

Hot sizzling summer reminds us of the time,
To break free and bask in the warm sunshine.
There's a burst of activities without minding the scorching heat,
When friends are making merry and relishing the ice cream treat.
So blend enjoyment with learning and introspection,
To fetch glory and attain perfection.
"Intelligence is the ability to adapt"
Knowledge is power and to impart it righteously to our children, we have carefully and meticulously designed the Summer Break Assignment. It aims to create a spirit of enquiry, creativity and sensibility among the learners. It is vital to enable our learners to foster an outlook that helps them explore, discover and rediscover. Summer vacation is the best and fruitful time for learning and nurturing creativity. A variety of fun-filled activities and worksheets are given to be attempted during summer break. The major emphasis is laid on "Learning by doing".

Attempt the assignments neatly and beautify them by providing required illustrations. Summer vacation is the time to learn and enjoy. So spend these holidays creating a nurturing and stimulating environment filled with fun, frolic and learning.

## Have an enjoyable Summer Break!

Will meet again on 1st July, 2023.

# Jain Vidya Mandir Sr. Sec. School 

Session 2023-24

Holiday Homework
Class-12 Science

## English

## Summer Holidays Assignm

Syllabus for July Unit Test:
Flamingo: Learn Chapter 1, 2, 3
Learn poem 1, 3
Vistas: Learn Chapter 1, 2
Writing Section: Practice Notice, Invitation \& Reply
Art Integrated Projects: Make the following projects as per the given instructions.

## 1. Creative Corner

ぇ Are there any water sports in India? Find out about the areas or places which are known for water sports and prepare catchy handouts for them.
$\star$ Prepare a comic Strip based on the story The Tiger King. (Roll No 1-15)
$\star$ Prepare a model of a clock representing different motivation words on each number. (Roll No 16-30)
$\star$ Prepare an information brochure highlighting the main programs of a function. (Roll No 31 to 45)

## 2. Documentary/PowerPoint Presentation

* Child Labour/Poverty in India (Roll No 1-15)
$\star$ Ideal Teacher/ Students' Traits for new Teaching- learning process. (Roll No 16-30)
$\star$ Tiger Reserves of India. (Roll No 31 to 45)
$\star$ To save environment: A Greater Challenge

3. Project File ( $\mathbf{1 0 - 1 5}$ pages)

## Book Review

Enjoy reading story books by renowned authors during the summer vacation. Present a book review on any one book you liked the most or any chapter you have read. Add these points:

1. Book Title and Author
2. The characters from the story
3. The main story line
4. Which character did you like the most and why?
5. The summary of the story
6. Any paintings/ sketch/ pictures depicting the characters or any part of the story
7. Also decorate a book cover for the same book

## Assignment-1

1. You are Dhruv / Deepa. Your father, Shri Dheeraj Garg of Gurugram wants you to draft an invitation to be sent to friends and relatives on the occasion of your elder sister's marriage. Prepare the invitation giving necessary details in not more than 50 words.
2. Your school is planning to organise a talk on the 'Importance of Promoting Art Education' at various levels. You plan to invite The Director, Delhi School of Art, as a Key Note Speaker. As CCA Coordinator of Vidya Mandir Vidyalaya. Draft an invitation for the same giving all the necessary details. ( 50 words)
3. Sunrise Global School, Agra is going to organise a One Act Play Competition in the school auditorium. Draft a notice in about 50 words giving information to the students to participate. You are Karuna/ Karan, Cultural Secretary.
4. Draft an invitation for the grand opening of a multispeciality hospital.
5. You have received an invitation from the Secretary, Mother's Pride Group to Preside over the function. Make a prompt reply, confirming your presence for the baby show. You are Mrs. Kapoor, Director HM college, Panipat.
6. You live in Bangalore in a hostel. Your uncle has invited you to celebrate Diwali with them. Write an informal reply accepting the invitation.
7. You are Simar / Smriti of Lotus International School, Jodhpur.Your school has decided to contribute in controlling traffic near your school and require the names of volunteers from IX to XII. Write a notice to be displayed on the notice board. ( 50 words)
8. Public demonstration causes a lot of disturbance in daily routine of common man. You almost missed your important entrance examination as people blocked the highway. As Tarun / Taruna, a student aspiring to be a doctor, write a letter to the Editor of The Times of India highlighting the need to discourage such demonstrations and disturbance by public on highways which causes a great loss of time and opportunity for many. (100-125 words)
9. Write a letter to the Editor of The News Today on the fear that is spreading among people due to their anxiety over the widespread terrorism in the world. Give suggestions to curb such anti-social activities. You are Vikram/Varsha.
10. Your school (Amar Vidyplaya) is organising a cultural evening to collect funds for the slum children. The Education Minister has consented to be the Chief Guest on the occasion. Draft a notice about it to be displayed on your school notice board. You are the school Head Boy /Head Girl. (Word limit: 50)

## Note: Do assignment in Grammar Notebook.

## (Chemistry)

Make a working model of the given topics roll no.wise
Roll no. 1 to 10- Ball and stick model of any carbon compound.
Roll no. 11 to 20-Prepare a 3 D model of buckminster fullerene.
Roll no. 21 to 30-Solar powered house
Roll no. 31 to 40- Rain water harvesting
Roll no. 41 to 50- Water purifier

## Assignement

## Solutions

## Short Answer Type Questions

1. Sodium chloride aqueous solution freezes at lower temperature than water but boils at higher temperatures than water. Explain.
2. Define
(i) Mole fraction
(ii) Molarity
3. Calculate 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 $37^{\circ} \mathrm{C}$.
4. An aqueous solution of glucose is made by dissolving 10 g of glucose $\left(\mathrm{C}_{6} \mathrm{H}_{12} \mathrm{O}_{6}\right)$ in 90 g of water at 303 K . If the vapour pressure of pure water at 303 K be 32.8 mm Hg . what would be the vapour pressure of the solution?
5. Henry Law constant for the solubility of methane in benzene at 298 K is 4.27 $\times 105 \mathrm{~mm} \mathrm{Hg}$. Calculate the solubility of methane in benzene at 298 K under 760 mm Hg .
6. When mercuric iodide is added to an aqueous solution of KI the freezing point is raised. Why?
7. State Henry's law correlating the pressure of a gas and its solubility in a solvent and mention two applications for the law.
8. 0.01 M solution of KCl and $\mathrm{BaCl}_{2}$ are prepared separately in water. The freezing points of KCl is found to be $-2^{\circ} \mathrm{C}$. What freezing point would you expect for $\mathrm{BaCl}_{2}$ solution assuming both KCl and $\mathrm{BaCl}_{2}$ to be completely ionized.
9. Calculate the number of moles of methanol in 5 liters of its 2 m solution, if the density of the solution is $0.981 \mathrm{~kg} \mathrm{litre}^{-1}$. (Molar mass of methanol of 32.0 g mol ${ }^{-1}$ ).
10. At a certain temperature, the vapour pressure of $\mathrm{CH}_{3} \mathrm{OH}$ and $\mathrm{C}_{2} \mathrm{H}_{5} \mathrm{OH}$ solution is represented by $P=119 x+135$.
where x is the mole fraction of $\mathrm{CH}_{3} \mathrm{OH}$. What are the vapour pressure of pure components of this temperature?
11. Distinguish between the boiling point of a liquid and the normal boiling point of a liquid.

## Very Long Answer Type Questions

1. The freezing point of a solution containing 0.2 g of acetic acid in 20.0 g of benzene is lowered by $0.45^{\circ} \mathrm{C}$. Calculate.
(i) The molar mass of acetic acid from this data
(ii) Van't Hoff factor [For benzene, $\mathrm{K}_{\mathrm{t}}=5.12 \mathrm{~K} \mathrm{~kg} \mathrm{~mol}^{-1}$ ]

What conclusion can you draw from the value of Von't Hoff factor obtained?
2. One litre aqueous solution of sucrose (molar mass $=342 \mathrm{~g} \mathrm{~mol}^{-1}$ )
weighing 1015 g is found to record an osmotic pressure of 4.82 atm at 293 K .
What is the molarity of the sucrose solution? $\left(R=0.0821 \mathrm{~atm} \mathrm{~L} \mathrm{~mol}{ }^{-1} \mathrm{~K}^{-1}\right)$
3. Calculate the temperature at which a solution containing 54 g of glucose, in 250 g of water will freeze. ( K , for water $=1.86 \mathrm{~K} \mathrm{~mol}^{-1} \mathrm{~kg}$ ).
4. What is meant by Van't Hoff factor?

The osmotic pressure of a 0.0103 molar solution of an electrolyte is found to be 0.70 aim at $27^{\circ} \mathrm{C}$. Calculate the Van't Hoff factor. ( $R=0.082{\left.\mathrm{~L} \mathrm{~atm}-\mathrm{mol}^{-1} \mathrm{~K}^{-1}\right)}^{\text {}}$ ) What conclusion do you draw about the molecular state of the solute in the solution?
5. Determine the amount of $\mathrm{CaCl}_{2}(\mathrm{i}=2.47)$ dissolved in 2.5 litre of water such that its osmotic pressure is 0.75 atm at $27^{\circ} \mathrm{C}$.
6. (A) Among the following compounds, identify which are insoluble, partially soluble and highly soluble in water.
(i) phenol (ii) toluene
(iii) formic acid.
(B) Based on solute-solvent interactions, arrange the following in order of increasing solubility in $n$-octane and explain.
Cyclohexane, $\mathrm{KCl}, \mathrm{CH}_{3} \mathrm{OH}, \mathrm{CH}_{3} \mathrm{CN}$
7. A solution is made by dissolving 30 g of a non-volatile solute in 90 g of water. It has a vapour pressure of 2.8 kPa at 298 K . At 298 vapour pressure of pure water is 3.64 kPa . Calculate the molar mass of the solute.
8. The boiling point elevation of 0.30 g acetic acid in 100 g benzene is 0.0633 K. Calculate the molar mass of acetic acid from this data. What conclusion can you draw about the molecular state of the solute in the solution? [Given Kb for Benzene $\left.=2.53 \mathrm{~K} \mathrm{~kg} \mathrm{~mol}^{-1}\right]$
9. Nalorphene $\left(\mathrm{C}_{19} \mathrm{H}_{22} \mathrm{NO}_{3}\right)$, similar to morphine, is used to combat withdrawal symptoms in narcotic users. Dose of nalorphine generally given is 1.5 mg . Calculate the mass of $1.5 \times 10^{-3} \mathrm{~m}$ aqueous solution required for the above dose.

## Haloalkane and Haloarene

Q1. A Grignard reagent can be prepared by reacting magnesium with
(a) Methylamine
(b) Diethyl ether
(c) Ethyl iodide
(d) Ethyl alcohol

Q2. The $\mathrm{SN}_{2}$ order for halides is
(a) $\mathrm{R}-\mathrm{F}>\mathrm{R}-\mathrm{Cl}>\mathrm{RBr}>\mathrm{RI}$
(b) $\mathrm{RI}>\mathrm{RBr}>\mathrm{RCl}>\mathrm{RF}$
(c) $\mathrm{RBr}>\mathrm{RI}>\mathrm{RCl}>\mathrm{RF}$
(d) $\mathrm{RCl}>\mathrm{RBr}>\mathrm{RF}>\mathrm{RI}$

Q3. Which of the following is ethyl dihalide?
(a) $\mathrm{CH}_{3} \mathrm{CH} \mathrm{Br}_{2}$
(b) $\mathrm{CH}_{2}(\mathrm{Br}) \mathrm{CH}_{2}(\mathrm{Br})$
(c) $\mathrm{CH}_{3} \mathrm{CH}(\mathrm{Br}) \mathrm{CH}_{2}(\mathrm{Br})$
(d) None of the above

Q4. Chloroform on reaction with conc $\mathrm{HNO}_{3}$ gives
(a) Chloropicrin
(b) Nitromethane
(c ) Picric Acid
(d) Acetylene

Q5. Alkyl halides on treatment with a suspension of $\mathrm{Ag}_{2} \mathrm{O}$ moist in ether give
(a) Alkanal
(b) Alkanol
(c) Alkanes
(d) Alkoxy alkanes

Q6. An alkyl halide $\mathrm{C}_{4} \mathrm{H}_{9} \mathrm{Cl}$ is optically active. Draw its possible structure.
Q7. Why are alkyl halides insoluble in water even though they have a polar C-X bond?
Q8. Why is sulphuric acid not used in the reaction of alcohol and KI?
Q9. Write the IUPAC name of DDT.
Q10. Mention two uses of iodoform.
Q11. What is Sandmeyer's reaction?
Q12. Write any two tests to identify the existence of a double bond in a molecule.
Q13. Convert aniline to chlorobenzene.
Q14. Why is allyl chloride hydrolysed more readily than n-propyl chloride?
Q15. Out of 2-Bromopentane, 2-Bromo-2-methylbutane, and 1-Bromopentane.
(a) Which of them will be most reactive towards SN 2 reaction?
(b) Which of them will be optically active?
(c ) Which of them will be most reactive towards beta elimination reaction?
Q16. Which one of the following compounds is more reactive toward $\mathrm{SN}_{2}$ reaction and why?
$\mathrm{CH}_{3} \mathrm{CH}(\mathrm{Cl}) \mathrm{CH}_{2} \mathrm{CH}_{3}$ and $\mathrm{CH}_{3} \mathrm{CH}_{2} \mathrm{CH}_{2} \mathrm{Cl}$
Q17. What happens when methyl bromide is treated with KCN
Q18. Why is the dipole moment of chlorobenzene less than that of cyclohexyl chloride?

Q19. Write the IUPAC name of the following compounds.
(a) $\mathrm{CH}_{3} \mathrm{CH}(\mathrm{Cl}) \mathrm{CH}(\mathrm{Br}) \mathrm{CH}_{3}$
(b) $\mathrm{CHF}_{2} \mathrm{CBrClF}^{2}$
(c) $\mathrm{ClCH}_{2} \mathrm{C}=\mathrm{CCH}_{2} \mathrm{Br}$
(d) $\left(\mathrm{CCl}_{3}\right)_{3} \mathrm{CCl}$
(e) $\mathrm{CH}_{3} \mathrm{C}\left(\mathrm{p}-\mathrm{ClC}_{6} \mathrm{H}_{4}\right)_{2} \mathrm{CH}(\mathrm{Br}) \mathrm{CH}_{3}$

Q20. The substitution reaction of alkyl halide mainly occurs by $\mathrm{SN}_{1}$ or $\mathrm{SN}_{2}$ mechanism. Whatever mechanism alkyl halides follow for the substitution reaction to occur, the polarity of the carbon halogen bond is responsible for these substitution reactions. The rate of $\mathrm{SN}_{1}$ reactions is governed by carbocation stability, whereas for $\mathrm{SN}_{2}$ reactions, the steric factor is the deciding factor. If the starting material is a chiral compound, we may end up with an inverted product or racemic mixture depending upon the type of mechanism followed by alkyl halide. Cleavage of ethers with HI is also governed by steric factors and stability of carbocation, which indicates that in organic chemistry, these two significant factors help us decide the kind of product formed.
(a) Predict the stereochemistry of the product formed if an optically active alkyl halide undergoes a substitution reaction by the $\mathrm{SN}_{1}$ mechanism.
(b) Name the instrument used for measuring the angle by which the plane polarised light is rotated.
(c) Predict the primary product formed when 2-Bromopentane reacts with alcoholic KOH .
(d) Mention one use of $\mathrm{CHI}_{3}$
(e) Write the structures of products formed when anisole is treated with HI .

## Coordination compounds

Q-1: What is the order of magnitude of $\Delta_{\circ}$ values for Cr (III) octahedral complexes with sigma donor, pi donor, and pi acceptor ligands?

Q-2: Calculate the spin only magnetic moment of the compound $\mathrm{Hg}\left[\mathrm{Co}(\mathrm{SCN})_{4}\right]$.
Q-3: How many electrons are present in the $e_{9}$ set of d-orbital of sodium nitroprusside complex?
Q-4: When bis(ethane-1,2-diamine) copper (II) sulphate is dissolved in water, calculate the number of ions formed.

Q-5: a) Identify the dark blue complex formed when $\left[\mathrm{Fe}(\mathrm{CN})_{6}\right]^{3}$. is treated with ferrous sulphate and account for the origin of its colour.
b) What is the common name for the formed complex?

Q-6: A coordination compound is made up of one $\mathrm{Co}(\mathrm{III})$, one chloride, one sulphate, and four ammonia molecules. When combined with aqueous $\mathrm{BaCl}_{2}$, the compound's aqueous solution yields no precipitate, whereas a precipitate is formed when combined with aqueous $\mathrm{AgNO}_{3}$ solution. Draw its structure and use chemical equations to explain the observations.

Q-7: Define the following:

1. Heteroleptic complex:
2. Coordination Isomerism

Q-8: List two limitations of CFT.
Q-9: What is the synergic effect? How does it improve the bond between CO and metal?
Q-10: How will you account for ruby's red colour?
Q-11: When potassium oxalate solution is added to a hot solution of potassium dichromate containing dilute sulfuric acid, effervescence occurs and potassium trisoxalatochromate(III) is formed.
i) Write the chemical formula of the formed chromium complex.
ii) Determine the complex's room temperature spin only magnetic moment in B.M.

## Physical Education

* Unit -1

Management of sporting Events Learn.

* Unit -2

Children and women in sports learn and write.

* Unit -3

Yoga as preventive measure for lifestyle disease Learn and write.

* Unit - 4 write in your fair note book.
* Project for holiday homework

Yoga Asanas .
10 to 15 yoga asanas with Surya namaskar do on A4 size sheet.

* Unit Test July - chapter 2- Children and women in sports learn for unit test.
* Unit Test July - chapter 3- Yoga as preventive measure for lifestyle disease learn for unit test .
* Unit Test July - chapter 4- Physical Education and Sports for CWSN.


## PHYSICS

Q1. Draw an equipotential surface:
(a) In a uniform electric field
(b) For a point charge <0.

Q2.How will the capacitance of a capacitor change when a dielectric slab is introduced between the plates of a
capacitor?
Q3. How does the resistivity of a conductor depend upon the number density of free electrons and temperature?

Q4. Show mathematically that the potential at a point on the equatorial line of an electric dipole is zero.

Q5. A hollow metal sphere of radius 5 cm is charged such that the potential on its surface is 10 V . What is the
potential at the center of the sphere?
Q6. A charge of 12 C is given to hollow metallic sphere of radius 0.1 m . Find the potential at (i) the surface of the
sphere (ii) center of the sphere.
Q7. Calculate the Coulomb force between a proton and an electron separated by $0.8 \times \mathbf{1 0 - 1 5} \mathbf{m}$.

Q8 Calculate the Value of electric field exactly balancing the weight of an electron.

Q9.Two capacitors 3 farad \& 6 farad are connected in series with 6 V battery. Which one will have higher potential?

Q10. Calculate the net capacitance of the given network, if each capacitor is 5 microfarad.
Q11. If the plates of a charged capacitor are further separated while the capacitor is still connected to the charging battery, what will happen to the energy?

Q12. How does a torque affect the dipole in an electric field?
Q13. 27 drops of same size are charged at 220V each. They collapse to form a bigger drop. Calculate the potential of the bigger drop.

Q14. Draw a plot showing the variation of electric field \& potential with distance due to a point charge. Q16.A wire of resistance 5 ohm is drawn out so that its length is increased to twice its original length. Calculate its original resistance.

Q15. A lamp of 100 W works at 220 volt calculates its resistance \& current capacity?

Q16. Why are thick copper wires used as connecting wire?
Q17. Define resistivity of the material of a wire. State its S.I. unit. Q21. The storage battery of a car has an E.M.F. of 12 V . If the internal resistance of the battery is 0.4 ohm, what is the maximum current that can be drawn from the battery?

Q18. Three charges $+Q, q,+Q$ are placed respectively, at distance $0, d / 2$ and $d$ from the origin, on the $x$-axis. If the net force experienced by $+Q$ placed at $x=0$ is zero, then value of $q$ is
(a) $+Q / 4$
(b) $-Q / 2$
(c) $+Q / 2$
(d) $-Q / 4$

Q19. A parallel plate capacitor having capacitance 12 pF is charged by a battery to a potential difference of 10 V between its plates. The charging battery is now disconnected and a porcelain slab of dielectric constant 6.5 is slipped between the plates. The work done by the capacitor on the slab is
(a) 508 pJ
(b) 692 pJ
(c) 560 pJ
(d) 600 pJ

Q20. An electric field of $1000 \mathrm{~V} / \mathrm{m}$ is applied to an electric dipole at an angle of $45^{\circ}$. The value of the electric dipole moment is $10^{-29} \mathrm{Cm}$. What is the potential energy of the electric dipole?
(a) $-10 \times 10^{-29} \mathrm{~J}$
(b) $-7 \times 10^{-27} \mathrm{~J}$
(c) $-20 \times 10^{-18} \mathrm{~J}$
(d) $-9 \times 10^{-20} \mathrm{~J}$

Q21. A solid conducting sphere, having a charge $\mathbf{Q}$, is surrounded by an uncharged conducting hollow spherical shell. Let the potential difference between the surface of the solid sphere and that of the outer surface of the hollow shell be $V$. If the shell is now given a charge of $-4 Q$, the new potential difference between the same two surfaces is
(a) 4 V
(b) V
(c) 2 V
(d) -2 V

Q22. Voltage rating of a parallel plate capacitor is 500 V . Its dielectric can withstand a maximum electric field of $106 \mathrm{~V} \mathrm{~m}^{-1}$. The plate area is $10^{-4} \mathrm{~m}^{2}$. What is the dielectric constant if the capacitance is 15 pF ? (given $0=8.86 \times 10^{-12} \mathrm{C}^{2} \mathrm{~N}^{-}$ ${ }^{1} \mathrm{~m}^{-2}$ )
(a) 3.8
(b) 8.5
(c) 6.2
(d) 4.5

Q23. The bob of a simple pendulum has a mass of 2 g and a charge of 5.0 C . It is at rest in a uniform horizontal electric field of intensity $2000 \mathrm{~V} \mathrm{~m}^{-1}$. At equilibrium, the angle that the pendulum makes with the vertical is (take $\mathrm{g}=10$ $\mathrm{m} \mathrm{s}^{-2}$ )
(a) $\tan ^{-1}(0.2)$
(b) $\tan ^{-1}(0.5)$
(c) $\tan ^{-1}(2.0)$
(d) $\tan ^{-1}(5.0)$

Q24. A parallel plate capacitor has 1 F capacitance. One of its two plates is given +2 C charge and the other plate, +4 C charge. The potential difference developed across the capacitor is
(a) 3 V
(b) 2 V
(c) 5 V
(d) 1 V

Q26. A capacitor with a capacitance $5 \mu \mathrm{~F}$ is charged to $5 \mu \mathrm{C}$. If the plates are pulled apart to reduce the capacitance to $2 \mu \mathrm{~F}$, how much work is done?
(a) $6.25 \times 10^{-6} \mathrm{~J}$
(b) $3.75 \times 10^{-6} \mathrm{~J}$
(c) $2.16 \times 10^{-6} \mathrm{~J}$
(d) $2.55 \times 10^{-6} \mathrm{~J}$

Q27. A parallel plate capacitor of capacitance 90 pF is connected to a battery of emf 20 V . If a dielectric material of dielectric constant $K=5 / 3$ is inserted between the plates, the magnitude of the induced charge will be
(a) 1.2 nC
(b) 0.3 nC
(c) 2.4 nC
(d) 0.9 nC

Q28. A parallel plate capacitor of capacitance 90 pF is connected to a battery of emf 20 V . If a dielectric material of dielectric constant $K=5 / 3$ is inserted between the plates, the magnitude of the induced charge will be
(a) 1.2 nC
(b) 0.3 nC
(c) 2.4 nC
(d) 0.9 nC

Q29. Two identical conducting spheres A and B, carry equal charge. They are separated by a distance much larger than their diameters, and the force between them is F . A third identical conducting sphere, C , is uncharged. Sphere $C$ is first touched to $A$, then to $B$, and then removed. As a result, the force between $A$ and $B$ would be equal to
(a) $3 F / 8$
(b) $F / 2$
(c) $3 F / 4$
(d) F

Q30. Two capacitors $\mathrm{C}_{1}$ and $\mathrm{C}_{2}$ are charged to 120 V and 200 V , respectively. It is found that by connecting them together the potential on each one can be made zero. Then
(a) $9 \mathrm{C}_{1}=4 \mathrm{C}_{2}$
(b) $5 \mathrm{C}_{1}=3 \mathrm{C}_{2}$
(c) $3 \mathrm{C}_{1}=5 \mathrm{C}_{2}$
(d) $3 \mathrm{C}_{1}+5 \mathrm{C}_{2}=0$

Q31. An electric dipole is placed at an angle of 300 to a non-uniform electric field. The dipole will experience
(a) a torque only
(b) a translational force only in the direction of the field
(c) a translational force only in a direction normal to the direction of the field
(d) a torque as well as a translational force

Q32.A parallel plate capacitor is made of two circular plates separated by a distance of 5 mm and with a dielectric of dielectric constant 2.2 between them. When the electric field in the dielectric is $3 \times 10^{4} \mathrm{~V} / \mathrm{m}$, the charge density of the positive plate will be close to
(a) $6 \times 10^{4} \mathrm{C} / \mathrm{m}^{2}$
(b) $6 \times 10^{-7} \mathrm{C} / \mathrm{m}^{2}$
(c) $3 \times 10^{-7} \mathrm{C} / \mathrm{m}^{2}$
(d) $3 \times 10^{4} \mathrm{C} / \mathrm{m}^{2}$

Q33. Three concentric metallic spherical shells of radii $\mathbf{R}, \mathbf{2 R}, 3 \mathrm{R}$, are given charges $Q_{1}: Q_{2}: Q_{3}$ respectively. It is found that the surface charge densities on the outer surfaces of the shells are equal. Then, the ratio of the charges given to the shells, $\mathrm{Q}_{1}: \mathrm{Q}_{2}: \mathrm{Q}_{3}$
(A) $1: 2: 3$
(B) $1: 3: 5$
(C) $1: 4: 9$
(D) $1: 8: 18$

Q34. An electric field
exists in a region of space. If the potential at the origin is taken to be zero then the potential at $x=\mathbf{2 m}, y=2 m$ is
(A) -110 J
(B) -140 J
(C) -120 J
(D) -130 J

Q35. Assume that an electric field
exists in space. Then the potential difference $V_{A}-V_{0}$, where $V_{0}$ is the potential at the origin and $V_{A}$ the potential at $x=2 \mathrm{~m}$ is
(A) 120 J/C
(B) $-120 \mathrm{~J} / \mathrm{C}$
(C) $-80 \mathrm{~J} / \mathrm{C}$
(D) $80 \mathrm{~J} / \mathrm{C}$

Q36. A hollow metal sphere of radius 5 cm is charged such that the potential on its surface is 10 volts. The potential at the centre of the sphere is
(A) zero
(B) 10 volts
(C) same as at a point 5 cm away from the surface
(D) same as at a point 25 cm away from the surface

Q37. Concentric metallic hollow spheres of radii $R$ and 4R hold charges Q1 and Q2 respectively. Given that the surface charge density of the concentric spheres are equal, the potential difference $V(R)-V(4 R)$ is
(A) $3 Q_{1} / 16 \pi \varepsilon_{0} R$
(B) $3 Q_{2} / 4 \pi \varepsilon_{0} R$
(C) $Q_{2} / 4 \pi \varepsilon_{0} R$
(D) $3 Q_{1} / 4 \pi \varepsilon_{0} R$

Q38. A charge $Q$ is divided into $q$ and $(Q-q)$. If $Q / q=x$, such that the repulsion between them is maximum, find $x$.
(A) 1
(B) 2
(C) 3
(D) 4

Q39. Two point charges $+q$ and $-q$ are held fixed at $(-d, 0)$ and $(d, 0)$ respectively of a $x-y$ coordinate system. Then
a)The electric field $E$ at all points on $x$-axis has the same direction
b)Electric field at all points on $y$-axis is along $x$-axis
c) Work has to be done in bringing a test charge from infinity to the origin
d) The dipole moment is $2 q d$ along the $x$-axis

Q40. A parallel plate capacitor of capacitance $C$ is connected to a battery and is charged to a potential difference $V$. Another capacitor of capacitance 2C is
similarly charged to a potential difference $\mathbf{2 V}$. The charging battery is now disconnected and the capacitors are connected in parallel to each other in such a way that the positive terminal of one is connected to the negative terminal of the other. The final energy of the configuration is
a) zero
b) $\frac{3}{2} \mathrm{CV}^{2}$
c) $\frac{25}{6} \mathrm{CV}^{2}$
d) $\frac{9}{2} \mathrm{CV}^{2}$

## Activity

Make a working project on the topic of method of charging
Make a chart on any practical topic of your choice.

## Mathematics

Revise:- Chapter 5,6,12 for unit test prepartion thoroughly
Revise:- Chapter CONTINUITY AND DIFFERENTIABILITY and APPLICATIONS OF DERIVATIVES from exemplar book ON A SEPARATE NOTEBOOK.

Do the following activities in lab manual.

## Activity 6:-Principal value of an inverse trigonometric function. <br> Activity8:-Relation between common logarithm and natural logarithm.

## Activity 9:-Continuity and discontinuity of a function at a point.

Activity 10:-Differentiability of a function at a point.
Activity 14:-Local Maximum and Local minimum value of a function.

## Activity 15:-Absolute maximum and Absolute minimum values of a function.

## Activity 16:- Word problem on maxima and minima.

## TYPOGRAPHY \& COMPUTER APPLICATION

1. Learn chapters $1,2,3,4,5,6,7$ of part-B and do written practice in separate holiday home work note book.
2. Create a practical file including following points :
3. Write a General letter and convert the letters into different styles as Indented style, blocked style, and semi -block style.
4. Write a memorandum to an employee of the institute for the confirmation of his/her job to the post of junior secretariat assistant (JSA).
5. Draft on office order for an employee for grant/sanction of earned leave for a period of 5 days.
6. Write a D.O (Demi-Official) letter from the principal of the school to directorate of education registering a complain of the staff member.
7. Draft on office note inviting the teachers of the school for an urgent assembly in the auditorium.
8. Practice of different passage with different manuscripts signs.
9. Create a PowerPoint presentation on any festival. (6-8 slides).
10. Create a PowerPoint presentation on any sports ( $6-8$ slides).
11. Create a Student Worksheet for 10 students with Name, Roll no, Department, Marks.

Calculate the Total, Percentage
10. Create a Student Worksheet for 10 students with Name, Roll no, Department, Marks. Calculate the Total and Grade If Total marks > 350 Grade A < 350 and $>200$ Grade B < 200 Grade C
11. Create an Employee Worksheet with Basic Salary and calculate HRA, DA, Total Salary. HRA = $24 \%$ of Basic Salary DA $=35 \%$ of Basic Salary Total Salary = Basic Salary + HRA + DA
12. Create a Store Worksheet with Item number, Item name, Quantity, Price. Calculate the Amount. (Amount = Quantity*Price).

Note : After completion submit hardcopy of above practical work ,work should be compiled in single file.
2. July UT syllabus - Part -B complete
(1-7) Chapters

## INFORMATICS PRACTICES

1. Prepare hand written project file of PYTHON which contains following practicals :
a. At least 20 programs of PANDAS.
b. At least two practicals of import /export CSV files .
c. At least 4 practicals of matplotlib
2. Read and learn PANDAS, Matplotlib and MYSQL do practice of unsolved assignments in separate holiday homework notebook.
3. Make a Power point presentation on attributes of Series and Dataframe
4. July UT syllabus -Pandas,Matplotlib, MySQL
