH}_3 \end{array}$$
- Q2 How will you bring about the following conversion: 1
P-toluidine to 2 - Bromo - 4 - methylaniline.
- Q3 Explain why: 1
Methylamine in water reacts with ferric chloride to precipitate hydrated ferric oxide.
- Q4 Giving an example of each, describe the following reaction : 2
- (i) Coupling reaction
 - (ii) Carbylaminae reaction
- Q5 Describe the Hinsberg's test for identification of primary, secondary and tertiary amines. Also write the chemical equations of reaction involved 2
- Q6 Arrange the following in the increasing order of property indicated : 2
- (i) Aniline, P-toluidine, P-nitroaniline (Basic strength)
 - (ii) $\text{C}_2\text{H}_5\text{OH}$, $(\text{CH}_3)_2\text{NH}$, $\text{C}_2\text{H}_5\text{NH}_2$ (Boiling point)
- Q7 How will you bring about the following conversions: 3
- (i) benzene to Aniline
 - (ii) Aniline to benzene
 - (iii) ethanoic acid to ethanamine
- Q8 Identify the missing reagent/product in the following reactions. 3



Q9 Give one chemical test to distinguish b/w the following pairs of compound

- (i) Methylamine and dimethylamine
- (ii) Secondary and tertiary amines
- (iii) ethylamine and aniline

Q10 Explain why:

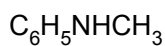
5

- (i) The C—N—C bond angle in trimethyl amine is 108°
- (ii) The quaternary ammonium salts having four different alkyl groups are optically active.
- (iii) Alkylamines are more basic than ammonia
- (iv) Aniline can not be prepared by Gabriel phthalimide synthesis.
- (v) Gabriel phthalimide synthesis is preferably used for synthesizing primary amines.

AMINES

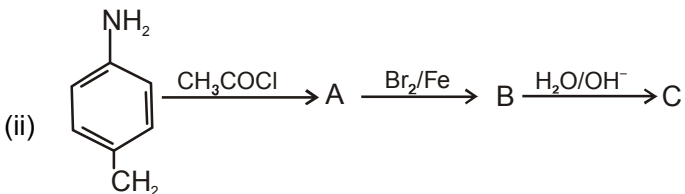
Q1 Write IUPAC name of the following:

1



Q2 How will you bring about the following conversion methylbromide to ethanamine.

1

- Q3 Explain why? 1
Although amino group is *O, P*-directing in aromatic electrophilic substitution reactions, on-line on nitration gives a substantial amount of *m*-nitroaniline.
- Q4 Giving an example of each, describe the following reactions. 2
(i) Hoffinan bromamide reaction.
(ii) Gabriel phthanlimide synthesis.
- Q5 Arrange the following in the increasing order of given property indicated. 2
(i) $C_2H_5NH_2$, $(C_2H_5)_2NH$, $(C_2H_5)_3N$ and NH_3 (Basic strength in aqueous solution)
(ii) $C_2H_5NH_2$, $(C_2H_5)_2NH$, $(C_2H_5)_3N$ and CH_3NH_2 (Basic strength in gaseous phase)
- Q6 Identify A and B in the following reaction: 2
(i) $CH_3CH_2Cl + NH_3$ (Excess) $\xrightarrow[OH^-]{373K}$ A
(ii) $CH_3CH_2Cl + NH_3$ $\xrightarrow[OH^-]{373K}$ (Excess)
- Q7 How will you bring about the conversions. 3
(i) benzenediazonium chloride to nitrobenzene.
(ii) ethylamine to methylanine.
(iii) benzene to sulphanilic acid.
- Q8 Identify the missing reagent/product in the following reactions. 3
(i) $C_6H_5NO_2 \xrightarrow{Fe/HCC} A \xrightarrow{H_2SO_4} B \xrightarrow{heat} C$
(ii) 

Q9 Give one chemical test to distinguish between the 3 following pairs of compounds.

- (i) methylamine and methanol
- (ii) methylamine and N, N-dimethylamine
- (iii) ethanol and itahnamine

Q10 Explain why: 5

- (i) ithylamine is soluble in water but aniline is not
- (ii) Amines are soluble indilute HCl.
- (iii) Amines have lower boiling point thawaleohols of comparable molecular masses
- (iv) 1° amines have higher boiling points than 2° amines which in turn, are higher boiling than 3° amines
- (v) The PK_b value of benzeneamine is 9.33 while that of ammonia is 4.75.

Name _____

Roll No. _____

CLASS-XII — CHEMISTRY

WORKSHEET

BIOMOLECULES

- Q1 Name polysaccharide which is stored in the liver of animals. 1
- Q2 How will you explain the amphoteric behaviour of amino acids. 1
- Q3 What is the difference b/w an oligosaccharide and a polysaccharide. 1
- Q4 What are anomers. Give the structure of two anomers of glucose. 2
- Q5 What are essential and non essential amino acids. Give one example of each type. 2
- Q6 Explain what is meant by:
(i) a peptide linkage (ii) a glycosidic linkage 2
- Q7 (i) Give the significance of prefix 'D' in the name D-(+)- glucose.
(ii) Glucose is an aldose sugar but it does not react with sodium hydrogen sulphite. Give reason
(iii) Why is sucrose called invert sugar?
- Q8 (i) Name the two components of starch? Which one is water soluble
(ii) What are hydrolysis products of (i) maltose, (ii) cellulose.
- Q9 What do you understand by: 3
(a) denaturation of protein
(b) specificity of an enzyme
- Q10 How are carbohydrates classified 5
(i) Name four bases present in DNA
(ii) Which of them is not present in RNA
(iii) Give the structure of a nucleotide of DNA

BIOMOLECULES

- Q1 Write the Zwitter ionic of aminoacitic acid. 1
- Q2 What type of linkage holds together the monomers of DNA and RNA. 1
- Q3 Give the Haworth projection of D-gluco pyranose. 1
- Q4 State two main differences between globular and fibrous proteins 2
- Q5 Name four type of intermolecular forces which stabilize 2° and 3° structure of proteins.
- Q6 (i) Name the disease caused by deficiency of Vitamin D
(ii) Why cannot Vitamin C be stored in our body
- Q7 (i) How are polypeptides different protein 3
(ii) Which nucleic acid is responsible for carrying out protein synthesis in the cell.
(iii) The two strands in DNA are not identical but complimentary, Explain.
- Q8 (i) Acetylation of glucose with acetic anhydride gives glucose pentaacetate. Write the structural of the pentaacetate. 3
(ii) Explain why glucose pentaacetate does not react with hydronylamine?
- Q9 Mention deficiency disease of Vit A, B₁₂, D, E, K, B₆, 3
- Q10 Differentiate between the following 5
(i) Secondary and tertiary structure of protein
(ii) α -Helix and β -pleated sheet structure of protein
(iii) Fibrous and galbular proteins

Name _____

Roll No. _____

CLASS-XII — CHEMISTRY

WORKSHEET

POLYMERS

- Q1 Define terms co-polymer. 1
- Q2 Classify polythene and bakelite as thermosetting plastics or Hemoplastics.
- Q3 What do the digits 6 and 66 represent in the names nylon -6 and nylon e-66?
- Q4 Which of the following sets has all polymers capable of repeatedly softening on heating and hardening on Cooling? 2
- (i) Glyptal, Melamine, PAN
 - (ii) PVC, Polystyrene, Polythene
 - (iii) Polypropylene, urea formaldehyde resin, teblon
- Q5 Classify the following as homopolymer or co-polymer. Also classify them as addition or condensation polymers
- (i) $-(\text{NHCH}(\text{R})\text{CO})_n^-$
 - (ii) $-(\text{CH}_2 - \text{CH} = \text{CH} - \text{CH}_2 - \underset{\text{C}_2\text{H}_5}{\text{CH}} - \text{CH}_2)_n$
- Q6 How can you differentiate b/w thermosetting and thermoplastic polymers.
- Q7 (i) What is the difference b/w step growth polymer and Chain growth polymer? 3
- (ii) Give one example of each type.
- Q8 Write the expanded formula and give the structures of monomers for the following polymers; 3

- (i) PAN (ii) PTFE (iii) PVC
- Q9 Write the structure of the monomers used in the synthesis of: 3
- (i) Nylon-6 (ii) Nylon-6, 6 (iii) Nylon-6, 10
- Q10 Atleast two uses each of the following polymers : 5
- (i) Nylon-2-Nylon-6, (ii) Urea-formaldehyde resin, (iii) 6 lyptal
- (ii) What is meant by briodegradable polymers?

POLYMERS

- Q1 Identify homopolymer from the following examples nylon-66, Nylon-6, Nylon-2-Nylon-6 1
- Q2 How is vulcanized rubber obtained. 1
- Q3 Write the full form of PHBV 1
- Q4 Give the structure of monomer of neoprene. What is the advantage of enoprene over the natural rubber? 2
- Q5 Give the mechanism of polymerisation of ethane to polythene in presence of benzoyl peroxide. 2
- Q6 Arrange the following polymers in order of increasing intermolecular forces.
- (i) Nylon-6, 6, Buna-S, polythene
- (ii) Nylon-6, Neoprene, polyvinylchloride.
- Q7 Identify the polymer whose structure are given and mention one of their important use: 3
- (i) $\text{-(Co - (CH}_2\text{)}_5\text{ - NH)}_n\text{-}$
- (ii) $\text{-(CH}_2\text{ - CH)}_n\text{-}$
- Q8 Write the structure of following polymers and also give their main uses:
- (a) Polystyrene

(b) Melamine-formaldehyde resin

(c) Buna-N

Q9 Differentiate between the following pairs:

3

(i) Branched chain polymers and cross linked polymers

(ii) Thermoplastic and thermosetting polymers

(iii) Addition and Condensation polymers.

Q10 Write the name and formula of the following polymers

(a) PHBV

(b) Buna-S

(c) Nylon 6

(d) Terylene

(e) Bakelite

Name _____

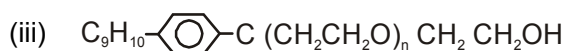
Roll No. _____

CLASS-XII — CHEMISTRY

WORKSHEET

CHEMISTRY IN EVERYDAY LIFE

- Q1 What is the role of Bithional in toilet soaps? 1
- Q2 Name the antiseptic agents present in dettol. 1
- Q3 Name a chemical used as an antiseptic as well as disinfectant. 1
- Q4 Give one important use of each of following: 2
- (i) Equanil (ii) Morphie.
- Q5 (i) What are antibiotics? 2
- (ii) What is meant by the term broad spectrum antibiotic?
- Q6 What do you mean by non-biodegradable detergents? How can we make biodegradable detergents. 2
- Q7 (i) Why are artificial sweetening agents harmless when taken? 3
- (ii) Name one such artificial sweetening agent.
- (iii) Why is the use of aspartame as an artificial sweetener limited to cold foods?
- Q8 Give the pharmacological function of the following types of drugs: 3
- (a) Analgesics
- (b) Tranquilizers
- (c) antifertility drugs.
- Q9 Classify the following as cationic detergents, anionic detergents or non-ionic detergents; 3.
- (i) $\text{CH}_3(\text{CH}_2)_{10}\text{CH}_2\text{OSO}_3^- \text{Na}^+$
- (ii) $[\text{CH}_3 - (\text{CH}_2)_{15}\text{N}(\text{CH}_3)_3]^+ \text{Br}^-$



- Q10
- (i) Why synthetic detergents are preferred over soaps for use in washing machines
 - (ii) What type of drug chlorampainicol
 - (iii) What are antihistamines. Give two examples
 - (iv) What are narcotic and non-narcotic analgesies? Give one example of each.
 - (v) State the main difference b/w bacteriostatic and bacteriocidal antibiotics. Give one example of each.

CHEMISTRY IN EVERYDAY LIFE

- Q1 Give the composition of tincture of iodine. 1
- Q2 Explain why aspirin finds use in preventing /prevention of heart attacks? 1
- Q3 Give two examples of antidepressants. 1
- Q4 What are neurologically active drugs? Give two examples. 2
- Q5 Why a drug should not be taken without consulting a doctor? Give two reasons. 2.
- Q6 Write the structure of soaps obtained by the hydrolysis of following esters:
- (i) $(C_{15}H_{31}COO)_3C_3H_5$ Glycerol Palmitate
 - (ii) $(C_{17}H_{33}COO)_3C_3H_5$ Glycerol oleate.
- Q7 Pick out the odd one amongst the following on the basis their medicinal properties. Give suitable reason 3
- (i) Luminal, seconal, terfenadine Equiril
 - (ii) Chloroform, phenol, Chloramphenicol, bithional
 - (iii) Sucralose, aspartame, alitame, sodium benzoate
- Q8 Explain the following terms with suitable examples. 3
- (i) Cationic detergents

- (ii) Non ionic detergents
 - (iii) Anionic detergents
- Q9 Define 3
- (i) Hormones
 - (ii) Broad spectrum antibiotics
 - (iii) Tranquilizers
- Q10 (i) Mention one use of drug meprobamate. 5
- (ii) What are antifertility drugs? Name the constituent of oral contraceptive.
 - (iii) Give the main function of following in the body of human beings:
 - (a) Enzymes
 - (b) Receptor proteins
 - (c) Neurotransmitter

WORKSHEET

CHEMISTRY

CLASS - XII

Submitted by :

R.A. VERMA, *Principal*

G.B.S.S.S. No. 1, Shakti Nagar, Delhi

MUKESH KUMAR KAUSHIK

PPVV, Narela

RAVINDER KUMAR MALIK

SBV, Narela