

**KENDRIYA VIDYALAYA NO 2 AFS HINDAN
SUMMER VACATION HOMEWORK
CLASS- XIIB**

Class 12 English

- A) Complete the Notebook Work with Index and paste the CBSE Question Paper Pattern given already.**
- B) Write 4 questions of Notice Writing (choose among various topics related to school like competition, workshop, career counseling etc.)**
- C) Write 4 questions of Article Writing**
 - A) Importance of Mental Health Awareness**
 - B) Drug Abuse Among Youth**
 - C) Importance of Skill-Based Education**
 - D) Sustainable Living for a Better Tomorrow**
- D) Important questions from ' The Third Level'**
 - A) How does the psychiatrist interpret Charley's claim of the third level?**
 - B) What does the third level symbolize in the story?**
 - C) Why is the year 1894 significant in the story?**
 - D) What is the irony in Sam's role as a psychiatrist?**
 - E) Why was Charley unable to buy tickets to Galesburg at the Third Level?**
 - F) What does the phrase "waking-dream wish fulfillment" reveal about Charley's mental state?**
 - G) How is Galesburg described by Charley, and what does this reveal about his inner desires?**

PHYSICS HOLIDAY HOME WORK XII (2026-27)

BEFORE STARTING HOLIDAY HOME WORK, READ ALL INSTRUCTIONS CAREFULLY.

Instructions :

1. Holiday Home Work should be neat and clean and do in HW Register.
2. Do not forget to write units at proper places and in answer. You can hope to get full marks in numericals only if units are given both data and with answer.
3. Use pencil for figures and diagram.

Questions:

- Q1. Assignment based on Unit –I ELECTROSTATICS (attached below).
- Q2. NCERT Questions of Ch-1 and Ch-2, both solved and unsolved in home work register.
- Q3. Download last ten years board questions papers form CBSE website and make a file of it. And Do questions from Unit –I ELECTROSTATES.
- Q4: Prepare one investigatory Project according to Syllabus and CBSE

ASSIGNMENT: ELECTROSTATICS AND CURRENT ELECTRICITY

NUMERICALS

1. Estimate the total number of electrons present in 100g of water. How much is the total negative charge carried by these electrons? Avogadro's number = 6.023×10^{23} and molecular mass of water = 18u.

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(Ans = 5.35×10^6 C)

2. It is now believe that protons and neutrons are themselves built out of more elementary units called quarks. A proton and neutrons consists of three quarks each. Two types of quarks, the so called up quarks (u) of charge $(+2/3)e$ and down quarks (d) of charge $(-1/3)e$, together with electrons build up ordinary matter. Suggest a possible quark composition of a proton and neutron.

(Ans= uud, udd)

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3. A free pith ball A of 8g carries a positive charge of 5×10^{-8} C. What must be the nature and magnitude of charge that should be given to a second pith ball B fixed 5cm below the former ball so that the upper ball is stationary. (Ans= 4.36×10^{-7} , repulsive)

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4. A particle of mass m and carrying charge $-q_1$ is moving around a charge $+q_2$ along a circular path of radius r. Prove that the period of revolution of the charge $-q_1$

about $+q_2$ is given by

$$T = \sqrt{\frac{16\pi^2 r^3}{\epsilon_0 q_1 q_2}}$$

$q_1 q_2$

5. Two identical charges, Q each are kept at a distance r from each other. A third charge q is placed on the line joining above two charges such that all the three charges are in equilibrium. What is the magnitude, sign and position of the charge q?
(Ans : $Q=q/4$, opposite, $x=r/2$)

VERY SHORT ANSWER QUESTIONS

- Define the term electric dipole moment.
- Sketch the electric field lines due to two equal positive charges placed near each other.
- Give the units of i) line integral of electric field and ii) surface integral of electric field.
- What would be the work done if a point charge $+q$, is taken from a point A to B on the circumference of a circle drawn with another point charge $+q$ at the centre.
- An uncharged insulated conductor A is brought near a charged insulated conductor B. What happens to charge and potential of B?
- Why does the electric field inside a dielectric decrease when it is placed in an external field?
- In a parallel plate capacitor, the capacitance increases from $4\mu\text{f}$ to $80\mu\text{f}$, on introducing a dielectric medium between the plates. What is the dielectric constant of the medium?

SHORT ANSWER QUESTIONS

13. Derive an expression for the electric field intensity at any point along the axial line of an electric dipole.
14. Two point electric charges of unknown magnitude and sign are placed a distance 'd' apart. The electric field intensity is zero at a point, not between the charges but on the line joining them. Write two essential conditions for this to happen.
15. Derive an expression for the energy stored in a parallel plate capacitor with air as the medium between its plates.
16. Find the ratio of linear momenta acquired by a α -particle and a proton accelerated through the same potential.
17. Using Gauss's law, show that no electric field intensity exists inside a hollow charged conductor.
18. An electric dipole is free to move in a uniform electric field. Explain its motion when it is placed i) parallel to the field and ii) perpendicular to the field.
19. Calculate the distance between two protons such that the electrostatics repulsive force between them is equal to the weight of either.
20. Two point charges q and 2q are kept at a distance d apart from each other in air. A third charge Q is to be kept along the same line in such a way that the net force on q and 2q is zero. Calculate the position of Q in terms of q and d.
21. An electric flux of $-6 \times 10^3 \text{ NM}^2/\text{C}$ passes normally through a spherical Gaussian surface radius 10cm, due to point charge placed at the centre. What is the charge enclosed by the Gaussian surface? If the radius of Gaussian surface is doubled, how much flux would pass through the surface?
22. Is electric flux a scalar or vector quantity? Give its SI units.
23. (i) A charge of 2micro coulomb is placed at the center of a sphere of radius 1m. What is the electric flux passing through sphere if another charge of -2microcoulomb is placed at a distance of
(a) 0.5m
(b) 1.5m from its center.
24. Two equal charges each of $-\sqrt{2}\mu\text{C}$ are placed 2m apart and a third charge $2\sqrt{2}\mu\text{C}$ is placed at mid point of line joining them. Calculate total electric field intensity at a distance of 1m from third charge on perpendicular bisector of the line joining the charges.
25. An electric dipole is held in a uniform electric field.
(a) Show that no translatory force acts on it.
(b) Derive an expression for the torque acting on it.

Subject Teacher

SUBJECT - CHEMISTRY

Solve these important questions in A4 sheets

SOLUTIONS

Q.1 4L of 0.02M aqueous solution of NaCl was diluted by adding one litre of water. The molality of the resultant solution is

(a) 0.004 (b) 0.008

(c) 0.012 (d) 0.016

Q.2 The value of Henry's constant K_H is:

(a) greater for gases with higher solubility (b) greater for gases with lower solubility.

(c) constant for all gases. (d) not related to the solubility of gases

Q.3 What is the mole fraction of ethylene glycol in a solution containing 20g by mass?

(a) 0.022 (b) 0.054

(c) 0.068 (d) 0.090

Q.4 The solubility of a substance in a solvent depends on

(a) Temperature (b) Pressure

(c) Nature of solute and solvent (d) All of the above

Q. 5 Which of the following does not dissolve in benzene?

(a) Naphthalene (b) Anthracite

(c) $C_6H_{12}O_6$ (d) All of the above

Q.6 Choose the ideal solution from the following.

(a) Carbon disulphide and acetone (b) Phenol and Aniline

(c) Chloroform and Acetone (d) Ethyl iodide and ethyl bromide

Q.7 How does the solubility of gases vary with pressure?

(a) Increases with pressure (b) Decreases with pressure

(c) First increases and then decreases (d) No effect

Q.8 How does the solubility of gases in a liquid vary with increase in temperature?

(a) Increases with temperature (b) Decreases with temperature

(c) First increases and then decreases (d) No effect

Q.9 Increasing the temperature of an aqueous solution will cause:

(a) increase in molality (b) decrease in molality

(c) decrease in mole fraction (d) decrease in % (w/w)

Q.10 Which of the following condition is not satisfied by an ideal solution?

(a) $\Delta H_{\text{mixing}} = 0$ (b) $\Delta V_{\text{mixing}} = 0$

(c) Raoult's Law is obeyed (d) Formation of an azeotropic mixture

Given below are two statements labelled as Assertion (A) and Reason (R) Select the most appropriate answer from the options given below:

Both A and R are true and R is the correct explanation of A

Both A and R are true but R is not the correct explanation of A

A is true but R is false

A is false but R is true

1. Assertion: Molarity of a solution in liquid state changes with temperature.

Reason: The volume of a solution changes with change in temperature

2. Assertion: When NaCl is added to water a depression in freezing point is observed.

Reason: The lowering of vapour pressure of a solution causes depression in the freezing point.

3. Assertion: When a solution is separated from the pure solvent by a semipermeable membrane, the solvent molecules pass through it from pure solvent side to the solution side.

Reason: Diffusion of solvent occurs from a region of high concentration solution to a region of low concentration solution.

4. Assertion: Molecular mass of polymers cannot be calculated using boiling point or freezing point methods. Reason: Polymers solution do not possess a constant boiling point or freezing point.

5. Assertion: Non-ideal solutions always form azeotropes.

Reason: Boiling point of azeotrope may be higher or lower than boiling points of both components.

Q11 Calculate the mole fraction of ethylene glycol ($\text{C}_2\text{H}_6\text{O}_2$) in a solution containing 20% of $\text{C}_2\text{H}_6\text{O}_2$ by mass.

Q12 . Calculate (a) molality (b) molarity and (c) mole fraction of KI if the density of 20% (mass/mass) aqueous KI is 1.202 g mL^{-1} .

Q13. The vapour pressure of pure benzene at a certain temperature is 0.850 bar. A non-volatile, non-electrolyte solid weighing 0.5 g when added to 39.0 g of benzene (molar mass 78 g mol^{-1}). Vapour pressure of the solution, then, is 0.845 bar. What is the molar mass of the solid substance?

Q14. 2g of benzoic acid ($\text{C}_6\text{H}_5\text{COOH}$) dissolved in 25 g of benzene shows a depression in freezing point equal to 1.62 K. Molal depression constant for benzene is $4.9 \text{ K kg mol}^{-1}$. What is the percentage association of acid if it forms dimer in solution?

Q15. Give reason for followings

- (a) Why are aquatic species more comfortable in cold water than in warm water?
- (b) Deep sea divers are advised not to come to surface immediately from deep waters. Why?
- (c) Cooking is faster in pressure cooker than in cooking pan
- (d) Two liquids A and B boil at 120°C and 160°C respectively. Which of them has higher vapour pressure at 70°C ?
- (e) Name the substances which are used by deep sea divers to neutralize the toxic effects of nitrogen dissolved in the blood.

ELECTROCHEMISTRY

Q1 What is limiting molar conductivity ? Write its unit.(1)

Q2 Why Is it safe to stir AgNO_3 solution with a copper spoon? (1)

$E^\circ(\text{Ag}^+/\text{Ag}) = 0.80 \text{ Volt}$; $E^\circ(\text{Cu}^{2+}/\text{Cu}) = 0.34 \text{ Volt}$

Q3 Why does the conductivity of a solution decrease with dilution? (1)

Q4. Write the Nernst equation for the cell at 298 K: $\text{Mg(s)}|\text{Mg}^{2+}||\text{Cu}^{2+}|\text{Cu(s)}$ (1)

Q5. Write the reactions taking place at anode and cathode of fuel cell and write two uses of fuel cell (2)

Q6. From the given cells: Lead storage cell, Mercury cell, Fuel cell and Dry cell Answer the following: (i) Which cell is used in hearing aids? (ii) Which cell was used in Apollo Space Programme?(2)

Q7.Consider a cell given below

$\text{Cu} | \text{Cu}^{2+} || \text{Cl}^- | \text{Cl}_2, \text{Pt}$

Write the reaction that occurs at anode and cathode. (2)

Q8.(a)The molar conductivity of a 1.5 M solution of an electrolyte is found to be $138.9 \text{ S cm}^2 \text{ mol}^{-1}$. Calculate the conductivity of the solution.

(b) What flows in the internal circuit of a galvanic cell? (3)

Q9. A cell has 2 hydrogen electrodes where the negative electrode comes in contact with a solution containing 10^{-6} H^+ ions. The cell EMF is denoted as 0.118 V at 298 K. Find the concentration of the H^+ ions during the positive electrode.

Q10. How will the pH of brine (NaCl solution) be affected when it is electrolysed?

Q11. (a) Why on dilution the Δ_m of CH_3COOH increase drastically, while that of CH_3COONa increase gradually?

(b) Write down the mechanism of rusting of iron. (3)

Q12. Write the name of the cell which is generally used in inverters. Write the reactions taking place at the anode and the cathode of this cell. (3)

Q13. Define molar conductivity of a solution and explain how molar conductivity changes with change in concentration of solution for a weak and a strong electrolyte. (3)

Q14. (a) What is the relation between conductivity and cell constant?

(b) What is the relation between Gibbs energy change and emf?

(c) What is the relation between Emf and equilibrium constant? (3)

Q15. (a) Why does a cell stop working after some time?

(b) What is the function of salt bridge?

(c) What will happen if the external emf applied is greater than emf of the cell? (3)

Q16. A cathode and an anode are the most common components of an electrochemical cell. Which of the following claims about the cathode is correct? (1)

a) Oxidation occurs at the cathode

b) Electrons move into the cathode

c) Usually denoted by a negative sign

d) Is usually made up of insulating material

Q17. Which of the following condition is not satisfied by an ideal solution? (a) $\Delta H_{\text{mixing}} = 0$ (b) $\Delta V_{\text{mixing}} = 0$ (c) Raoult's Law is obeyed (d) Formation of an azeotropic mixture (1)

Q18. The charge required for the reduction of 1 mol of MnO_4^- to MnO_2 is a. 1 F b. 3 F c. 5 F d. 6 F (1)