Shri Guru Teg Bahadur Sen. Sec. School
Hassanpura (Gokhuwal) Batala
Chemistry
Assignment -1

Instructions

- Revised syllabus of chapter covered in Month of April May 2025. (i) Chapter 1: Solution (ii) Chapter 2: Electro Chemistry
- The Assignment consists of 30 MARKS out of which, 10 MARKS will be allotted for the PROJECT
- FILE (Decorated Cover) and 5 Marks Neat and Clean Handwriting & the remaining 15 MARKS for the whole content based on the file.
- Use Pencil for Diagrams, Sketch, Sparkle Pen Colourful etc.
- Complete your Class Notes till 05/07/2025 on the notebook.
- Write the whole Content on the Decorated Assignment with colourful Pages.
- Handwriting Should Be Neat and Clean.
- Questions are compulsory to write on the assignment.
- Make a Index page in the assignment.
- Each and every Question is compulsory to Attempt.
- All the students take help any kind of books, YouTube or Internet.

All students will prepare a presentation on any one of the following topics from the syllabus completed.

1) he presentation duration should range from 7 to 10 minutes.
2) The PPT should ideally have 15-20 slides, but can be expanded further if necessary.
3) All students will present their PowerPoint presentations in class after the summer vacation, as per the teacher's schedule Topics are given below :-

i) Solutions and their Types
ii) Expression of concentration of solution of solids in liquids
iii) Colligative properties – Relative lowering in vapor pressure
iv) Depression in freezing point
v) Osmotic pressure

vi) Redox reaction and emf of a cell
vii) Nernst equation and its applications
viii) Conductance of a electrolytic solution, specific and molar conductivity
ix) Kohlrauch's law
x) Primary and secondary cells

4. **CREATE AN INNOVATIVE 3D MODEL FOR SCIENCE EXHIBITION:**
Develop a working model that addresses a current societal or environmental issue, ensuring cost-effectiveness, eco-friendliness, and no side effects.
5. **ASSIGNMENT: HIGHER-ORDER THINKING QUESTIONS:**
- Students will create 10 multiple-choice questions and 5 subjective questions based on the bimonthly syllabus.
- Questions should be original and not copied from other sources.
- Teachers will assign specific topics/chapters to each student.
- Students will submit their questions along with an answer key.

Assignment 1 Submission Dated: 05/07/2025.

MULTIPLE CHOICE QUESTIONS :

1. Which of the following aqueous solutions should have the highest boiling point?
(a)1.0 M NaOH (b) 1.0M Na_2SO_4 (c) 1.0 M NH_4NO_3 (d) 1.0 M KNO_2
2. The Unit of ebulioscopic constant is……...
(a) K kg mol^{-1} (b) Mol Kg K (c) Kg $mol^{-1}K^{-1}$ (d) K mol Kg^{-1}
3. The Values of Van't Hoff factors for KCI, NaCl and K_2SO_4 respectively, are ……
(a) 2, 2 and 2 (*b*) 2, 2 and 3 (*c*) 1, 1 and 2 (*d*) 1, 1 and 1
4. Value of Henry's constant K_H is
(a) Greater for gases with higher solubility (c) Constant for all gases
(b) Greater for gases with higher solubility (d) not related to the solubility of gases
5. A colligative property of a solution depends on the
(a) Number of solute particles (c) Total number of solute and solvent molecules
(b) Number of atoms in solute molecules (d) mass of solute particles
6. Colligative property of a solution depends on
(a) Molarity (c) Number of moles of solvent
(b) Number of moles of solute (d) Nature of solute
7. Which of the following solutions will have the least freezing point?
(a) 0.1M Urea (b) 0.1M Acetic acid (c) 0.1M NaCl (d) 0.1 m Calcium Chloride
8. A semipermeable membrane permits the flow of
(a) Solution (b) Solvent (c) Solute (d) Neither solute nor solvent
9. The decreasing order of osmotic pressure of 10g glucose(P1) , 10g Urea(P2) and 10g sucrose(P3) at 273K, when dissolved in 400 mL of water separately is.

(a) P1> P2> P3(b) P2> P3> P1 (c) P3> P2> P1 (d) P2> P1>P3

10. Molarity of 900g of pure water is

(a) 50M (*b*) 55.5M (*c*) 5M (*d*) None of these

11. Mole fraction of a solute in 2.5m aqueous solution is

(a) 0.43 (b) 0.043 (c) 4.3 (d) 43

12. A $H_2 SO_4$ solution contains 80.0% by weight H_2SO_4 and has a specific gravity of 1.73, its normality is approximately?

(a) 18.0 (b) 1.8 (c) 28.2 (d) 36.0

13. On dissolving common salt in water, the:

(a) freezing point of H_2O increases (c) boiling point of H_2O decreases

(b) boiling point of H_2O decreases (d) boiling point of H_2O remain same

14. The unit of ebullioscopic constant is

(a) K kg mol^{-1} (b) Mol Kg K^{-1}(c) K mol Kg^{-1} (d) none of these

15. An aqueous solution of methanol in water has vapour pressure

(a) equal to that of methanol (c) more than that of water

(b) equal to that of water (d) less than that of water

16. The molality of pure water is

(a) 55.5 (b) 20 (c)18 (d)10

17. The number of moles of NaCI in 3litres of 3M solution is:

(a) 1 (b) 3 (c) 9 (d) 27

18. The amount of solute required to prepare 10 litres of decimolar solution is:

(a) 0.01mole (b) 0.2 mole (c)0.05mole (d)1.0mole

19. One kilogram of water contains 4g of NaOH. The concentration of the solution is best expressed as:

(a)0.1molal (b)0.1 molar (c)decinormal (d)about0.1mole.

20. The number of moles of NaCl in 3 litres of 3M solution is:

(a) 1 (b) 3 (c) 9 (d) 27

21. Molality is expressed in:

(a) Gram/litre (b) mole/litre (c) litre/mole (d) mole/kg

22. Which of the not affected by temperature?

(a) Normality (b) Molality (c) Molarity (d) Formality

23. Isotonic solution have equal

(a) vapour pressure (b) osmotic pressure (c) boiling point (d) freezing point

24. The molal elevation constant depends upon

(a) nature of solute (b)nature of the solvent

(c) vapour pressure of the solution (d)enthalpy change

25. Molarity is expressed as

(a)L/mol (b)mol/L (c)mol/1000g (d)g/L

26. Which of the following is a colligative property?

(a) vapour pressure (*b*) relative lowering in vapour pressure

(*c*) lowering in vapor pressure (*d*) all of these

27. Which one of the following binary liquid mixtures exhibits negative deviation from Raoult's law?

(a) *n*-Hexane-*n*-Heptane (*b*) Chloroform−Acetone

(*c*) Carbondisulphide−Acetone (*d*) Bromoethane−Chloroethene

28. Constant boiling mixtures are called
(a) ideal solution (*b*) Azeotropes
(*c*) isotonic solution (*d*)None of these.
29. Pressure cooker reduces cooking time because
(a) heat is more evenly distributed.
(b) the high pressure tends to rise the food
(c) the boiling point of food under pressure is elevated
(d) the boiling point of water in cooker is depressed.
30. Camphor is often used in molecular mass determination because.
(a) it has a high Cryoscopy constant (c) it is solvent for organic substance
(b) it is volatile (d) it is readily available

Two Or Three Marks Questions

1. A commercially available sample of sulphuric acid is 15% H_2SO_4 by weight (density = 1.10 g ml) □1 Calculate Molarity. *Ans. 1.68M$^+$

2. A commercially available sample of sulphuric acid is 38% HCl by weight (density = 1.19 g ml) □1 Calculate Molarity of acid. *Ans. 12.39M$^+$

3. Calculate the mole fraction of ethanol and water in a sample which contain 95% ethanol by mass? *Ans. X ethanol=0.88, X water l=0.12

4. 2.82 g of glucose (molar mas = 180) is dissolved in 30g of water. Calculate mole fraction of glucose and water. * Ans. X glucose = 0.0093, X water = 0.9907+

5. A sugar syrup of weight 214.2 g contains 34.2 g of sugar($C_{12}H_{22}O_{11}$). Calculate the mole fraction of sugar in the syrup. *Ans. X sugar=0.01+

6. The osmotic pressure in pascal exerted by a solution prepared by dissolving 1.0 g of polymer of molar mass 185000 in 450 ml of water at 37ºC. *Ans.1.43M+

7. Calculate the molal elevation constant of water, it is given that the 0.1 molal aqueous solutions of the substance boiled at 100.052 degree celcius.*Ans. Kb=0.52 Km-1+

8. Addition of 0.643 g of a compound to 50 mL of benzene (density 0.879 g/mL) lowers the freezing point from 5.51º C to 5.03º C. If K_f for benzene is 5.12, calculate the molecular mass of the compound. [Ans.M=155.87g/mol]

9. The boiling point of benzene is 353.23K. When 1.80g of a non-volatile non-ionisation solute was dissolved in 90g of benzene, the boiling point raised to 354.11K. Calculate the molar mass of the solute. *K_b for benzene =2.53K Kg mol−1+. *Ans. M=57.5g/mol+

10. A 45 g of ethylene glycol ($C_2H_6O_2$) is mixed with 600 g of water. What is the freezing point of the solution? k_f=1.86 K kg mol−1. *Ans.-2.25º C or 270.9K+

Two Marks Theory Question

1. Define colligative properties?
2. What is molal elevation constant or ebullioscopic constant and cryoscopic constant?
3. What is osmosis and diffusion?
4. What is Van't Hoff factor?
5. Write down the factors affecting the solubility of a solid in liquid.
6. What are the factors affecting the solubility of gas in liquid?
7. Why the vapour pressure of a solution decrease when non-volatile solute is added into it?
8. What are the conditions to get accurate value of Molar mass from Colligative Properties?
9. Define degree of dissociation and association?
10. Which colligative property is preferred to measure molar mass.?

Chapter Electro Chemistry One Marks MCQ

1. The electrode potential of SHE is fixed as
(a) 0.34V (b) —0.44V (c) 0.0V (d) —0.76V

2. The unit of molar conductivity is
(a) Scm^2mol^{-1} (b) Scm^2 mol (c) Scm^2mol (d) Scm^2gmol^{-1}

3. The number of Faradays required to reduce 1 mole of Cu^{2+} to metallic copper is
(a) One (*b*) two (*c*) three (*d*) four

4. While charging the lead storage battery
(a) $PbSO_4$ anode is reduced to Pb (c) $PbSO_4$ cathode is oxidized to Pb
(b) $PbSO_4$ cathode is reduced to Pb (d) $PbSO_4$ anode is oxidized to PbO

5. Electrode potential is the potential difference that develops on the
(a) Electrodes (*b*) Electrolyte (*c*) Electrode and its electrolyte (*d*) All.

6. Name the cell which was used in Apollo space programme.
(a) Fuel cell (b) Nickel cadmium cell (c) Mercury cell (d) Dry cell

7. Galvanic cells are also named as :
(a) electrolytic cells (b) battery cells (c) Daniel cells (d) John's cells

8. A substance with higher reduction potential value means that it is
(a) Weak reducing agent (*b*) Good reducing agent. (*c*) Good oxidizing agent.(*d*) Both (*b*) and (*c*)

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

10. Reduction reaction means :
a process of adding oxygen a process of removing hydrogen
process of adding electron a process of removing electrons

11. Cell constant and specific conductance is related to one another as : (a)Cell Constant = Conductance × Specific Conductance
(b) Conductance = Cell Constant × Specific Conductance

(c) Specific Conductance = Conductance × Cell Constant
(d) Cell Constant = Conductance/Specific Conductance

12. Rusting of iron is quicker in
(a) Saline water (*b*) Ordinary water (*c*) Distilled water (*d*) All of these

13. If a solution has a resistance of 25 Ω, its conductance is :
(a) 0.04 mho (b) 1/25 Ω (c) None of these(d) Both a and b

14. The time required to liberate 1gm equivalent of an element by passing 1A current through its solution is
(a) 6.7 hours (*b*) 13.4 hours (*c*) 19.9 hours (*d*) 26.8 hours

15. Rusting is process which is
(a) Chemical (*b*) Mechanical (*c*) Physical (*d*) All of the above

16. Unit of cell constant
(a) ohm cm (*b*) cm^{-1} (*c*) mol (*d*) no unit

17. The process used to deposit one metal over another metal is called
(a) Electrolysis (*b*) Electroplating (*c*) Carbon plating (*d*)None of above

18. The emf of the cell: Ni / Ni^{2+} (1.0 M) // Au^{3+} (1.0 M) / Au (E^o = − 0.25 V for Ni^{2+} / Ni and E^o = 1.5 V for Au^{3+} /Au) is
(a) 1.25 V (*b*) − 1.25 V (*c*) 1.75 V (*d*) 2.0 V

19. Kohlrausch's law is applicable:
(a) To electrolytes dissolved in a solvent of low polarity only
(b) To electrolytes at temperature above room temperature
(c) To electrolytic solution at infinite dilution
(d) To aqueous solution of strong electrolyte

20. E^o of three metals A, B, C are −1.4 V, + 0.6 V, − 3.4 V respectively. The reducing power of these metals are in order :
(a) A>B>C (b) B>C>A (c) B>A>C (d) C>A>B

21. Corrosion can be prevented by (a) Alloying(*b*) Tinning (*c*) Galvanizing (*d*) All of above

Two- Or Three-Marks Numerical Questions

1. **Calculate the maximum work that can be obtained from the Daniel cells : Zn l Zn2+ (aq) ‖Cu2+ (aq) l Cu Given : Eo (Zn^{2+} | Zn) = – 0.76 V, Eo (Cu^{2+} |Cu) = 0.34 V. *Ans.△ G= – 212300 CV+**
2. **The resistance of 0.5 N solution of an electrolyte in a conductivity cell is found to be 25 Ohm. Calculate equivalent conductivity of the solution of which the cell are 1.6 cm apart and have an area is 3.22 cm . * Ans: ʌeq = 40 ohm-1 cm2 eq-1 +**
3. **The resistance of 0.5 M solution of an electrolyte enclosed between two platinum electrons 1.5 cm apart and having area of 22cm was fond to be 30 Ohm. Find Molar conductivity of solution. * Ans. ʌm = 50 ohm-1 cm2eq-1 +**
4. **Calculate the maximum work that can be obtained from the Daniel cells :**
5. **Zn l Zn2+ (aq) ‖Cu2+ (aq) l Cu Given : Eo (Zn^{2+} | Zn) = – 0.76 V, Eo (Cu^{2+} |Cu)= 0.34 V *Ans.□G□= – 212300 CV+**

6. **A cell reaction is Ni (s) | Ni $^{2+}$(0.01M)/Cu^{2+} (0.01M)/Cu(s) Calculate E cell of reaction and also write Nernst equation. Given: Eo (Ni^{2+} | Ni) = – 0.22 V and Eo (Cu^{2+} | Cu) = 0.34 V**
7. **The molar conductance of infinite dilution for sodium acetate (CH3COONa), Hydrochloric acid (HCl) and sodium chloride (NaCl) are 95.5,426.9 and 120.4 S cm2**
8. **mol−1 respectively at 298 K. Calculate the molar conductance of Acetic Acid (CH3COOH) at infinite dilution. * Ans ʎm = 402 Scm2mol-1 +**
9. **What amount of electricity can deposit 1 mole of Al metal at cathode when passed through molten AlCl3? *Ans.289500C+**
10. **How much faraday of electricity required to deposit 10 g of calcium from molten calcium chloride using inert electrodes? (molar mass of calcium=40g mol-1) *Ans.0.5F+**
11. **What amount of electricity can deposit 1 mole of calcium metal at cathode when passed through molten CaCl2? *Ans.193000C+**
12. **A cell reaction is Mg (s) | Mg $^{2+}$ (0.001M) // Cu^{2+} (0.0001M)/Cu(s). Calculate Ecell of a reaction and also write Nernst equation. Given: Eo (Mg^{2+} | Mg) = – 2.37 V and Eo (Cu^{2+} | Cu) = 0.34 V.**

Note: Any type Of Query Feel Free to Contact.

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SUMMER Holidays

HOMEWORK

Laying the foundation of excellence

PREFACE

Dear Parents and Students,

Summer vacation is around the corner, bringing with itself a much-needed respite from hectic school days. We hope that you will thoroughly enjoy the vacations and make the most of this summer. While it is indeed important that you relax and refresh yourselves, it is also important that you exercise your minds.

Keeping this in mind, we have designed various exciting activities to keep the students engaged and active during the summer vacation. These fun projects/ assignments would enhance learning skills, help understand concepts better, and make for a great crash course aimed at improving academic output.

These activities will not only help you to revise what was taught, but will also enrich your knowledge. These projects will be assessed as Subject Enrichment Activity, Portfolio or Art Integrated activity.

We encourage parents to motivate and support the students to ensure the given work is completed in time, to the best of their ability. Your support and encouragement both have a huge impact on your child's learning ability.

Wishing you a fun filled, safe summer vacation.

From: Shri Guru Teg Bahadur Sen. Sec. School Hassanpura (Gokhuwal) Batala

Shri Guru Teg Bahadur Sen. Sec. School Hassanpura (Gokhuwal) Batala
Grade- XII Session: 2025-26
Subject: Physics
Summer Holiday Homework

Instruction:

INTRODUCTION

The Assignment consists of **30 MARKS** out of which, **10 MARKS** will be allotted for the **PROJECT FILE (Decorated Cover)** and **5 Marks Neat and Clean Handwriting** & the remaining **15 MARKS** for the **whole content** based on the file.

- Use Pencil for Diagrams, Sketch, Sparkle Pen Colourful etc.

- **Complete your Class Notes till 01/07/2025 on the notebook**.
- **Write the whole homework on the Decorated Assignment with colourful Pages**.
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MCQ

1. Ratio of permittivity of a medium to the permittivity of free space is known as a) Dielectric medium b) Dielectric ratio c) Dielectric permittivity d) Dielectric Constant
2. A dipole is said to be in unstable equilibrium when angle between electric field and dipole moment is a) 450 b) 900 c)1800 d)00
3. ε0 is: (a) The permittivity of free space (b) The permeability of free space (c) The density of medium (d) The mass density of the medium
4. When we rub a glass rod with silk, then (a) Mass of the glass rod increases (b) Mass of silk decreases (c) Mass of glass rod decreases (d) Mass of glass rod & silk increases
5. When a charged rod is brought near the disc of a negatively charged gold leaf electroscope, it is observed that the divergence of leaves decreases. What reference do you draw about the charge on the rod? (a) Rod is positively charged (b) Rod has no charge (c) Rod is negatively charged (d) None of the above
6. The ratio of electric field due to an electric dipole at points situated at a distance r along its axial line and along its equatorial plane is (a) 1:2 (b) 2:1 (c)1:4 (d) 1:1
7. Which of the following quantity is a scalar? (a) Electric field intensity (b) Electric flux (c)Dipole moment (d)Torque
8. A charged comb attracts pieces of paper. Why does this happen? (a) paper also gets charged (b) Paper has no change (c) Paper is polarized (d) none of these
9. If excess charge is placed on isolated conductor, then, that amount of charge (a) get neutralized (b) either resides on surface of conductor/gets neutralized. (c) resides on the surface of conductor. d) move inside the conductor.
10. Which of the following has a permanent dipole moment? (a) Non-polar molecule (b) Polar molecule (c) A molecule placed in an electric field d) none of the above
11. The dimensional formula of ε0 is(a) [M-1 L-3 T4 A2] (b) [M L-3 T4 A2] (c) [M-1 L-2 T4 A] (d) [M L-3 T4 A]

12. The expression q1 + q2 = 0 signifies that (a) q1 and q2 are equal charges (b) q1 and q2 are equal charges with opposite signs (c) q1 and q2 are unequal charges having the same sign (d) q1 and q2 are equal charges having the same sign
13. A scientific instrument used to detect the charge on a body is known as: (a) Electrometer b) Electroscope c) Charge detector d) Miller counter
14. Trajectory of an electron when it moves perpendicular to the electric field is (a) Parabolic b) circular c) staright d) hyperbolic
15. When conductors are placed in an electric field, their electrons move (a) Opposite to the applied field (b) Randomly in all directions (c) In a direction of the applied field d) none of the above
16. The charge developed on a glass rod when rubbed with silk cloth is: (a) negative b) Positive c) May be positive negative d) none of the above
17. The S.I unit of electric flux is: (a) N/m2C (b) Nm2/C c) m2C/N d) NC/m2
18. In gold leaf electroscope, degree of divergence of gold leafs is indicator of: (a) Type of material (b)Type of electroscope (c) Amount of charge (d)none
19. Electric flux through an area dA for an electric field E is given by (a) E.dA (b) ExdA (c) E/dA (d) (E.dA)/q
20. To make an uncharged object have a negative charge: (a) Remove some electrons from it (b) Add some neutrons to it (c) Add some electrons to it d) Remove some neutrons from it
21. SI unit of electric field and electric force are (a) N/C and N (b) N/C for both (c) N for both (d) N and N/C
22. The field lines for single positive charge are: (a) Radiating outwards (b) Parallel (c) Circular (d) Radiating inwards
23. Two uncharged bodies on rubbing, get charged because of : (a) Conduction b) friction c) induction d) none of the above
24. SI unit of electric charge is: (a)Ampere b) volt c) coulomb d) ohm
25. A material in which electrons are tightly bound and cannot move freely at room temperature is called a/an (a) Insulator (b) Semiconductor (c) superconductor (d) conductor
26. Which type of symmetry does the electric field due to a point charge obey? (a)Spherical b) cylindrical (c) Both A and B (d) asymmetric
27. The expression q = ne signifies which property of electric charge. (a) Quantization of charge (b) Conservation of charge (c) Additivity of charges d) None of the above
28. Electric flux through a surface does not depend on (a) Angle of inclination between field & normal to surface (b) Surface area (c) Electric field (d) All of the above
29. What is the angle between the electric dipole moment and the electric field due to the dipole on its axial line? (a) 00 (b) 900 (c) 1800 (d) none of the above
30. If charges that are present in air are placed in water, force between 2 charges (a) Increases (b) Remains the same (c) Decreases d) Increases initially and then decreases to zero

TRUE AND FALSE

31. An alternating current can’t be used for electroplating. (true/false).
32. Electric potential at a point in an electric field may be defined as the work in moving a unit positive charge from infinity to that point. (true/false)
33. Electric field lines start from negative charge. (true/false)
34. After induction, charges move towards center of the conductor. (true/false)
35. Gauss law is applicable only when there is symmetric distribution of charge. (true/false)
36. At a point on the axis of an electric dipole neither electric field nor electric potential is zero. (true/false).
37. As per Gauss law , electric flux on closed surface due to outside charge is always zero .(true/false)
38. Coulomb’s force is non-conservative in nature.(true/false)
39. Excess charge given to conductor always resides on outer surface of the conductor.(true/false)
40. Electric field is zero inside the bulk material of the conductor . (true/false)

FILL IN THE BLANKS

41. Coulombs force is a/an _____ pair.
42. Charging a metal sphere by contact using a positively charged rod, followed by grounding can result in _____ charge in a metal sphere.
43. An electron initially at rest is accelerated through a potential difference of 1 V. The energy gained by the electron is_____
44. For uniform electric field, field lines are_____
45. A negative ion is an atom that _____ electrons
46. Dipole moment is a _____ quantity
47. NC-1 is SI unit of _____.
48. The process of charge transfer by induction is a /an_____
49. Magnitude of electric charge on a single electron is_____
50. The permittivity of free space is denoted by the symbol_____.

Electrostatics – I

1. Two charges each of + Q units are placed along a line. A third charge – q is placed between them. At what position and for what value of q, will the system be in equilibrium?
2. What kind of charges are produced on each, when (i) a glass rod is rubbed with silk and (ii) an ebonite rod is rubbed with wool?
3. Can a body have charge of 19 0.8 10 × C? Comment to justify your answer?
4. Name the experiment, which established quantum nature of electric charge.
5. How the mass of a body is affected on charging?
6. Force between two-point electric charges kept at a distance d apart in air is F. If these charges are kept at the same distance in water, how does the force between them change?
7. If the distance between two equal point charges is doubled and their individual charges are also doubled, what would happen to the force between them?
8. Ordinary rubber is an insulator. But the special rubber tires of aircrafts are made slightly conducting. Why is this necessary?
9. Vehicles carrying inflammable materials usually have metallic ropes touching the ground during motion. Why?
10. Can a charged body attract another uncharged body? Explain. Or Why does a charged glass rod attract a piece of paper?
11. A charge q is placed at the center of line joining two equal charges Q. Show that the system of three charges will be in equilibrium, if q = – Q/4.
12. Two point charges of charge values Q and q are placed at a distance of x and x / 2 respectively from a third charge of charge value 4 q, all charges being in the same straight line. Calculate the magnitude and nature of charge Q, such that the net force experienced by the charge q is zero.

Electrostatics - II

13. The force acting between two-point charges q1 and q2 kept at some distance apart in air attractive or repulsive when (i) q1 q2 > 0 (ii) q1 q2 < 0.
14. Sketch the electric lines of force for two- point charges q1 and q2 (q1 > q2) separated by a distance d.
15. Express dielectric constant in terms of capacitance.
16. What is the effect of introducing a dielectric slab between the plates of a parallel plate capacitor?
17. An electric dipole of dipole moment 20 × 10-6 C is enclosed by closed surface. What is the net electric flux coming out of this surface?

18. Sketch graph to show how charge Q given to a capacitor of capacitance C varies with the potential difference.
19. A charged air capacitor has stored energy U0. What will be the energy stored when air is replaced by a dielectric of dielectric constant K, charge Q remaining the same.
20. In a parallel plate capacitor, the capacitance increases from 4μF to 80 μF on introducing the dielectric medium between the plates. What is the dielectric constant of the medium?
21. In an electric field an electron is kept freely. If a proton replaces this electron, what will be the relationship between the forces experienced by them?
22. What orientation of an electric dipole in a uniform electric field corresponds to its stable equilibrium?
23. The force between two point charges kept at a distance r apart in air is F. If the same charges are kept in water at same distance, how does the force between them change?
24. Two point electric charges of unknown magnitude and sign are placed at a distance 'd' apart. The electric intensity is zero at a point, not between the charges but on the line joining them. Write two essential conditions for this to happen.
25. What should be the work done if a point charge + q is taken from a point A to the point B on the circumference drawn with another point + q at the center?
26. A and B are two conducting spheres of the same radius, A being solid and B hollow. Both are charged to the same potential. What will be the relation between the charges on the two spheres?
27. How much work is done in moving a 500 μC charge between two points on an equi-potential surface.
28. Name the dielectric whose molecules have (i) non-zero (ii) zero dipole moment.
29. A positively charged particle is free to move in an electric field. Will it always move along the line of force?
30. A proton and an electron are placed freely in an electric field. Which of the particles will have greater acceleration and why?
31. State Gauss's law in electrostatics. Use this law derive an expression for the electric field due to a long straight wire of linear charge density λ C-m.
32. Briefly explain the principle and working of Van de Graff generator with the help of labelled diagram.
33. State and prove Coulombs Law in Electrostatics and Vector Form Both.
34. What do you meant by Polar and non-polar molecule with examples?

Numerical

35. What is the charge acquired by a body when 1 million electrons are transferred to it?
36. An attractive force of 5N is acting between two charges of +2.0 μC & -2.0 μC placed at some distance. If the charges are mutually touched and placed again at the same distance, what will be the new force between them?
37. A charge of +3.0 x 10-6 C is 0.25 m away from a charge of -6.0 x 10-6C.
    a. What is the force on the 3.0 x 10-6 C charge?
    b. What is the force on the -6.0 x 10-6 C charge?
38. An electric dipole consists of a positive and a negative charge of 4μC each placed at a distance of 5mm. Calculate dipole moment.
39. Two dipoles, made from charges ±q and ±Q, respectively, have equal dipole moments. Give the (i) ratio between the 'separations' of these two pairs of charges (ii) angle between the dipole axis of these two dipoles.
40. Two equal magnitude charges have 19N force in between them. They have been kept 8cm apart. Find the magnitude of the charge.
41. Find the magnitude of the electric field when the charge is -5×10^{-6} C
42. When two object are rubbed with each other, approximately a charge of 50nC can be produced in each object. Calculate the number of electrons that must be transferred to produce this charge.

➢ Write the Neat and Clean Important Formula 1 to 18 in the Assignment and learn it.

IMPORTANT FORMULAE

1. **Electrostatic force between two charges**
   $F = K.\frac{q_1q_2}{r^2} = \frac{1}{4\pi\epsilon_0\epsilon_r}.\frac{q_1q_2}{r^2}$
   For air, $\epsilon_r = 1$
   Fair $= \frac{1}{4\pi\epsilon_0}.\frac{q_1q_2}{r^2} = 9\times10^9\ \frac{q_1q_2}{r^2}$
2. **Electric field intensity due to a point charge,** $\vec{E} = \lim_{q_0\to0}\frac{\vec{F}}{q_o}$
3. **Electric field intensity due to infinite linear charge density (λ)**
   $E = \frac{1}{4\pi\epsilon_0}.\frac{2\lambda}{r}$
4. **Electric field intensity near an infinite thin sheet of surface charge density σ**
   $E = \frac{\sigma}{2\epsilon_0}$
   For thick sheet $= \frac{\sigma}{\epsilon_0}$.
5. **Electric potential,** $V = \lim_{q_0\to0}\frac{w}{q_o}$
   Electric potential due to a point charge, $V = \frac{1}{4\pi\epsilon_0}.\frac{q}{r}$
6. **Relation between electric field and potential** $E = -\frac{dV}{dr} = \frac{V}{r}$ **(numerically)**
7. **Dipole moment,** $\vec{P} = q.2\vec{l}$
8. **Torque on a dipole in uniform electric field,** $\vec{\tau} = \vec{p}\times\vec{E}$.
9. **Potential energy of dipole,** $\cup = -\vec{p}.\vec{E} = -pE\cos\theta$
10. **Work done in rotating the dipole in uniform electric field from orientation Q_1 to Q_2 is**
    $W = U_2 - U_1 = pE(\cos\theta_1 - \cos\theta_2)$
11. **Electric field due to a short dipole**
    (i) at axial point, $E_{axis} = \frac{1}{4\pi\epsilon_0}.\frac{2p}{r^3}$
    (ii) at equatorial point, $E_1 = \frac{1}{4\pi\epsilon_0}.\frac{p}{r^3}$
12. **Electric potential due to a short dipole**
    (i) At axial point, $V_{axis} = \frac{1}{4\pi\epsilon_0}.\frac{p}{r^2}$
    (ii) At equatorial point, $V = 0$.
13. **Dielectric constant,** $K = \frac{\epsilon}{\epsilon_0} = \frac{C_{med}}{C_{air}}$
14. **Capacitance of parallel plate capacitor**
    (i) $C = \frac{A\epsilon_0K}{d}$, **in medium of dielectric constant K**
    (ii) $C = \frac{A\epsilon_0}{d-t(1-\frac{1}{K})}$; **if space between plate partially filled with dielectric of thickness t.**
15. **Combination of capacitors :-**
    (i) **In series,** $\frac{1}{C} = \frac{1}{C_1}+\frac{1}{C_2}+\frac{1}{C_3}$, $q_1 = q_2 = q_3$, $V = V_1 + V_2 + V_3$
    (ii) **In parallel,** $C = C_1 + C_2 + C_3$, $q = q_1 + q_2 + q_3$, $V_1 = V_2 = V_3 = V$
16. **Energy stored by capacitor**
    $\cup = \frac{1}{2}CV^2 = \frac{Q^2}{2C} = \frac{1}{2}QV$
17. **Electrostatic energy density**
    $\vartheta_e = \frac{1}{2}\epsilon_0E^2$, **in air**
    $\vartheta_e = \frac{1}{2}\epsilon E^2$, **in medium**
18. **Total electric flux,** $\Phi = \oint\vec{E}.\vec{ds} = \frac{1}{\epsilon_0}\times$ ***net charge enclosed by the surface***

Holiday homeworkof biology 12th

A) prepare a file on the following topics with well labelled diagrams.

Topics:-

a) cancer

b) Drugs and tobacco

c) DNA replication

d) Birth control methods

e) Explain oogenesis and spermatogenesis .

f) Explain STDs.

g) Pollination and it’s types.

h) Structure of embryo sac.

Class -12th

Instructions

1. Revise and practice all the done in class room
2. Worksheets of all the students will be shared in class and worksheets solve in respective subject registers.
3. Label holiday homework and submit in a decorated handmade A4 size folders
4. Originality of the work will be appreciated
5. Project/ Homework will be assessed on the basis of neatness, creativity and originality of ideas
6. Completed practical files / project files are also to be submitted along with holiday homework
7. Make the colourful chart with colourful pictures.
8. Writing should be very good and neat
9. Do your vacation work by yourself.

10 It is necessary to do all the work on , according to this your number will be filled on portal .

1 If A is a square matrix such that $A^2 = I$, then find the simplest value of $(A - 1)^3 + (A + 1)^3 - 7A$.

2 Write the number of all possible matrices of order 2 x 2 with each entry 1,2 or 3.

3 if [2 1 3] = A , the write the order of matrix A

4 if then find (x-y).

5. Solve the following matrix equation for x(x 1)

6. If matrix A= and $A^2 = KA$ then write the value of K

7. In the interval" $\pi/2 < x < \pi$ find the value of x for which the matrix is singular matrix ?

8 For what value of X , A = is a singular matrix

9 For what value of K , the system of linear equation , $x + y + z = 2$, $2x + y - z = 3$, $3x + 2z = 4$ has a unique solution

10. If A is a square matrix of order 3 such that $|adjA| = 64$, find the $|A|$.

11. If = 8 , then write the value of x.

12. if A = [3 5] , B = [7 3] then find matrix C such that AC = BC

13. If A= find A^{16}.

14. If A= find ά satisfying $0 < ά < \pi/2$ when A + A' = $\sqrt{2}\, i_2$ where A' is transpose of A

15. Show that is inverse of the matrix

16. Find the matrix A such that A =

17. Given that A = and B = find AB. Use this result to solve the following system of linear equations x-2y+z=4; x-2y-2z=9 ; 2x+y+3z=1.

18. Find A^{-1} if A = and hence solve the system of linear equations: -x+2y+5z=2 ; 2x-3y+z=15; -X+y+z=-3

19 Act. Make a chart of Differentiation formula

20 Make a assignment on Definition & types of matrix

G.Punjabi

ਆਪਣੀ ਕਿਤਾਬ ਵਿੱਚੋਂ ਡਾਕਟਰ ਬਰਿੰਦਰ ਕੌਰ ਦਾ ਲਿਖਿਆ ਲੇਖ 'ਪੰਜਾਬੀ ਸੱਭਿਆਚਾਰ' ਪੜ੍ਹੋ ਅਤੇ ਦਿੱਤੀਆਂ ਹਦਾਇਤਾਂ ਅਨੁਸਾਰ ਹੇਠਾਂ ਦਿੱਤਾ ਕਾਰਜ ਕਰੋ।

- ਲੇਖ ਦਾ ਕਵਰ ਪੇਜ ਬਣਾਓ|
- ਡਾਕਟਰ ਬਰਿੰਦਰ ਕੌਰ ਬਾਰੇ ਵਿਸੇਸ ਜਾਣਕਾਰੀ ਦਿਓ|
- ਇਸ ਲੇਖ ਦੇ ਵਸਤੂ ਨਿਸਠ ਪ੍ਰਸਨ ਉੱਤਰ ਅਤੇ ਸੰਖੇਪ ਉੱਤਰਾ ਵਾਲੇ ਪ੍ਰਸਨ ਉੱਤਰ A4 ਰੰਗੀਨ ਸ਼ੀਟ ਉੱਤੇ ਕਰਕੇ ਕਵਰ ਪੇਜ ਵਾਲੀ ਫਾਈਲ ਬਣਾਓ।

ਜਾਂ

'ਪੰਜਾਬੀ ਸੱਭਿਆਚਾਰ' ਦਾ ਮਾਡਲ ਤਿਆਰ ਕਰੋ ।

ਕਲਾਸ ਵਿੱਚ ਕਰਾਏ ਗਏ ਸਾਰੇ ਸਿਲੇਬਸ ਨੂੰ ਯਾਦ ਕਰੋ।

Holidays Homework for +2 Science

- ***Activity work***
  Make chart on **Determiner**
- ***Write Translation Sentences***
  1-25
- ***Write Comprehensive Questions answers of both poems on notebook***
  1.On Friendship
  2. Prayer of woods
- ***Learn and write question answer of chapter - The School for Sympathy***

- ***Learn Full Syllabus***