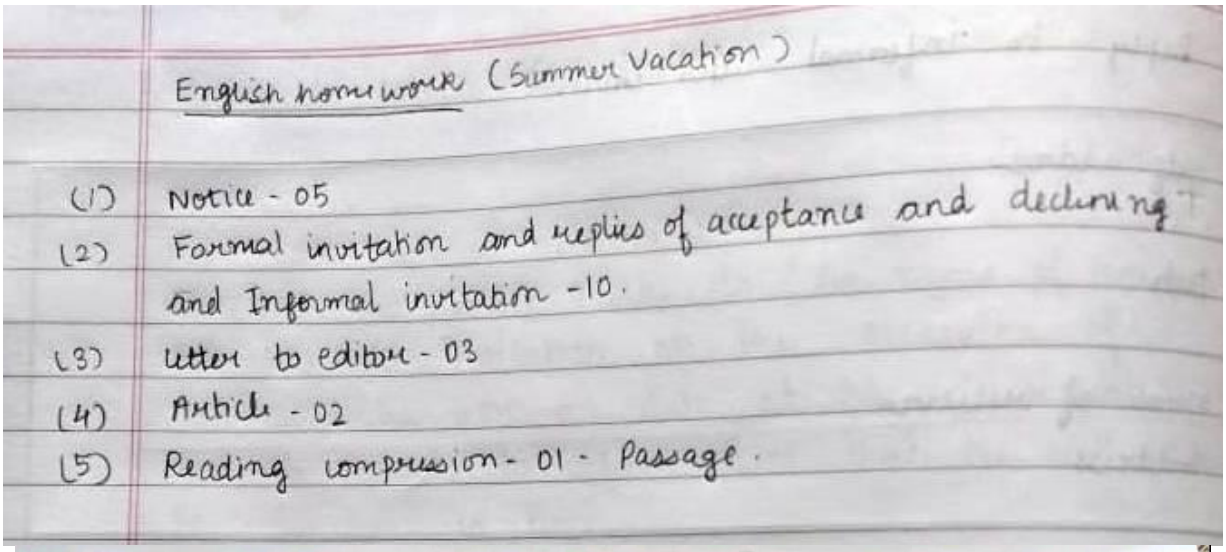
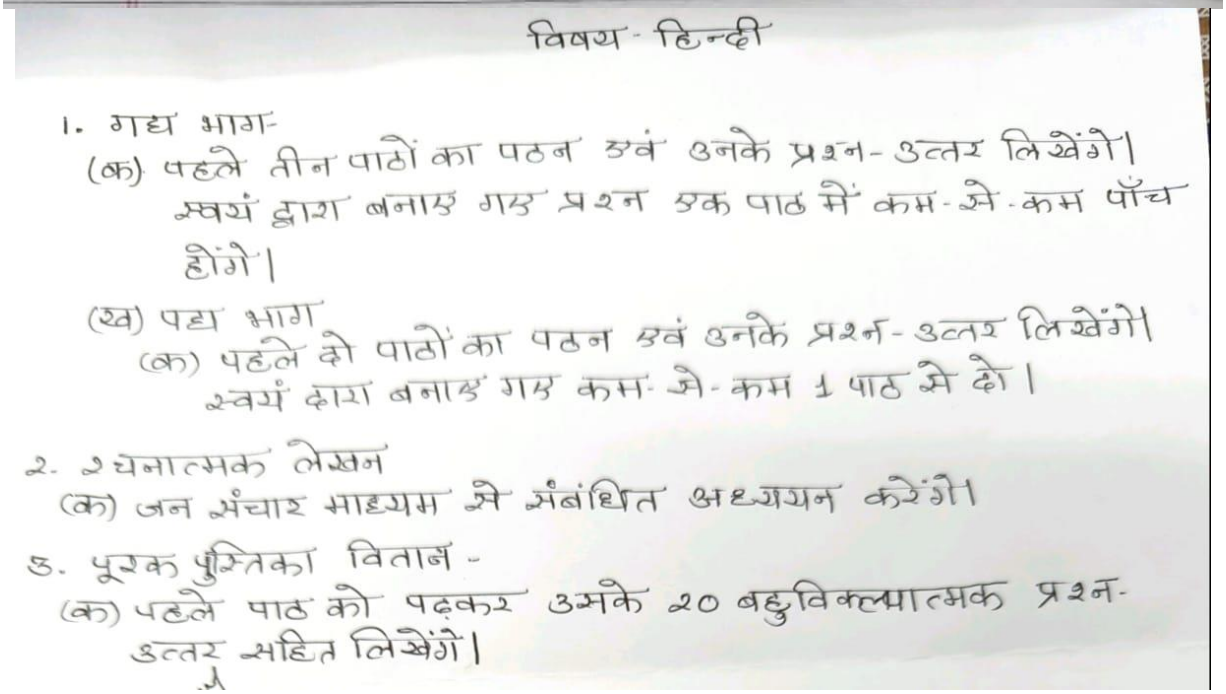
CLASS-XII-HOLIDAY HOMEWORK

CLASS-XII



English homework (Summer Vacation)

(1) Notice - 05
(2) Formal invitation and replies of acceptance and declining and Informal invitation -10.
(3) Letter to editor - 03
(4) Article - 02
(5) Reading comprehension - 01 - Passage.



विषय - हिन्दी

1. गद्य भाग-
(क) पहले तीन पाठों का पठन एवं उनके प्रश्न-उत्तर लिखेंगे। स्वयं द्वारा बनाए गए प्रश्न एक पाठ में कम-से-कम पाँच होंगे।

(ख) पद्य भाग
(क) पहले दो पाठों का पठन एवं उनके प्रश्न-उत्तर लिखेंगे। स्वयं द्वारा बनाए गए कम-से-कम 1 पाठ से दो।

2. रचनात्मक लेखन
(क) जन संचार माध्यम से संबंधित अध्ययन करेंगे।

3. पूरक पुस्तिका वितान -
(क) पहले पाठ को पढ़कर उसके 20 बहुविकल्पात्मक प्रश्न-उत्तर सहित लिखेंगे।

SUBJECT : COMPUTER SCIENCE

1. **Write the notes in your class notebook :**
   a. **Chapter-1. Revision of Python**
   b. **Chapter-2. Function**
   c. **Chapter-3 File Handling**

2. Write the programs in your practical copy as given in the Google Class Room.

CHEMISTRY

1. **CLASS XII**
   a) Complete the file of investigatory project as per the topic assigned to you. Please refer the two sample files provided in the class.
   b) Solve two question papers of chapters 'Solutions' and 'Chemical Kinetics' shared in class WhatsApp group. Use A4 size ruled/plain papers. (Don't use calculator)
   c) Revise chapter 'Chemical Kinetics' for surprise class test in June.

MATHEMATICS

SESSION 2023-24

(1)SOLVE QUESTIONS OF CH-1 AND CH-2 FROM SEE QUESTION PAPERS OF LAST THREE YEARS (2021,2022,2023)

(2)PREPARE TRIGONOMETRIC FORMULAS WHICH ARE ALREADY SUPPLIED TO YOU.

(3)WRITE MISC.EXERCISES OF CHAPTER-1 AND CHAPTER-2

SUMMER VACATION HOLYDAY WORK 2023-24
CLASS: 12 SUBJECTS: BIOLOGY

1. **MAKE A QUESTION BANK WITH ANSWER IN H.W. NOTE BOOK FROM LAST FIVE YEARS CBSE QUESTION PAPERS OF THESE CHAPTERS**
   1. SEXUAL REPRODUCTION IN FLOWERING PLANTS
   2. HUMAN REPRODUCTION
   3. REPRODUCTIVE HEALTH
   FROM EACH CHAPTER:
   (i)MCQ -10
   (ii)ASSERTION & REASON QUESTIONS -5
   (iii) CASE BASE QUESTIONS -5
   (iv) VERY SHORT ANSWER QUESTIONS – ONE MARK QUESTIONS-10
   (v) TWO MARKS QUESTIONS -5
   (vi) THREE MARKS QUESTIONS -5
   (vii) AND FIVE MARKS QUESTIONS -5
2. **COMPLETION OF INVESTIGATORYB PROJECT ON GIVEN TOPICS:**

SN.	R.N.	NAME OF STUDENTS	TOPICS
1	1203	Ashmi chaudhari	Rh FACTOR IN BLOOD
2	1206	Grace Thomas	BLOOD CIRCULATION
3	1207	Happy chaudhary	CANCER
4	1208	Happy patel	ERASING AND IMPLANTING HUMAN MEMORY
5	1209	Khushi Bhatt	DIABETIES MELLITUS V/S DIABETIES INSIPIDUS
6	1210	Maitri sutharia	DNA
7	1211	Mrinalin	MALARIA
8	1214	Pranav Ahuja	PHOTOTROPISM

9	**1215**	**Pranjal Gond**	**STRESS**
10	**1216**	**Prerana Ojha**	**HUMAN HEART AND DISEASES**
11	**1219**	**Sneha Pradhan**	**CIRCULATORY SYSTEM**
12	**1220**	**Tanishka H.**	**BLOOD PRESSURE**
13	**1221**	**Vaidehi**	**DRUG ABUSE**
14	**1224**	**Yamisha khokar**	**DRUGS**

KENDRIYA VIDYALAYA NO. 2 KRIBHCO SURAT

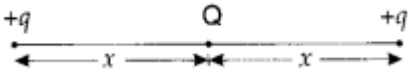
Holiday Homework CLASS XII SUB: PHYSICS

CHAPTER 1

Electric charges and field

COMPETENCY BASED QUESTIONS

1. A charge Q is placed at the centre of the line joining two-point charges +q and +q as shown in



(a) 4 (b) 1/4

(c) -4 (d) -1/4

2. The SI unit of electric flux is

(a) N C^{-1} m^{-2} (b) N C m^{-2}

3. Which of the following statements is not true about Gauss's law?

(a) Gauss's law is true for any closed surface.

(b) The term q on the right side of Gauss's law includes the sum of all charges enclosed by the surface.

(c) Gauss's law is not much useful in calculating electrostatic field when the system has some symmetry.

(d) Gauss's law is based on the inverse square dependence on distance contained in the

4. Consider a region inside which, there are various types of charges but the total charge is zero. At points outside the region

(a) the electric field is necessarily zero.

(b) the electric field is due to the dipole moment of the charge distribution only.

(c) the dominant electric field is inversely proportional to r^3, for large r (distance from origin).

(d) the work done to move a charged particle along a closed path, away from the region will not

.

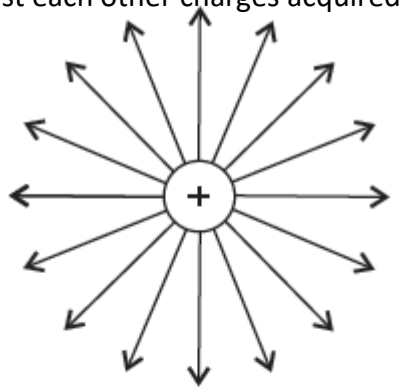
5. Corona discharge takes place:

6. Quantisation of charge implies:

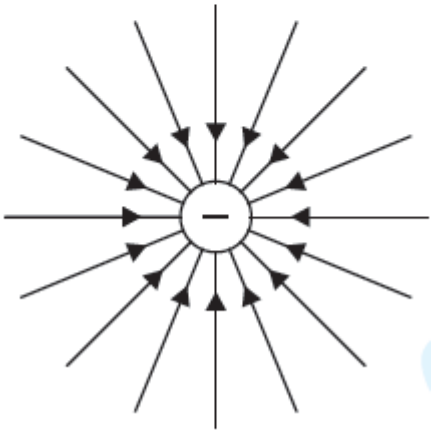
(a) Charge does not exist (b) Charge exists on particles

7. Read the para given below and answer the questions that follow:

An electric charge is a property associated with the matter due to which it experiences and produces an electric and magnetic field. Charges are scalar in nature and they add up like real number. Also, the total charge of an isolated system is always conserved. When the objects rub against each other charges acquired by them must be equal and opposite.



Electric field lines of a positive point change



Electric field lines of a negative point change

i. The cause of a charging is:

(a) the actual transfer of protons.
(b) the actual transfer of electrons.
(c) the actual transfer of neutrons.
(d) none the above

ii. Pick the correct statement.

(a) The glass rod gives protons to silk when they are rubbed against each other.
(b) The glass rod gives electrons to silk when they are rubbed against each other.
(c) The glass rod gains protons from silk when they are rubbed against each other.
(d) The glass rod gains electrons when they are rubbed against each other.

iii. If two electrons are each 1.5×10^{-10} m from a proton on opposite sides of it, the magnitude of the net electric force they will exert on the proton is

(a) Zero (b) 2.73×10^{-8}N

(c) 3.83×10^{-8}N (d) 4.63×10^{-8}N

iv. A charge is a property associated with the matter due to which it produces and experiences:

(a) electric effects only (b) magnetic effects only

(c) both electric and magnetic effects (d) none of these.

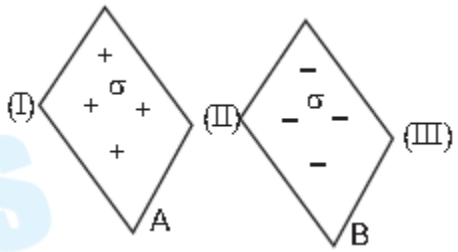
iv. The cause of quantization of electric charges is:

(a) Transfer of an integral number of neutrons. (b) Transfer of an integral number of protons.

(c) Transfer of an integral number of electrons. (d) None of the above.

8. Read the para given below and answer the questions that follow:

Surface Charge Density. Surface charge density is defined as the charge per unit surface area the surface (Areal) charge symmetric distribution and follow Gauss law of electrostatics mathematical term of surface charge density σ = ΔQ/ΔS



Two large thin metal plates are parallel and close to each other. On their inner faces, the plates have surface charge densities of opposite sign (± σ) having magnitude $8.8 \times 10^{-12}\ cm^{-1}$ as shown here. The intensity of electric field at a point is E = σ/ϵ_0 and flux is Φ = $\vec{E} \cdot \vec{S}$, where ΔS = 1 m^2 (unit arial plate)

i. E in the outer region (I) of the first (A) plate is

(a) 1.7×10^{-22} N/C (b) 1.1×10^{-12}V/m

(c) Zero (d) Insufficient data

ii. E in the outer region (III) of the second plate (B) is

(a) 1 N/C (b) 0.1 V/m

(c) 0.5 N/C (d) zero

iii. E between (II) the plate is

(a) 1 N/C (b) 0.1 V/m

(c) 0.5 N/C (d) None of these

iv. The ratio of E from left side of plate A at distance 1 cm and 2 m respectively is

(a) 1: √2 (b) 10 : √2

(c) 1 : 1 (d) √20 : 1

v. In order to estimate the electric field due to a thin finite plane metal plate the Gaussian surface considered is

(a) Spherical (b) Linear

OBJECTIVE TYPE QUESTIONS- Assertion and Reasoning type

Directions: These questions consist of two statements, each printed as Assertion and Reason. While answering these questions, you are required to choose any one of the following four responses.

(a) Both Assertion and Reason are correct and the Reason is a correct explanation of the Assertion.

(b) Both Assertion and Reason are correct but Reason is not a correct explanation of the Assertion.

(c) Assertion is correct, Reason is incorrect

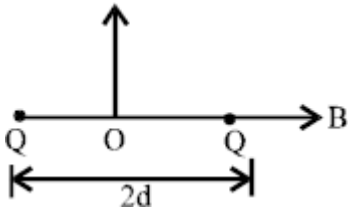
9. Assertion: A metallic shield in form of a hollow shell may be built to block an electric field.
Reason: In a hollow spherical shield, the electric field inside it is zero at every point.

10. Assertion: The tyres of aircraft are slightly conducting.
Reason: If a conductor is connected to ground, the extra charge induced on conductor will flow to ground.

11.Assertion: A deuteron and an α particle are placed in an electric field. If F_1 and F_2 be the forces acting on them and a_1 and a_2 be their accelerations respectively then, $a_1 = a_2$.
Reason: Forces will be same in electric field.

12. Assertion: The property that the force with which two charges attract or repel each other are not affected by the presence of a third charge.
Reason: Force on any charge due to a number of other charges is the vector sum of all the forces on that charge due to other charges, taken one at a time.

13. Assertion: Consider two identical charges placed distance 2d apart, along x-axis.



The equilibrium of a positive test charge placed at the point O midway between them is stable for displacements along the x-axis.

Reason: Force on test charge is zero.

SHORT ANSWER/ LONG ANSWER TYPE QUESTIONS

2 Marks

14. (a) Explain the meaning of the statement 'electric charge of a body is 'quantized'.

(b) Why can one ignore quantisation of electric charge when dealing with macroscopic i.e., large scale charges?

(b) In macroscopic or large-scale charges, the charges used are huge as compared to the magnitude of electric charge. Hence, quantization of electric charge is of no use on macroscopic scale. Therefore, it is ignored and it is considered that electric charge is continuous.

15. A thin straight infinitely long conducting wire having charge density X is enclosed by a cylindrical surface of radius r and length l, its axis coinciding with the length of the wire. Find the expression for the electric flux through the surface of the cylinder.

16. Write the expression for the work done on an electric dipole of dipole moment p in turning it from its position of stable equilibrium to a position of unstable equilibrium in a uniform electric

field E.

17. Careful measurement of the electric field at the surface of a black box indicates that the net outward flux through the surface of the box is $8.0 \times 10^3\ N\,m^2/C$.

(a) What is the net charge inside the box?

(b) If the net outward flux through the surface of the box were zero, could you conclude that there were no charges inside the box? Why or Why not?

18. An electric dipole when held at 30^0 with respect to a uniform electric field of $10^4 N/C$ experienced a Torque of $9 \times 10^{-25}\ Nm$. Calculate dipole moment of the dipole?

19. Two point charges +q and +9q are separated by a distance of 10 a. Find the point on the line joining the two changes where electric field is zero?

20. (a) Derive the expression for the electric field at a point on the equatorial line of an electric dipole.

(b) Discuss the orientation of the dipole in (a) stable, (b) unstable equilibrium in a uniform electric field.

21. An electric field along the x-axis is given by $\vec{E}$ = 100 î N/C for x > 0 and $\vec{E}$ = -100 î N/C for x < 0. A right circular cylinder of length 20 cm and radius 5 cm lies parallel to the x-axis with its

centre at the origin and one face at x = +10 cm, the other face at x = -10 cm. Calculate the net outward flux through the cylinder.

22. (i) Derive the expression for electric field at a point on the equatorial line of an electric dipole.

(ii) Depict the orientation of the dipole in

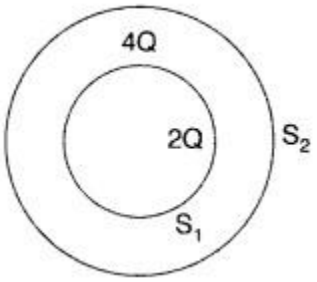
(b) unstable equilibrium in a uniform electric field.

23. Two charged spherical conductors of radii R_1 and R_2 when connected by a conducting wire acquire charges q_1 and q_2 respectively. Find the ratio of their surface charge densities in terms of their radii.

5 marks

24. (a) Deduce the expression for the torque acting on a dipole of dipole moment $\vec{p}$ in the presence of a uniform electric field E.

(b) Consider two hollow concentric spheres, S_1 and S_2, enclosing charges 2Q and 4Q respectively as shown in the figure.



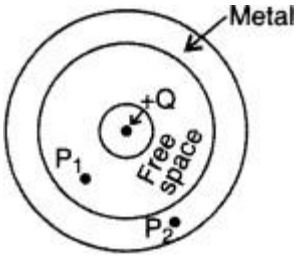
(i) Find out the ratio of the electric flux through them.

(ii) How will the electric flux through the sphere S_1 change if a medium of dielectric constant 'ε_r' is introduced in the space inside S_1, in place of air? Deduce the necessary expression.

25.(a) Define electric flux. Write its S.I. unit.

(b) A small metal sphere carrying charge +Q is located at the centre of a spherical cavity inside a large uncharged metallic spherical shell as shown in the figure the expressions for the electric field at points P_1 and P_2.

(c) Draw the pattern of electric field lines in this arrangement.



CHAPTER 2

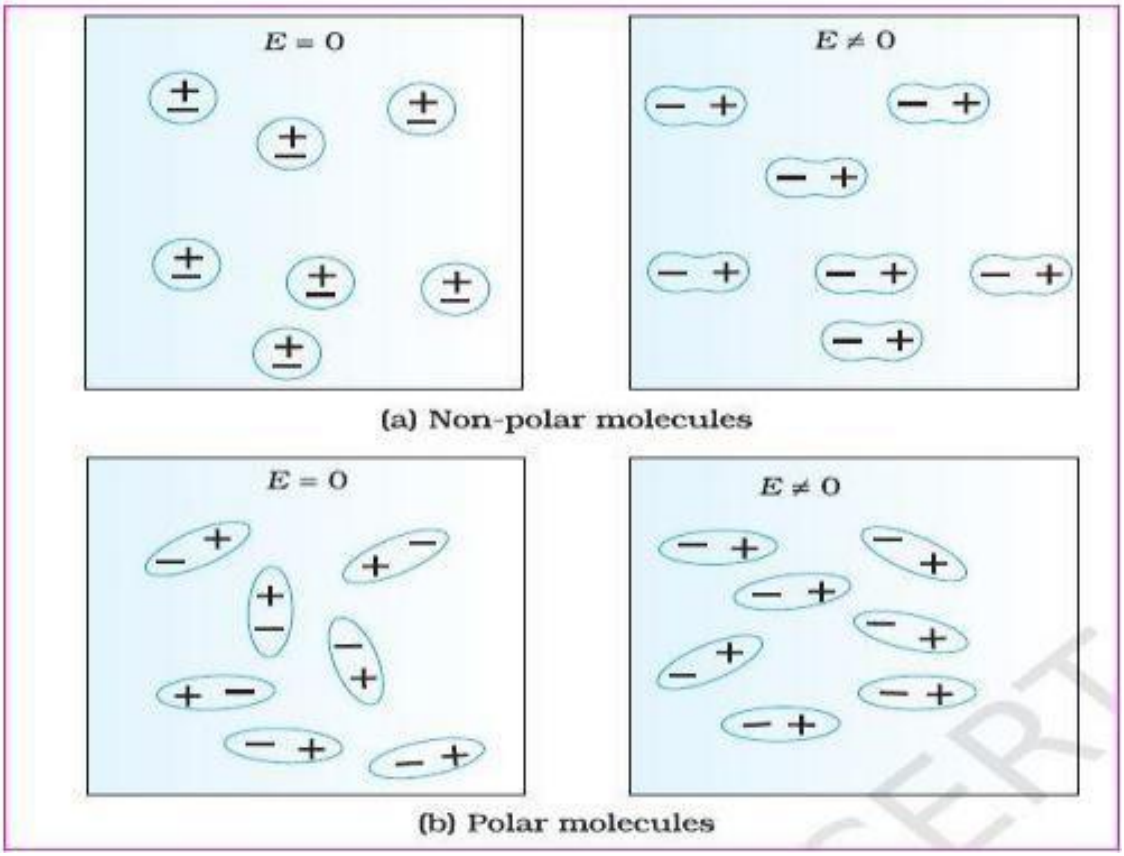
ELECTROSTATIC POTENTIAL AND CAPACITANCE

ELECTROSTATIC POTENTIAL AND CAPACITANCE

COMPETENCY BASED QUESTIONS (CASE STUDY)

COMPETENCY BASED QUESTIONS (CASE STUDY)

Q.1 Dielectric with polar molecules also develops a net dipole moment in an external field, but for a different reason. In the absence of any external field, the different permanent dipoles are oriented randomly due to thermal agitation; so the total dipole moment is zero. When an external field is applied, the individual dipole moments tend to align with the field. When summed overall the molecules, there is then a net dipole moment in the direction of the external field, i.e., the dielectric is polarised. The extent of polarisation depends on the relative strength of two factors: the dipole potential energy in the external field tending to align the dipoles mutually opposite with the field and thermal energy tending to disrupt the alignment. There may be, in addition, the 'induced dipole moment' effect as for non-polar molecules, but generally the alignment effect is more important for polar molecules. Thus in either case, whether polar or non-polar, a dielectric develops a net dipole moment in the presence of an external field. The dipole moment per unit volume is called polarization.



(i) The best definition of polarisation is

(a) Orientation of dipoles in random direction (b) Electric dipole moment per unit volume

(c) Orientation of dipole moments (d) Change in polarity of every dipole

(ii) Calculate the polarisation vector of the material which has 100 dipoles per unit volume in a volume of 2 units.

(a) 200 (b) 50 (c) 0.02 (d) 100

(iii) The total polarisation of a material is the

(a) Product of all types of polarisation (b) Sum of all types of polarisation

(c)Orientation directions of the dipoles (d)Total dipole moments in the

(iv) Dipoles are created when dielectric is placed in _____

(a) Magnetic Field (b) Electric field (c) Vacuum (d) Inert Environment

(v) Identify which type of polarisation depends on temperature.

(a)Electronic (b)Ionic (c) orientational (d) Interfacial

OBJECTIVE TYPE QUESTIONS-

Q.2 Dimensional formula of capacitance is

(a) $[M^{-1} L^{-2} T^{4} A^{2}]$ (b) $[M^{-1} L^{-1} T^{3} A^{1}$ (c) $[M L^{-2} T^{4} A^{2}]$ (d) $[M^{0} L^{-2} T^{4} A^{1}]$

Q.3 A dielectric slab is placed in between the plates of a parallel plate capacitor. Its capacitance is

(a) becomes zero (b)remains the same (c) decreases (d) increases

Q, (4) Angle between equipotential surface and electric field lines is

(a) Zero (b)180^{0} (c)90^{0} (d)45^{0}

Q. (5) Electric potential of earth is taken to be zero because earth is a good

(a)Insulator (b)Conductor (c)Semiconductor (d)Dielectrics.

Q. (6) The electric potential V at any point O (x, y, z all in metres) in space is given by V = $4x^2$ volt. The electric field at the point (1 m, 0, 2 m) in volt/metre is

(a) 8 along negative x-axis. (b) 8 along positive x-axis. (c) 16 along negative x-axis (d) 16 along positive z-axis

Q. (7) Twenty-seven drops of mercury are charged simultaneously to the same potential of 10 volts. What will be potential if all the charged drops are made to combine to form one large drop?

(a)180 V (b) 90 V (c) 120 V (d) 45 V

Q. (8) A conducting body with uniform potential has concentrated---------- at sharp points of the body.

Assertion and Reasoning type

Assertion (A) & Reason(R) For question numbers 2to 6, two statements are given-one labelled Assertion (A) and the other labelled Reason (R). Select the correct answer to these questions from the codes (a), (b), (c) and (d) as given below.

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

B) Both A and R are true but R is NOT the correct explanation of A

C) A is true but R is false

D) A is false and R is also false

Q.9 Assertion (A): Sensitive instruments can protect from outside electrical influence by enclosing them in a hollow conductor.

Reason(R): Potential inside the cavity is zero.

Q,10 Assertion(A): No work is done in moving a point charge Q around a circular arc of radius 'r' at the Centre of which another point charge 'q' is located.

Reason(R): No work is done in moving a test charge from one point to another over an equipotential surface.

Q. 11 Assertion (A): A metal plate is introduced between the plates of a charged parallel plate capacitor, its capacitance increased.

Reason(R): A metal plate is introduced between the plates of a charged parallel plate capacitor; the effective separation between the plates is decreased.

Q. 12 Assertion (A): Work done by the electrostatic force in bringing the unit positive Charge form infinity to the point P is positive.

Reason(R): The force on a unit positive test charge is attractive, so that the electrostatic force and the displacement (from infinity to P) are in the same direction.

Q. 13 Assertion (A): Earthing provides a safety measure for electrical circuits and appliances.

Reason(R): When we bring a charged body in contact with the earth, all the excess charge on the body disappears by causing a momentary current to pass to the ground through the connecting

SHORT ANSWER/ LONG ANSWER TYPE QUESTIONS

Q.14 Can two equipotential surface intersect each other? Justify your answer.

Q. 15 Two charges 2μC and – 2μC are placed at points A and B 5 cm apart. Depict an equipotential surface of the system.

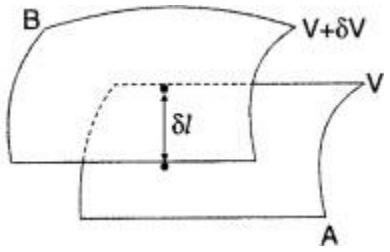
Q. 16 "For any charge configuration, equipotential surface through a point is normal to the electric field." Justify.

Q.17 The graph shows the variation of voltage V across the plates of two capacitors A and B versus increase of charge Q stored on them. Which of the capacitors has higher capacitance? Give reason for your answer.

$Q.18$ **Two point charges q_1 and q_2 are located at $\bar{r}_1$ and $\bar{r}_2$ respectively in an external electric field $\bar{E}$ .Obtain the expression for the total work done in assembling this configuration.**

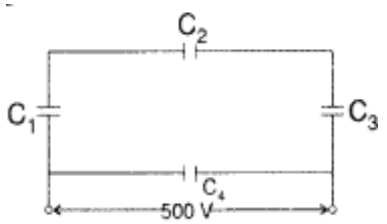
Q. 19 Derive an expression for the potential energy of an electric dipole of dipole movement $\bar{p}$ in the electric field $\bar{E}$.

Q.20 Two closely spaced equipotential surfaces A and B with potentials V and V + δV, (where δV is the change in V), are kept δl distance apart as shown in the figure.



Deduce the relation between the electric field and the potential gradient between them. Write the two important conclusions concerning the relation between the electric field and electric potentials.

Q.21 Network of four capacitors each of 15 μF capacitance is connected to a 500 V supply as shown in the figure.



Determine

(a) equivalent capacitance of the network and

(b) charge on each capacitor.

Q. 22 Two point charges, $q_1 = 10 \times 10^{-8}C$, $q_2 = -2 \times 10^{-8}C$ are separated by a distance of 60 cm in air.

(i) Find at what distance from the 1st charge, q_1 would the electric potential be zero.

(ii) Also calculate the electrostatic potential energy of the system.

Q.23 A parallel plate capacitor is charged by a battery. After some time, the battery is disconnected and a dielectric slab of dielectric constant K is inserted between the plates. How would

(i) the capacitance,

(ii) the electric field between the plates and

(iii) the energy stored in the capacitor, be affected? Justify your answer.

Q.24 Derive the expression for the capacitance of a parallel plate capacitor having plate area A and plate separation d.

Q.25 (i) Derive the expression for the electric potential due to an electric dipole at a point on its axial line.

(ii) Depict the equipotential surfaces due to an electric dipole.