

Class – XII

MATHEMATICS



P.G. Senior Secondary School 10+2

Affiliated To CBSE, New Delhi

SUMMER HOLIDAYS HOMEWORK

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Submitted By: _____

Dear Students,

Summer Vacation is really a time duration that brings a lot of joy and new things for you. But this duration is not only for entertainment. It is the time period when you spend your maximum time in your family. Hence, you should try your level best to focus on the values that are taught only in the family or School.

There are some suggestive points for you with an expectation that you will follow without any excuse.

You are suggested to –

- ❖ Do Your Vacation Work by yourself.
- ❖ Avoid separates Note Book for Assignment
- ❖ Write Good, Neat and Clean.
- ❖ Use a file to settle the Pages of Assignment.
- ❖ Do all the work with Day and Date.
- ❖ Avoid playing in the Sunshine or Hot Places.
- ❖ Try to pray God daily.
- ❖ Pay special attention towards your Health and Caring.
- ❖ Touch the Feet of your Parents, Grand Parents and other Elders of your family at least two times in a day (Morning & Night)

Request to Parents:

- ❖ Holidays homework should be done by the child, under parental guidance.
- ❖ The child should have a fixed time daily, for doing the assignments.
- ❖ Nurture your child's interest – be it art, music, dance or anything else.
- ❖ Let him/her pursue a hobby of his /her own choice.
- ❖ Please train your child to become independent in his daily chores.

Please Involve child at home in the following tasks –

- ❖ Help to keep the house clean- clear toys, books or craft after they finish playing.
- ❖ Help your mother to set and clear the dining table.
- ❖ Remember to converse in English.
- ❖ Be polite while speaking and talk softly.

To enhance children's creativity and innovation for the progressive learning. Help your child to do the following:

- ❖ **Morning Blessings:** Help your child inculcate good habits like doing "Surya Pranam" & encourage him/her to greet all elders in the morning.
- ❖ **Fun in Knowing:** Tell the child about your childhood, share incidents from the past and show him/her old family albums. This will strengthen the bond between you and your child.
- ❖ **Fun with Books:** Read English and Hindi stories to your child with morals.
- ❖ **Fun with family:** Make use of these holidays and spend quality time together as a family and make your child feel special.
- ❖ **Fun with Parents:** Cook dinner together. Show your child how to measure 1 cup, 1/2, 1teaspoon etc. Start naming the food groups, when you serve them.
- ❖ **Go for shopping together:** Tell your child about market and mall differences, about the things, items and material purchased from there.
- ❖ Let your child help in your household chores like cleanings, dusting and many more.
- ❖ Have walk together and talk to your child about what he/she likes and dislikes etc.
- ❖ Help your child to memorize the home address and your phone numbers too.
- ❖ Help your child in learning how to open and close his/her water bottle, lunch box.

Subject – English**1. Read the passage**

1. Have you ever failed at something so miserably that the thought of attempting to do it again was the last thing on your mind?

2. If your answer is yes, then you should understand that you are not a robot. Unlike robots, we human beings have feelings, emotions, and dreams. We are all meant to grow despite our circumstances and limitations. Flourishing and trying to make our dreams, come true feels great when life goes our way. But what happens when it does not? What happens when you fail despite all your hard work? Do you stay down and accept defeat or do you get up again? If you tend to persevere and keep going, you have what experts call 'grit'.

3. Falling down or failing is one of the most agonising, embarrassing, and scary human experiences. But it is also one of the most educational, empowering, and essential parts of living a successful and fulfilling life. Did you know that perseverance (grit) is one of the seven qualities that has been described as the key to personal success and betterment in society? The other six are curiosity, gratitude, optimism, self-control, social intelligence, and zest. Thomas Edison is an example of grit for trying more than 1,000 times to invent the light bulb. If you are reading this with the lights on in your room, you will realise the importance of his success. When asked why he kept going despite hundreds of failures, he merely stated that they had not been failures, they were hundreds of attempts towards creating the light bulb. This statement not only revealed his grit but also his optimism for looking at the bright side.

4. Grit can be learnt to help you become more successful. One of the techniques that help is mindfulness. Mindfulness is a practice that makes an individual stay at the moment by bringing awareness of his or her experience without judgement. This practice has been used to quieten the noise of fears and doubts. Through this simple practice of mindfulness, individuals have the ability to stop the self-sabotaging downward spiral of hopelessness, despair, and frustration.

5. What did you do to overcome the negative and self-sabotaging feelings of failure? Reflect on what you did, and try to use those same powerful resources to help you today. Moral: Learn from your Mistakes

On the basis of your understanding of the passage, answer any ten questions from the twelve that follow:

(i) The reason why you are not a robot is that:

- (a) You fail miserably at tasks
- (b) Failure and success can affect your emotions
- (c) You work hard
- (d) You have limitations

(ii) Choose the option that best captures the central idea of the passage from the given quotes.

“What is the point of being alive if you don’t at least try to do something remarkable?”

(1) John Green

“Mistakes are the portals of discovery.”

(2) James Joyce

“Failure should be our teacher, not our undertaker. Failure is delay, not defeat. It is a temporary detour, not a dead end.”

(3) Denis Waitley

“A person who never made a mistake never tried anything new.”

(4) Albert Einstein

(a) Option (1)

(b) Option (2)

(c) Option (3)

(d) Option (4)

(iii) What is the tone of the following context: “Falling down or failing is one of the most... educational, empowering, and essential parts of living a successful and fulfilling life.”?

a) Humorous

(b) Optimistic

(c) Horrifying

(d) Solemn

(iv) Which of the following is relevant for the title of the passage.

(a) Dreams Always Come True

(b) Failure and Grit Go Hand in Hand

(c) Humans vs Robots

(d) Falling Down and Getting Up

(v) was created after many attempts.

(a) electricity

(b) light bulb

(c) current

(d) tube light

(vi) Which of the following sentences makes the correct use of “grit”, as used in the passage?

(a) Get rid of that grit in your shoes.

(b) She had a bit of grit in her eye.

(c) The road had been covered with grit.

(d) Her grit never made her give up.

(vii) To develop perseverance one must:

(a) become more aware

(b) work hard

(c) be in the moment and be aware without judgement

(d) seek guidance

(viii) How does mindfulness help?

(a) It creates awareness

(b) It quietens the noise of fears and doubts

(c) It helps one become successful

(d) It helps develop focus

(ix) What do you understand from this line, “Falling down or failing is one of the most agonising, embarrassing, and scary human experiences.”?

(a) Falling down makes us angry.

(b) Failure can deeply affect our emotions

(c) Stay positive and be optimistic

(d) Self-control is empowering

(x) Choose the option that correctly states the meaning of 'social intelligence' as implied in the passage:

- (a) Knowing others (b) Knowing oneself and others
 (c) Knowing oneself (d) Knowing one's surroundings

(xi) The importance of perseverance and optimism for a successful and fulfilling life is explained using the example of?

- (a) Thomas Edison (b) Flourishing
 (c) Grit (d) Limitations

(xii) What is the message conveyed in the last paragraph of the passage?

- (a) Always aim for the best (b) Live life king size
 (c) Through mindfulness we can overcome the negative impact of failure
 (d) Social intelligence is crucial for a successful life

2. While walking in a park in your neighborhood you found a small plastic bag containing some documents and some cash. Write a notice in about 50 words to be put on the park notice board asking the owner to identify and collect it from you. You are Amar/Amrita 9399123456.

3. You are Bharat/Bharti of Safdarjung Development Area, New Delhi. You are deeply saddened by the attacks on elderly persons who live alone. Write a letter to the editor of 'The New India News' with 100-120 words making people aware of the authorities to guarantee that such attacks do not occur.

4. Hard work and punctuality are essential for a happy and successful life. They help in meeting the desired targets of our life. You are Kavya/Kanha. Write an article for your school magazine in 150 – 200 words highlighting the importance of hard work and punctuality in a student's life.

5. Read the extract and answer the questions that follow.

When I passed the town hall there was a crowd in front of the bulletin board. For the last two years, all our bad news had come from there, the lost battles, the draft, the orders of the commanding officer and I thought to myself without stopping "What can be the matter now?"

i. Why was there a huge crowd in front of the bulletin board?

- (a) Due to bad news
 (b) Due to order from Berlin
 (c) Due to introduction of new language
 (d) All of these

ii. What was the bulletin board famous for?

- (a) Good News

- (b) Bad News
- (c) Neither good nor bad
- (d) Either good or bad

iii. Who is the author of 'The Last Lesson'?

- (a) Selma Lagerlof
- (b) Stephen Spender
- (c) Alphonse Daudet
- (d) John Updike

iv. What does the word 'Draft' mean here?

- (a) Compulsory Military Service
- (b) Drawing
- (c) Designs of Alsace and Lorraine
- (d) Both a and b

6. Read the extract and answer the questions that follow Driving from my parent's home to Cochin last Friday morning, I saw my mother, beside me, doze, open mouthed, her face ashen like that of a corpse and realized with pain that she was as old as she looked but soon put that thought away...

i. The poet described her mother as

- (a) beautiful as rose
- (b) young and charming
- (c) old and pale
- (d) kind and loving

ii. "her face ashen like that of a corpse and realized with pain..."

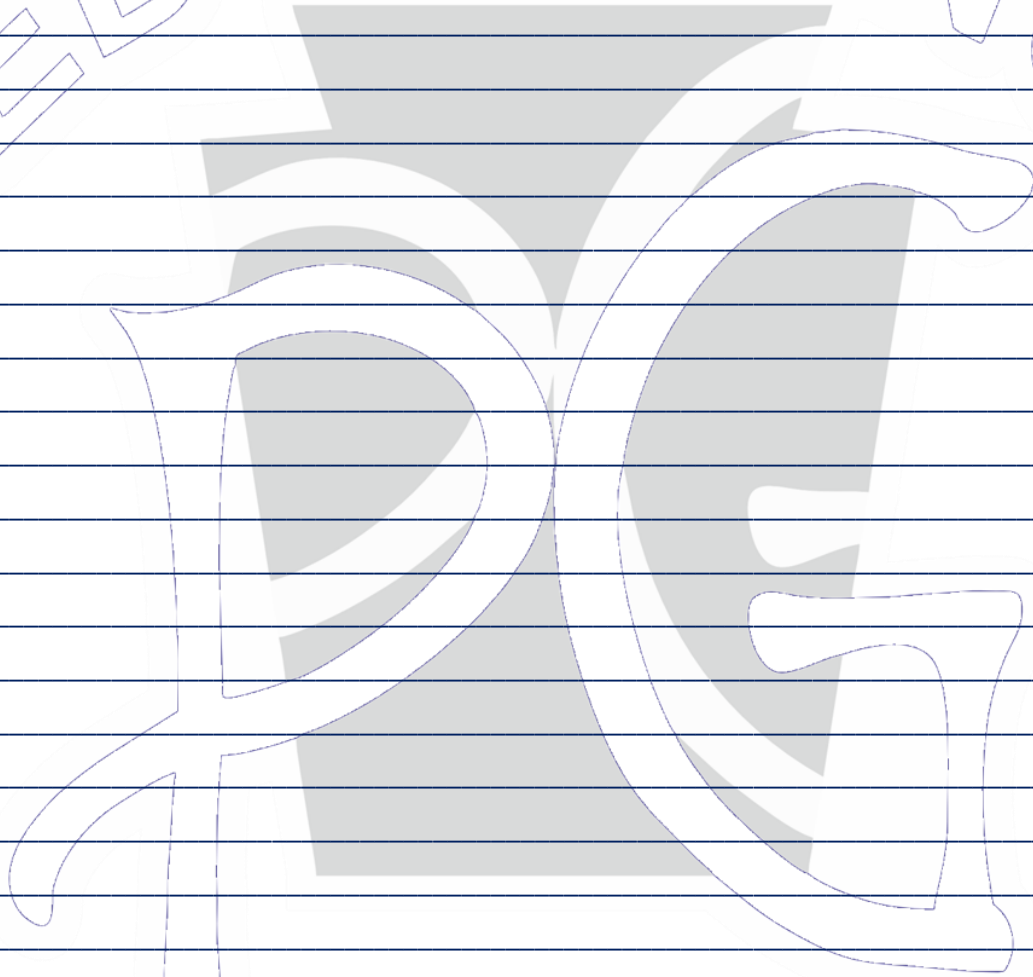
Which poetic device is used in the given lines?

- (a) Metaphor
- (b) Alliteration
- (c) Simile
- (d) Personification

iii. Choose the option that best applies to the given extract.

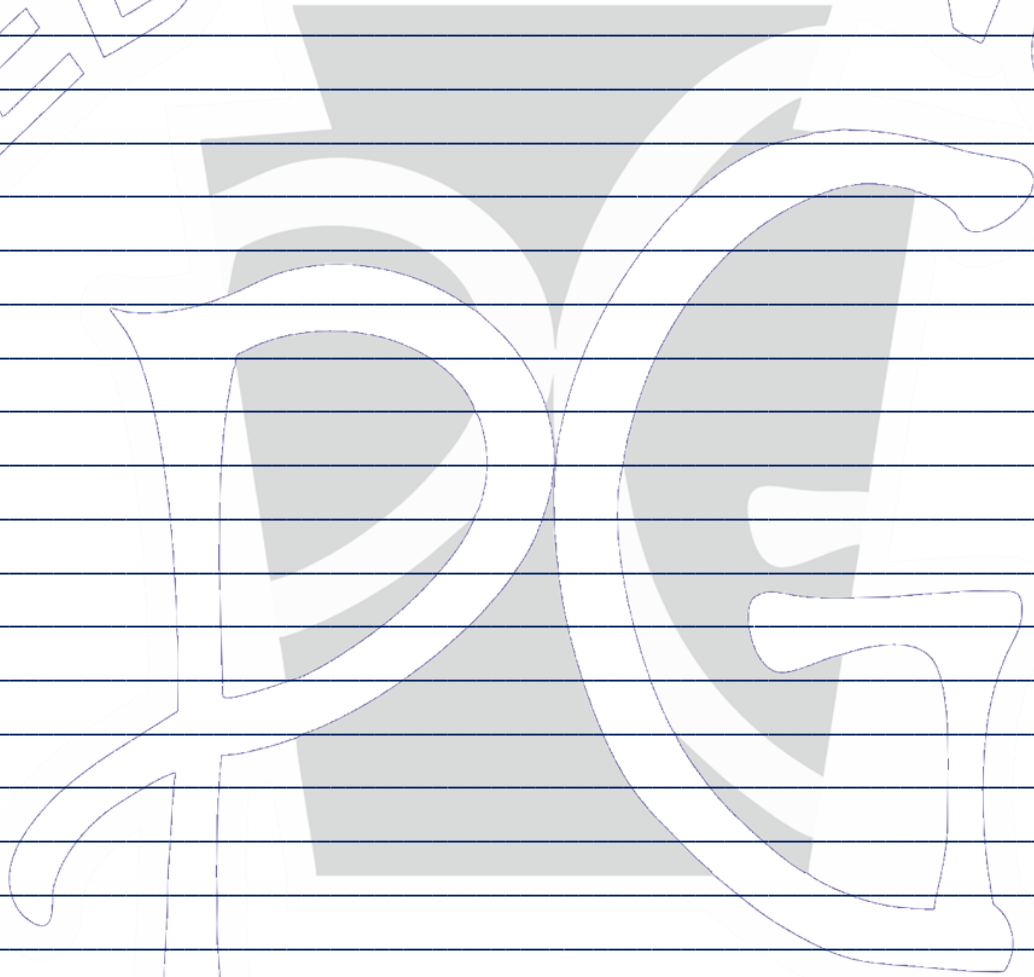
- (1) a request
- (2) an order
- (3) a piece of advice
- (4) an argument
- (5) a recollection
- (6) a suggestion
- (a) 1, 3 and 6

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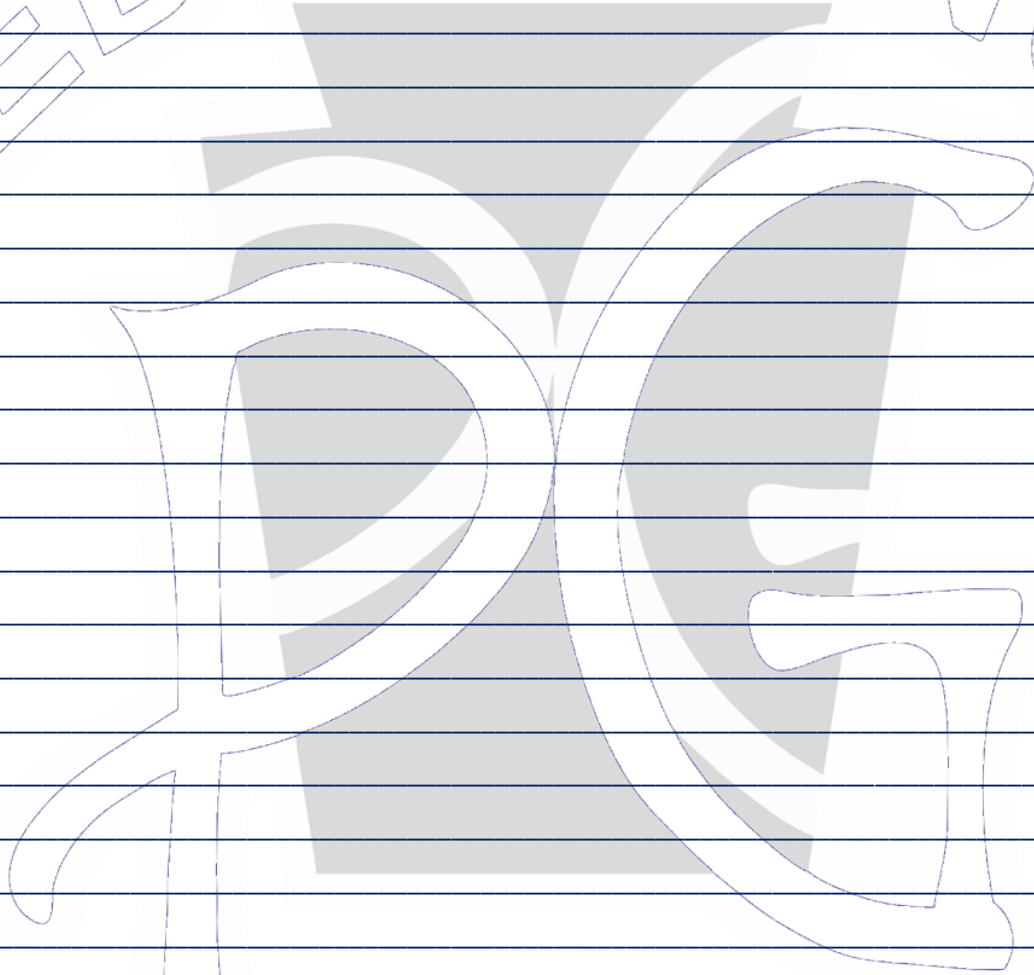
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Subject – Mathematics**Relation and function**

1. Consider two non-empty set $A = \{a, b, c\}$ and $B = \{p, q, r, s\}$. An Ordinary Relation R is defined from A to B .

Answer the following question.

- A. Find the binary set $A \times B$.
- B. Find the binary set $B \times A$ also.
- C. Are $A \times B$ and $B \times A$ equal?
- D. What is the cardinality of the set $A \times B$?
- E. What is the cardinality of the set $B \times A$?
- F. Do the cardinalities of $A \times B$ and $B \times A$ equal?
- G. What do you mean by the Power set of $A \times B$?
- H. Find the cardinality of $P(A \times B)$.
- I. How many relations are possible from A to B ?
- J. Write the smallest and largest relations from A to B .
- K. Among all the relations possible from A to B how many are functions from A to B ?
- L. From all possible functions from A to B how many of these are injective function i.e. one – one function?
- M. How many surjective i.e. Onto function do exist here from A to B ?
- N. Does any invertible function exist here from A to B ?

2. Consider a non-empty set $A = \{1, 2, 3\}$. Cartesian product of set A i.e. $A \times A$ is called a binary set. Now a Binary relation R is defined on A .

Answer the following question.

- A. Find the binary set $A \times A$.
- B. What is the cardinality of the set $A \times A$?
- C. What do you mean by the Power set of $A \times A$?
- D. Find the cardinality of $P(A \times A)$.
- E. How many relations are possible from A to A ?
- F. Write the smallest and largest relations from A to A .
- G. How many Partitions can be done for the set A ?
- H. How many Equivalence relations are possible on the set A ? List all those equivalence relations.
- I. From the above obtained list verify that union of two equivalence relations need not be an equivalence relation.
- J. Write the smallest equivalence relation possible in A .
- K. Show that intersection of two equivalence relation is always an equivalence relation.
- L. How many relations on A are reflexive?
- M. How many relations on A are reflexive only?
- N. How many relations on A are symmetric?

- O. How many relations on A are symmetric but not reflexive?
 P. How many relations on A are reflexive but not symmetric ?
 Q. Among all the relations possible from A to A, how many are functions defined on A?
 R. From all possible functions from A to A how many of these are injective function i.e. one – one function?
 S. How many surjective i.e. Onto function do exist here from A to A?
 T. How many surjective functions are available on the set A ?
 U. Does any invertible function exist here from A to B?

3. Consider a non-empty set $A = \{ 1, 2, 3, 4 \}$. Now a Binary relation R is defined on A. A. Find the binary set $A \times A$.

- B. How many relations are possible from A to A?
 C. How many Partitions can be done for the set A?
 D. How many Equivalence relations are possible on the set A?
 E. From all possible functions from A to A how many of these are injective function i.e. one – one function?
 F. How many surjective i.e. Onto function do exist here from A to A?
 G. How many bijective functions are available on the set A?
 H. Does any invertible function exist here from A to B?

4. Let Z be the set of all integers and R be the relation on Z defined as

$R = \{(a, b) : a, b \in Z \text{ and } (a - b) \text{ is divisible by } 5\}$. Prove that R is an equivalence relation. Write all possible equivalence classes available here.

- A. Are these classes mutually exhaustive?
 B. Are these classes mutually exclusive?
 C. If two elements are taken from two distinct classes. Are these element related to each other.
 it.

5. Let $f: N \rightarrow N$ be defined by $f(n) = \begin{cases} \frac{n+1}{2}, & \text{if } n \text{ is odd} \\ \frac{n}{2}, & \text{if } n \text{ is even.} \end{cases}$

For all $n \in N$. Find whether the function is bijective ?

6. If $f: R \rightarrow R$ be defined by $f(x) = (3 - x^2)^{1/3}$ then find $f \circ f$.
 7. Consider $f: R_+ \rightarrow [-5, \infty)$ given by $f(x) = 9x^2 + 6x - 5$. Show that f is invertible with $f^{-1}(y) = \frac{\sqrt{y+6}-1}{3}$.
 8. Let $A = R - \{3\}$ and $B = R - \{1\}$. Consider the function $f: A \rightarrow B$ defined by $f(x) = \frac{x-2}{x-3}$. Show that f is one-one and onto and hence find f^{-1} .

Inverse Trigonometric Function

9. Write the principle value of (i) $\cos^{-1} \frac{1}{2} - 2 \sin^{-1}(-\frac{1}{2})$. (ii) $\tan^{-1} \sqrt{3} - \sec^{-1}(-2)$. (iii) $\cos^{-1} \cos \frac{7\pi}{6}$.
 10. If $0 < x < 1$, then solve the following for x, $\tan^{-1}(x + 1) + \tan^{-1}(x - 1) = \tan^{-1} \frac{8}{31}$
 11. Evaluate: i) $\tan^{-1}(\tan 5\pi/3)$, ii) $\sec^{-1}(\sec 5\pi/3)$,
 iii) $\cos^{-1}(\cos(-\frac{7\pi}{3}))$, iv) $\sin^{-1}(\sin 17\pi/8)$, v) $\cot^{-1}(\cot \frac{7\pi}{8})$.
 12. Prove that: $2 \tan^{-1} \frac{1}{5} + \sec^{-1} \frac{5\sqrt{2}}{7} + 2 \tan^{-1} \frac{1}{8} = \frac{\pi}{4}$.

Matrix Algebra

13. If $A = \begin{bmatrix} 3 & -4 \\ 1 & -1 \end{bmatrix}$, then prove that $A^n = \begin{bmatrix} 1 + 2n & -4n \\ n & 1 - 2n \end{bmatrix}$, where n is a positive integer.

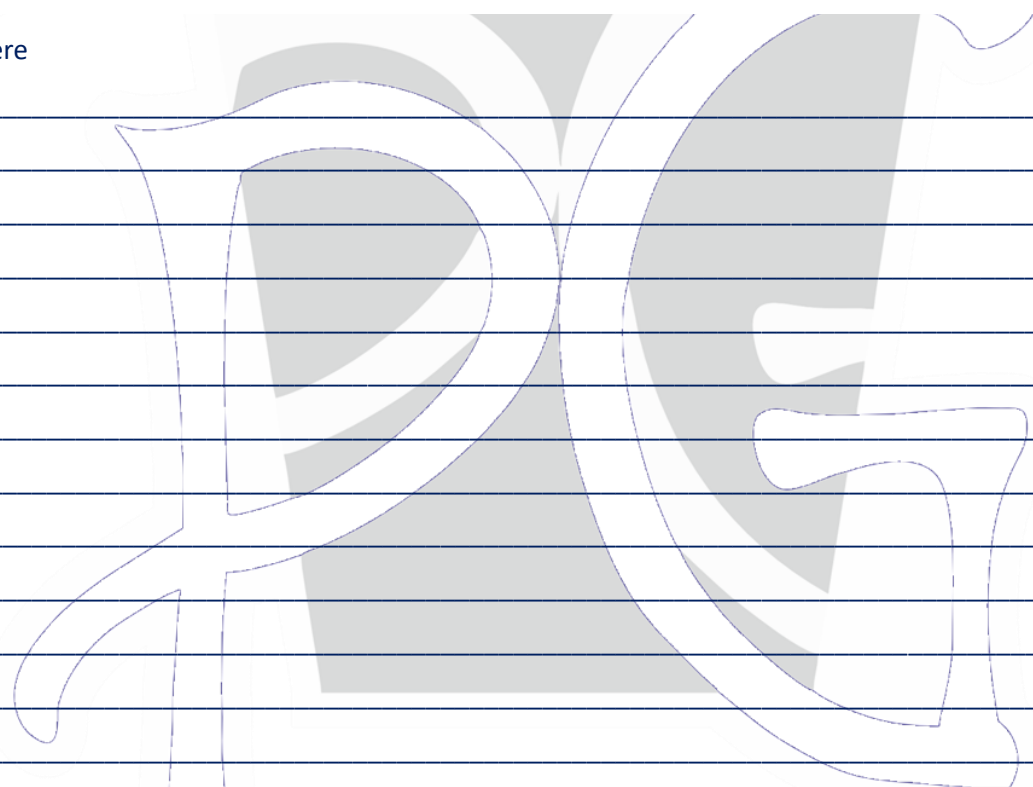
14. Show that $(AB - BA)$ is a skew symmetric matrix for every square matrix A and B .

15. Express the matrix $A = \begin{bmatrix} 1 & 3 & 5 \\ -6 & 8 & 3 \\ -4 & 6 & 5 \end{bmatrix}$ as the sum of a symmetric and a skew symmetric matrix.

16. Solve by matrix method, $5x + 3y + z = 16$, $2x + y + 3z = 19$ and $x + 2y + 4z = 25$.

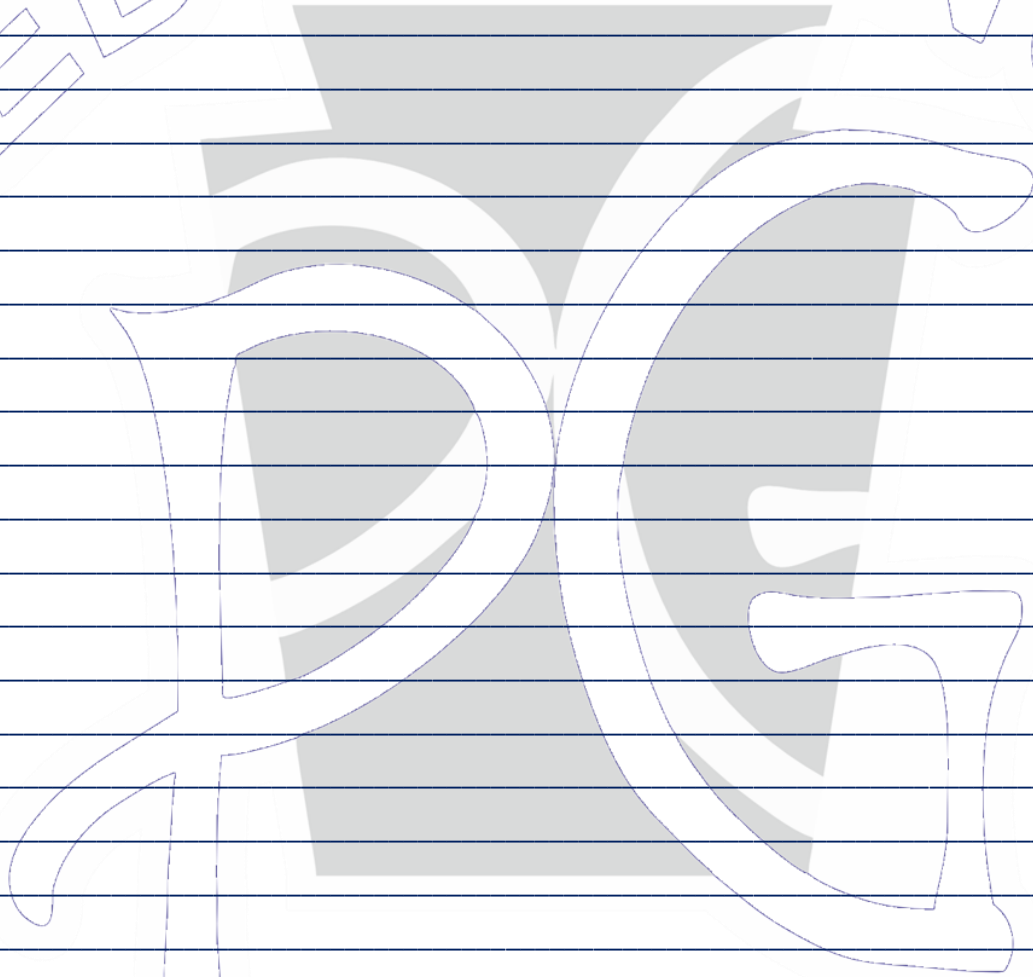
17. If $A = \begin{bmatrix} 1 & 1 & 1 \\ 2 & -1 & 1 \\ 1 & -2 & 3 \end{bmatrix}$ Find A^{-1} . Using A^{-1} solve the following system of linear equations $x + y + z = 3$, $2x - y + z = 2$ and $x - 2y + 3z = 2$.

Write From Here



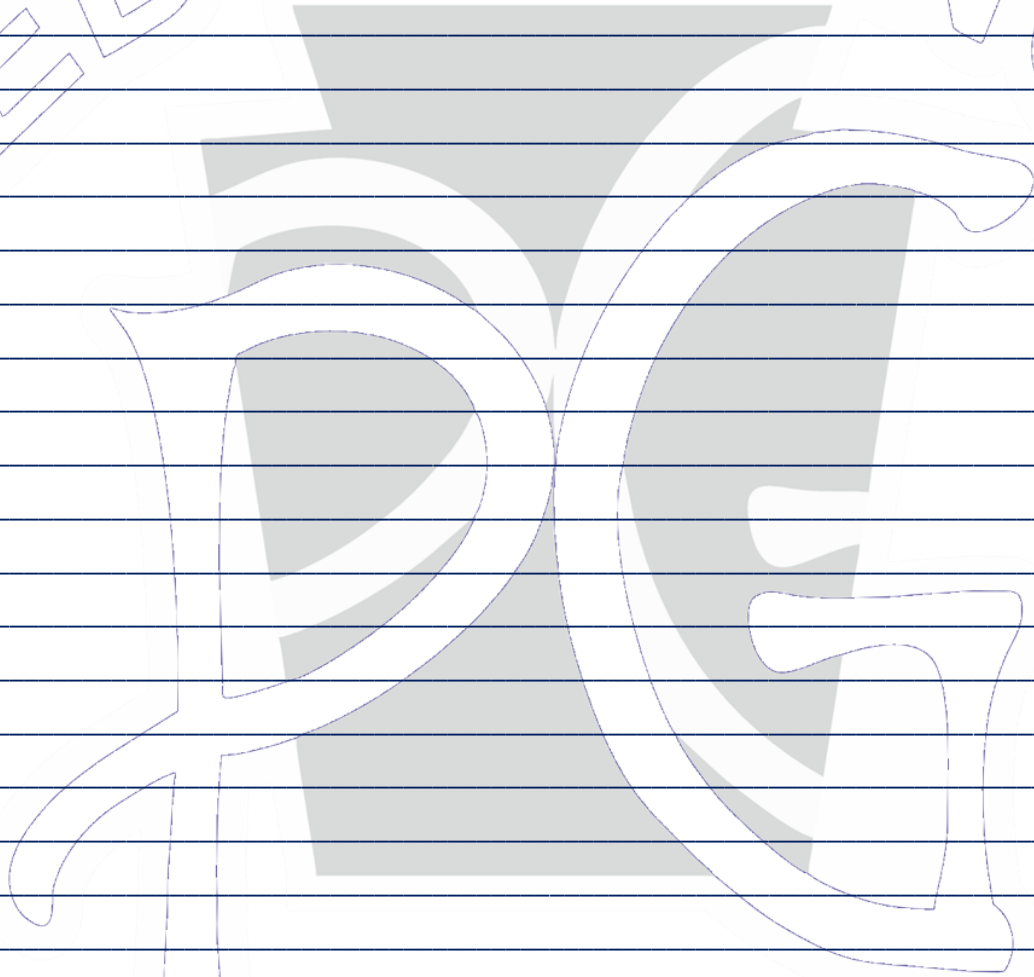
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Subject – Physics

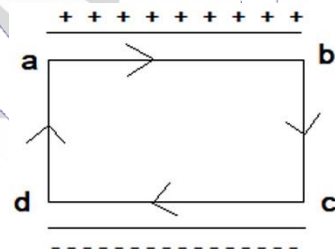
Section-A

Answer the following question.

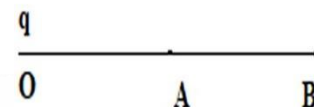
1. What does $q_1 + q_2 = 0$ signify in electrostatics?
2. A force F is acting between two charges placed some distance apart in vacuum. If a brass rod is placed between these two charges. How does the force change?
3. Two point charge $+q$ and $-q$ are placed a “ d ” distance apart. Draw the line on which the resultant field is parallel to the line joining the two charges?
4. Define volume charge density at a point. Write its SI unit.
5. The electric potential is constant in a given region. what can you say about the electric field there?
6. Is the capacitance C of a capacitor proportional to the charge Q ?
7. A thin metal sheet is placed in the middle of a parallel plate capacitor what will be the effect on the capacitance?

Section-B

8. The electric field inside a parallel plate capacitor is E . Find the amount of work done in moving charge q over a closed rectangular loop a b c d a.



9. How would you connect two capacitors across a battery, in series or parallel, so that they store greater (i) total charge and (ii) total energy?
10. A point charge q is placed at O, as shown in figure
Is $V_A - V_B$ positive, negative or zero, if q is a
(i) positive (ii) negative charge?



11. Is there any kind of material which when placed between the plates of a capacitor reduces its capacitance?

12. An electric dipole is placed in a uniform electric field E , write the expression for the torque T experienced by the dipole. Show diagrammatically the orientation of the dipole in the field for which the torque is

(i) Maximum (ii) half the maximum value (iii) Zero.

13. What is an electric line of force? What is its importance?

14. Two point charge $+q$ and $-q$ are placed a "d" distant apart. Draw the line on which the resultant field is parallel the line joining the two charges.

15. Two charge of magnitude $-2Q$ and $+Q$ are located at points $(a,0)$ and $(4a,0)$ respectively. What is the electric flux due to these charges through a sphere of radius $3a$ with its center at the origin?

Section-C

16. Define electric flux. Write its SI unit. A spherical balloon carries a charge that is uniformly distributed over its surface. As the balloon is blow up and increases in size, how does the total electric flux coming out of the surface change? Give reason.

17. Five point charges, each of value $+q$ coulomb are placed on five vertices of a regular hexagon of side L meters. Find the magnitude of force on a charge $-q$ Coulomb placed at the centre of the hexagon.

18. An infinite number of charges, each equal to q are placed along x -axis at $x=1, x=2, x=4, x=8$ ----and so on

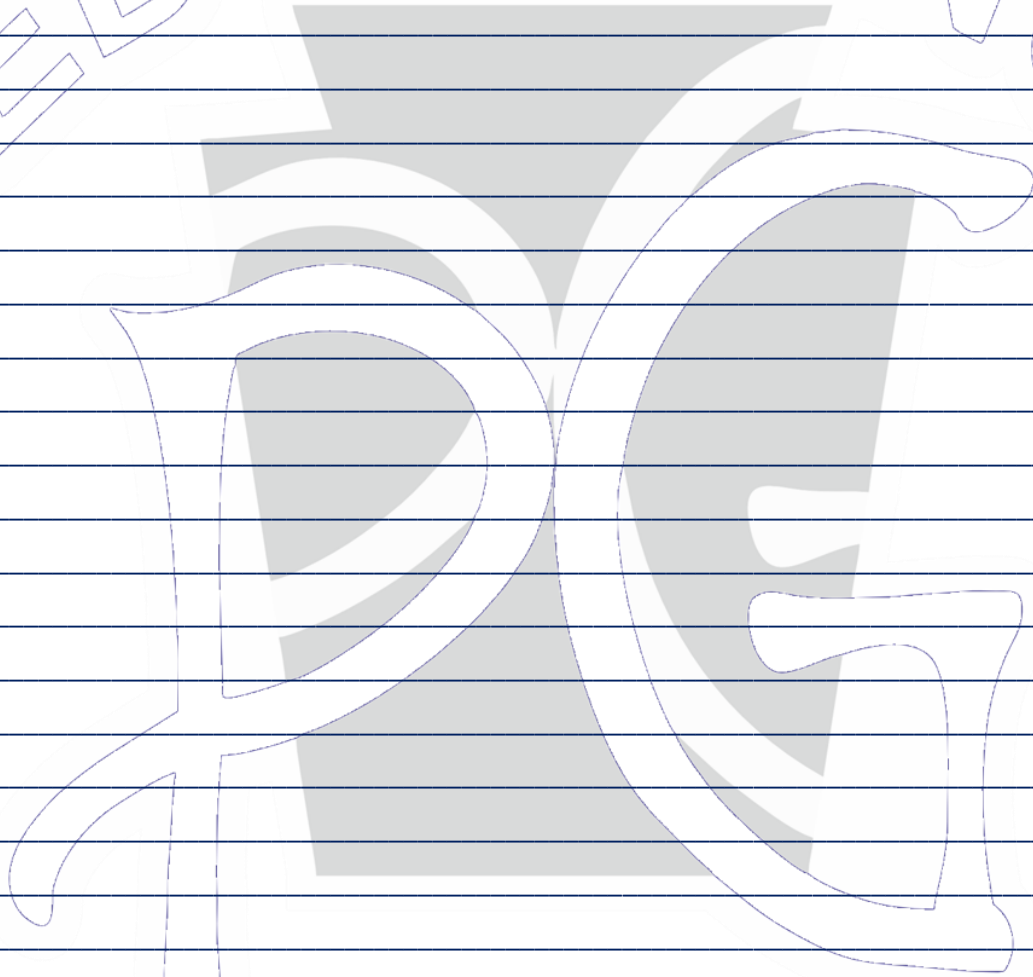
(i) Find the electric field at the point $x=0$ due to this set up of charges.

(ii) What will be the electric field, if in the above set up, the consecutive charges have opposite signs.

19. Calculate the electric flux through each of the six faces of a closed cube of length L if a charge q is placed (a) at its centre (b) at one of its vertices.

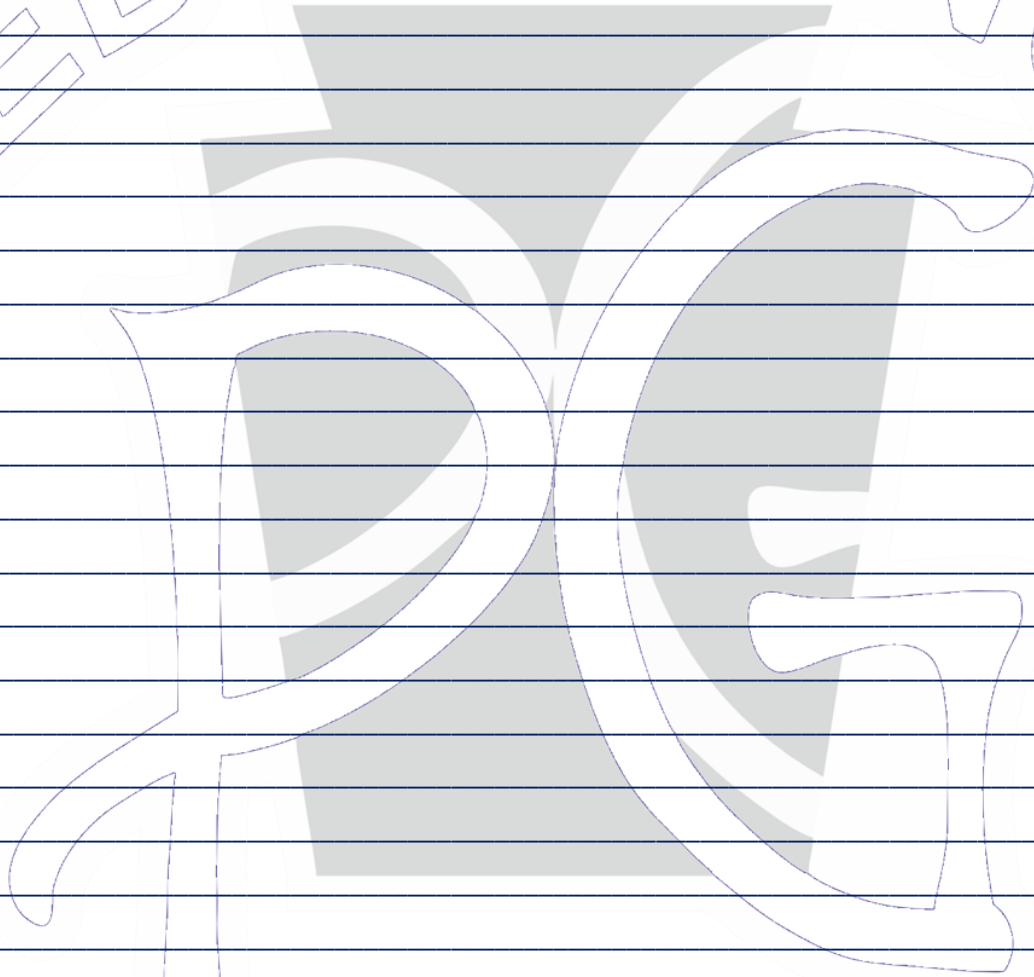
20. A thin metal sheet is placed in the middle of a parallel plate capacitor. What will be the effect on the capacitance?

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Subject – Chemistry**Very Short Answer Type Questions**

1. Define the term Solution?
2. State the condition resulting in reverse osmosis.
3. When is the value of Van't Hoff factor more than one?
4. What is the sum or the mole fraction of all the components in a three components system?
5. Define mole fraction of a component in a solution. How is the molarity of a solution different from its molarity?
6. State the formula relating pressure of a gas with its mole fraction in a liquid solution in contact with it.
7. What would be the value of Von't Hoff factor for a dilute solution of K_2SO_4 in water?
8. Why is the elevation in boiling point of water different in the following solutions?
(i) 0.1 Molar solution
(ii) 0.1 Molar sugar solution.
9. 10 ml of liquid A was mixed with 10 ml of liquid B. The volume of the resulting solution was found to be 19.9 ml. What do you conclude?
10. Define an "ideal solution".
11. State Raoult's law for solutions of non-volatile solutes.
12. Calculate the mass percentage of benzene and carbon tetrachloride if 22g of benzene is dissolved in 122g of carbon tetrachloride.

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°C.
4. An aqueous solution of glucose is made by dissolving 10 g of glucose ($C_6H_{12}O_6$) 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 4.27×10^5 mm 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 BaCl₂ are prepared separately in water. The freezing points of KCl is found to be -2°C. What freezing point would you expect for BaCl₂ solution assuming both KCl and BaCl₂ 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 kg litre⁻¹. (Molar mass of methanol of 32.0 g mol⁻¹).
10. At a certain temperature, the vapour pressure of CH₃OH and C₂H₅OH solution is represented by

$$P = 119x + 135.$$
 where x is the mole fraction of CH₃OH. 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° C. Calculate.
 - (i) The molar mass of acetic acid from this data
 - (ii) Van't Hoff factor [For benzene, K_f = 5.12 K kg 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 g 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? (R = 0.0821 atm L mol⁻¹ K⁻¹)
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 K mol⁻¹ 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 atm at 27°C. Calculate the Van't Hoff factor. (R = 0.082 L atm-mol⁻¹ K⁻¹)
 What conclusion do you draw about the molecular state of the solute in the solution?
5. Determine the amount of CaCl₂ (i = 2.47) dissolved in 2.5 litre of water such that its osmotic pressure is 0.75 atm at 27°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, KCl, CH₃OH, CH₃CN

- 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.
- 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 K_b for Benzene = 2.53 K kg mol⁻¹]
- Nalorphine (C₁₉H₂₂NO₃), 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 × 10⁻³ m aqueous solution required for the above dose.

Long Answer Type Questions

- Define the terms 'molarity' and 'molality' for a solution. How does a rise in room temperature change the molarity and molality values of the solution? How much urea (molar mass = 60 g mol⁻¹) should be dissolved in 50 g of water so that its vapour pressure at room temperature is reduced by 25%. Calculate molality of the solution obtained.
- 100 g of liquid A (molar mass 140 g/mol) was dissolved in 1000 g of liquid B (molar mass 180 g/mol). The vapour pressure of pure liquid B was found to be 500 torr. Calculate the vapour pressure of pure liquid A and its vapour pressure in the solution if the total vapour pressure of the solution is 475 torr.
- Explain with a suitable diagram and appropriate example, why some non-ideal solution shows negative deviations.

ALKYL AND ARYL HALIDES

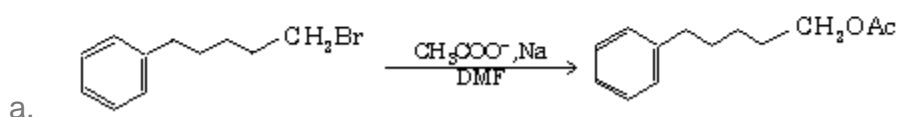
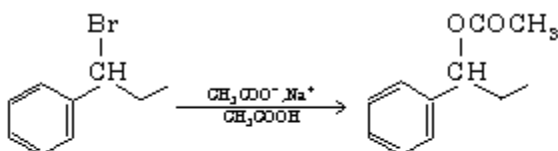
Very short answer type questions

- Which of the following is most reactive towards S_N2 reaction : CH₃Br, (CH₃)₂CHBr, (CH₃)₃CBr.
- Organic halogen compounds used in industry as solvents are chlorides rather than bromides and iodides.
- How can you test the purity of chloroform?
- The use of chloroform as anaesthetic is decreasing. Why?
- What is the structure of an alkyl halide with molecular formula C₄H₉Br is optically active.
- What is chirality?
- Which will have a higher boiling point :
 - 1-chloroethane or 2-methyl-2-chlorobutane? Give reasons.
- An acid having molecular formula C₃H₅O₂Br is optically active. What is its structure.
- Which effect will the resonance have on the dipole moment of vinyl chloride?
 - CH₂ = CH – Cl⁻ ↔ CH₂ – CH = Cl⁺
- Ethyl chloride is a gas, whereas ethyl iodide is a liquid at room temperature. Explain.
- What is meant by resolution?

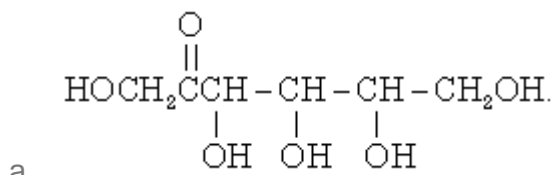
12. Write the IUPAC name of : $\text{CH}_3\text{CH}_2\text{CHCl}_2$
13. Derive the structure of : 2-chloro-2, 3-dimethyl pentane.

Short answer type questions

1. Chloroform contains chlorine but gives no reaction with AgNO_3 solution. Why?
2. Why is chloroform stored in dark coloured bottles?
3. Iodoform gives a precipitate with silver nitrate on heating while chloroform does not.
4. Predict whether the following substitutions are likely to be $\text{S}_{\text{N}}1$ or $\text{S}_{\text{N}}2$



5. A hydrocarbon C_5H_{12} gives only the chlorination product. Identify the compound.
6. Arrange the following halides in order of increasing $\text{S}_{\text{N}}2$ reactivity :
 - a. $\text{CH}_3\text{CH}_2\text{Cl}$, CH_3Br , $(\text{CH}_3)_2\text{CHCl}$, CH_3Cl .
7. Allyl chloride is more reactive than n-propyl chloride towards nucleophilic substitution reaction. Explain. Why?
8. Which out of the two : 2-cyclopentanol or 3-cyclopentenol has chiral centre.
9. 2-Hexulose has the formula

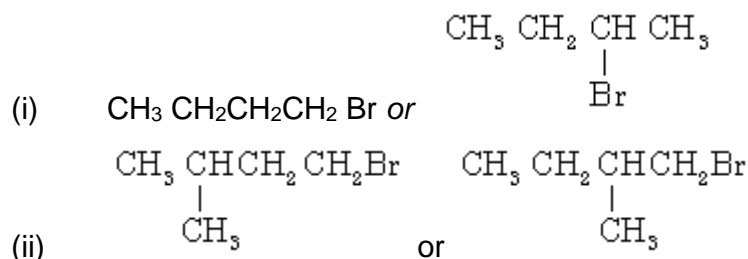


- b. How many chiral carbon atoms does it have?
10. What are enantiomers? Draw the structure of the possible enantiomers of 3-methylpent-1-ene.
 11. Why is sulphuric acid not used during the reaction of alcohols with KI?
 12. Write the structural isomers of the compound having formula $\text{C}_4\text{H}_9\text{Br}$.
 13. Covert
 - a. (i) Propene to prop-1-ol
 - (ii) 1-Bromopropane to 2 Bromo propane
 14. Out of HCl (g) and SOCl_2 , which is preferred for converting ethanol into chloroethane?

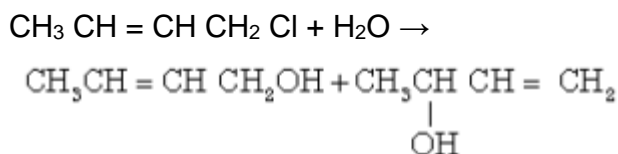
Long answer type questions

1. Write the various isomers of $\text{C}_7\text{H}_7\text{Cl}$ containing benzene ring. Which of these has weakest C – Cl bond?

2. An alkyl halide (A) on reaction with magnesium in dry ether followed by treatment with ethanol gave 2-methylbutane. Write all the structure of [A].
3. Among the isomeric alkanes of molecular formula C_5H_{12} Identify the one that on photochemical chlorination yields:
- A single monochloride.
 - Three isomeric monochlorides, [Consider only structural isomers]
 - Four isomeric monochlorides. [Consider only structural isomers]
4. Which alkyl halides from the following pairs would you expect to react more rapidly by S_N2 mechanism? Explain your answer,

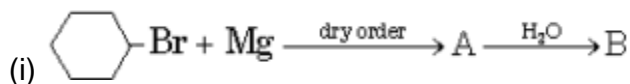


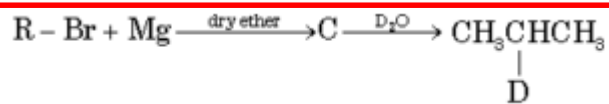
5. A hydrocarbon, does not react with chlorine in dark but gives a single monochloro compound C_5H_9Cl in sunlight. Identify the hydrocarbon.
6. p-Dichlorobenzene has higher m.p. and solubility than those of o- and m-isomers. Discuss.
7. Explain the following reaction :
- $n\text{-BuBr} + KCN \xrightarrow{EtOH-H_2O} n\text{-BuCN}$
8. Write the structure of the major organic product in each of the following reactions:
- $CH_3CH_2CH_2Cl + NaI$
 - $CH_3CH=C(CH_3)_2 + HBr \rightarrow$
 - $C_6H_5ONa + C_2H_5Cl \rightarrow$
9. Explain the formation of two products in the following reaction:



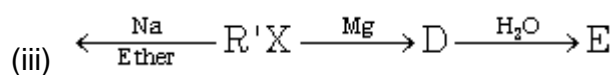
Very long, answer type question

- Q.1. Out of $C_6H_5CH_2Cl$ and $C_6H_5CHClC_6H_5$, which is more easily hydrolysed by aqueous KOH?
- Q.2. Explain why
- the dipole moment of chlorobenzene is lower than that of cyclohexyl chloride,
 - alkyl halides, though polar, are immiscible with water,
 - Grignard reagents should be prepared under anhydrous conditions.
- Q.3. Identify A, B, C, D, E, R and K in the following :

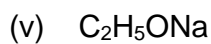
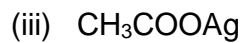
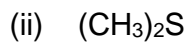
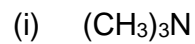




(ii)



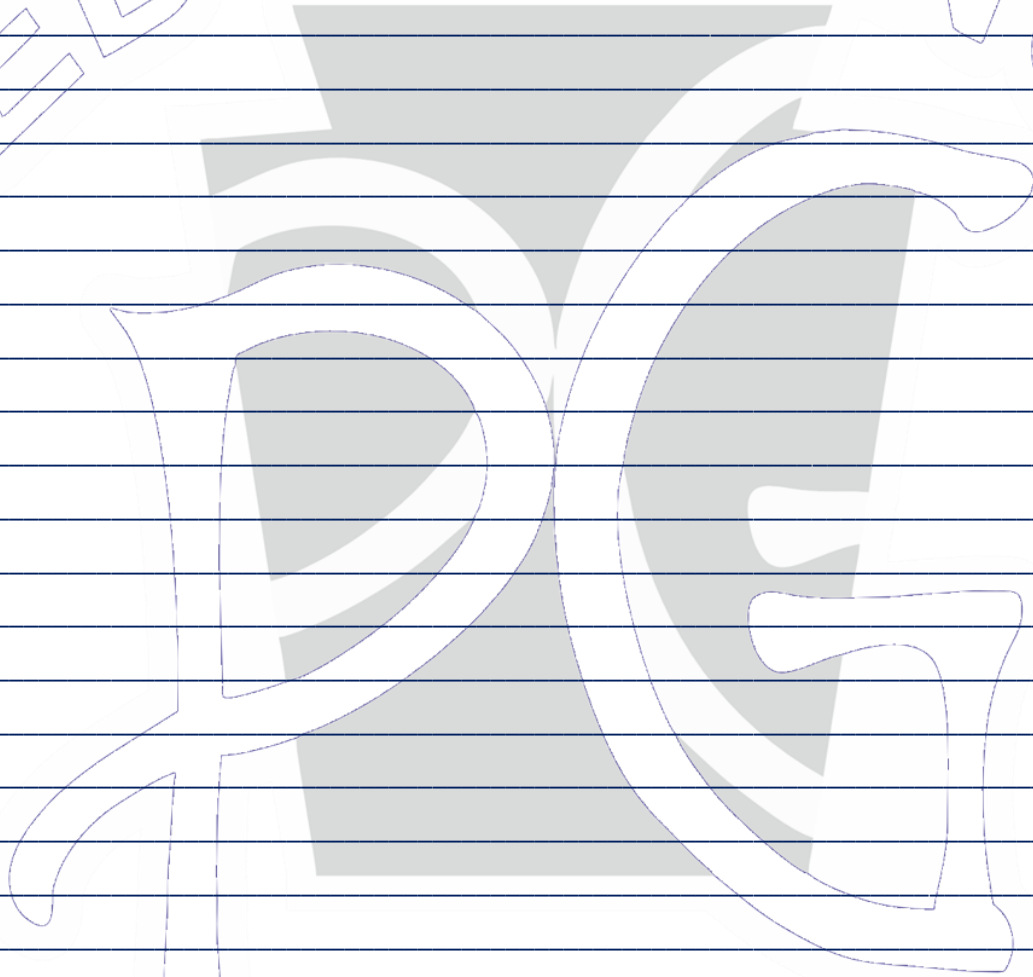
Q.4. Give the structure of the main organic substitution product expected from the reaction of 1° bromobutane with



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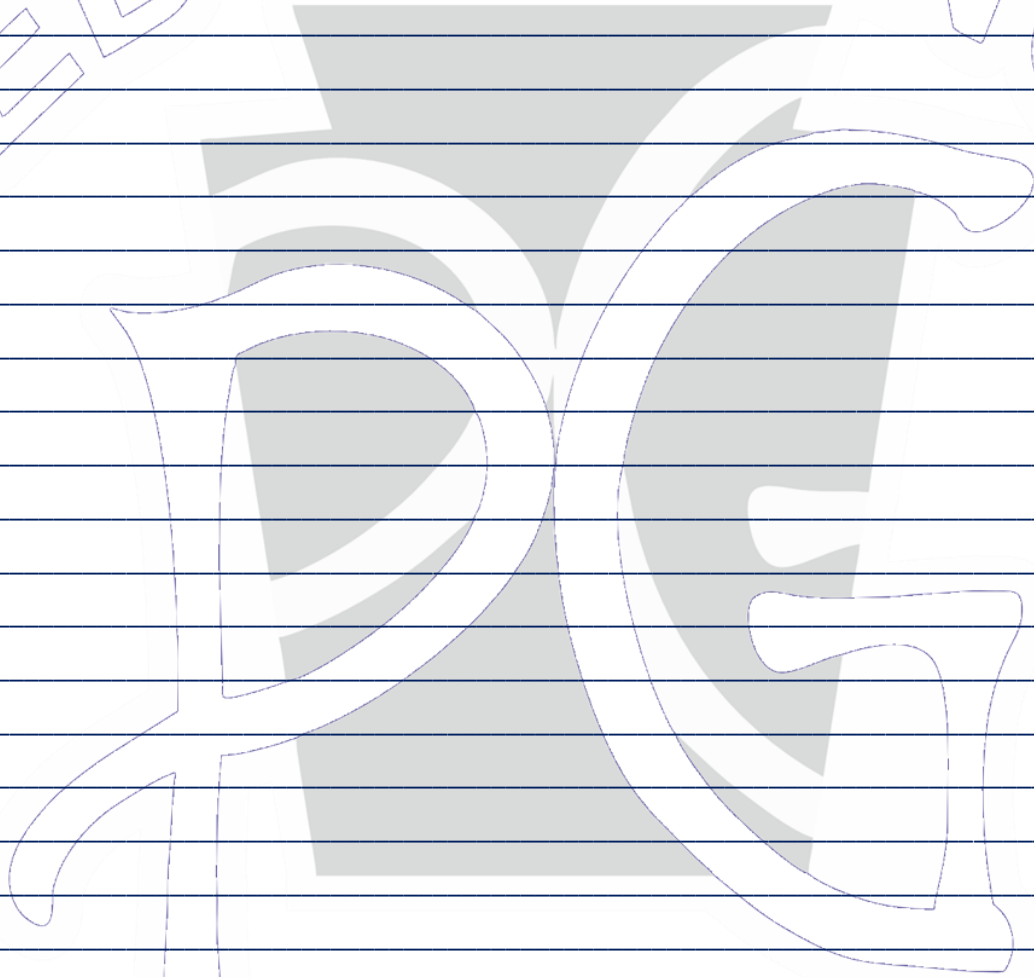
Blank lined area for writing the answer to Q.4.

EDUCATING



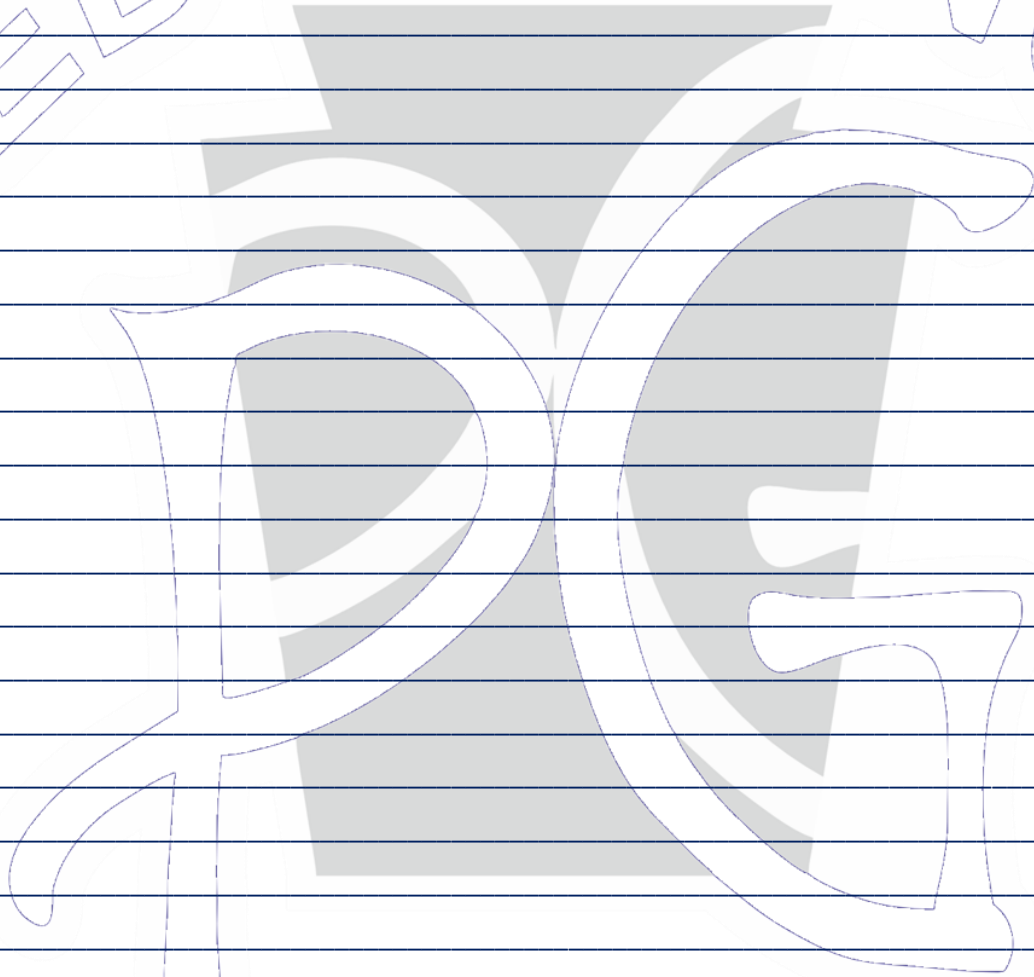
HEART AND MIND

EDUCATING



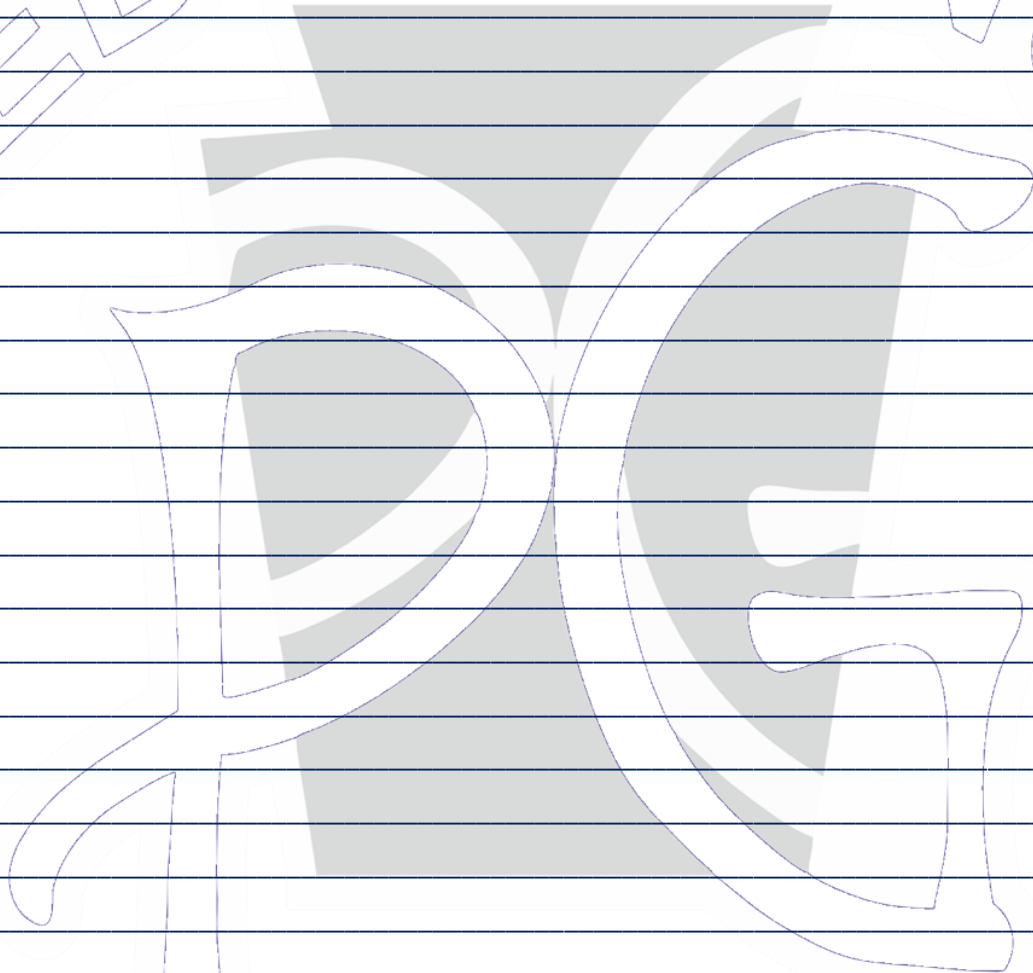
HEART AND MIND

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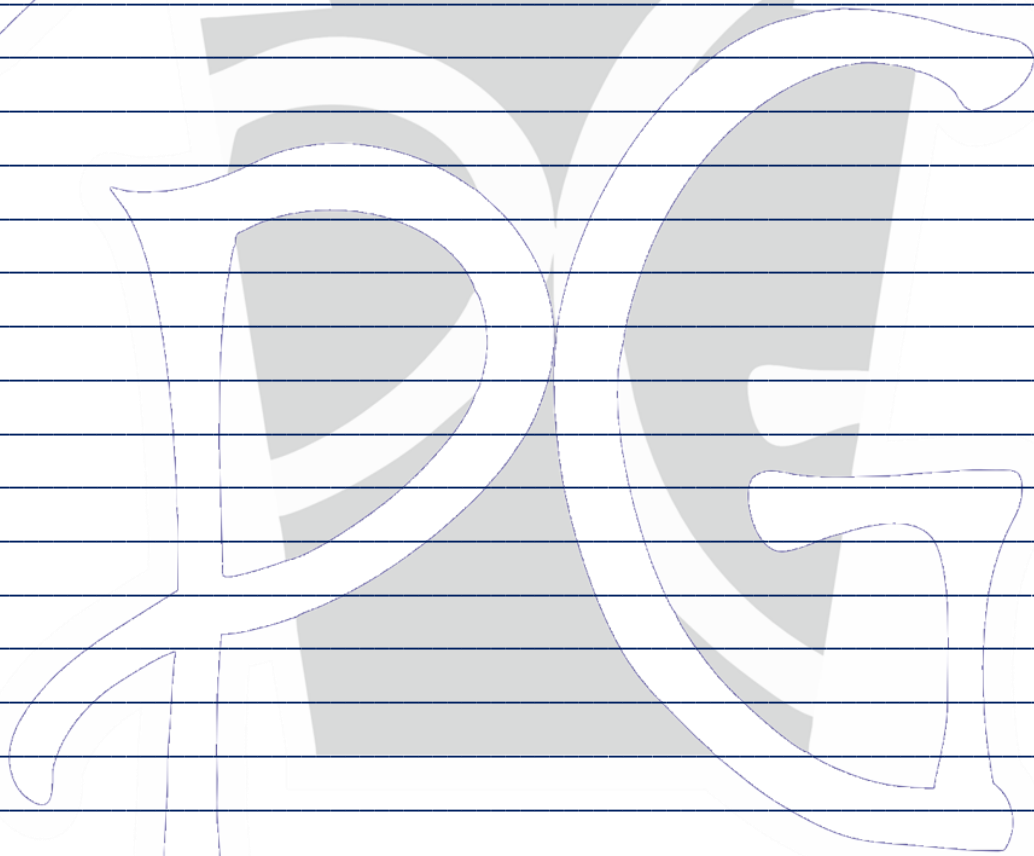
HEART AND MIND

EDUCATING



HEART AND MIND

EDUCATING



HEART AND MIND

Subject – Physical Education

1. Write down the role of the various committees before a tournament.
2. Write down the role of the various committees during a tournament.
3. Describe the merits & demerits of knock out Tournaments.
4. Describe the merits & Demerits of league Tournament.
5. Define tournament and explain its types?
6. Draw the fixture based on knock out for 21 team.
7. Draw the fixture for 11 team based on League Tournament use cyclic method.
8. What is Tournament? Explain any four objectives of Tournament.
9. What do you understand league Tournament. Explain the working of technical committee & organising Committee?
10. Explain the procedure (method) to fix byes and seeding.
11. Explain the symptoms & corrective measures of kyphosis.
12. Mention the symptoms causes & corrective measures of knock-knee.
13. Discuss the symptoms, causes & corrective measures of flat feet.
14. Describe the symptoms, causes & corrective measuring of scoliosis.
15. Discuss the symptoms, causes & corrective measure of bowlegs.
16. What do you mean by hump back or Hunch back? Explain the causes of it.
17. Explain the symptoms & precautions of round shoulders
18. Elucidate spine postural deformities.
19. Express your view on lower limbs deformities.
20. Suggest physical activities as corrective measures for postural deformities.

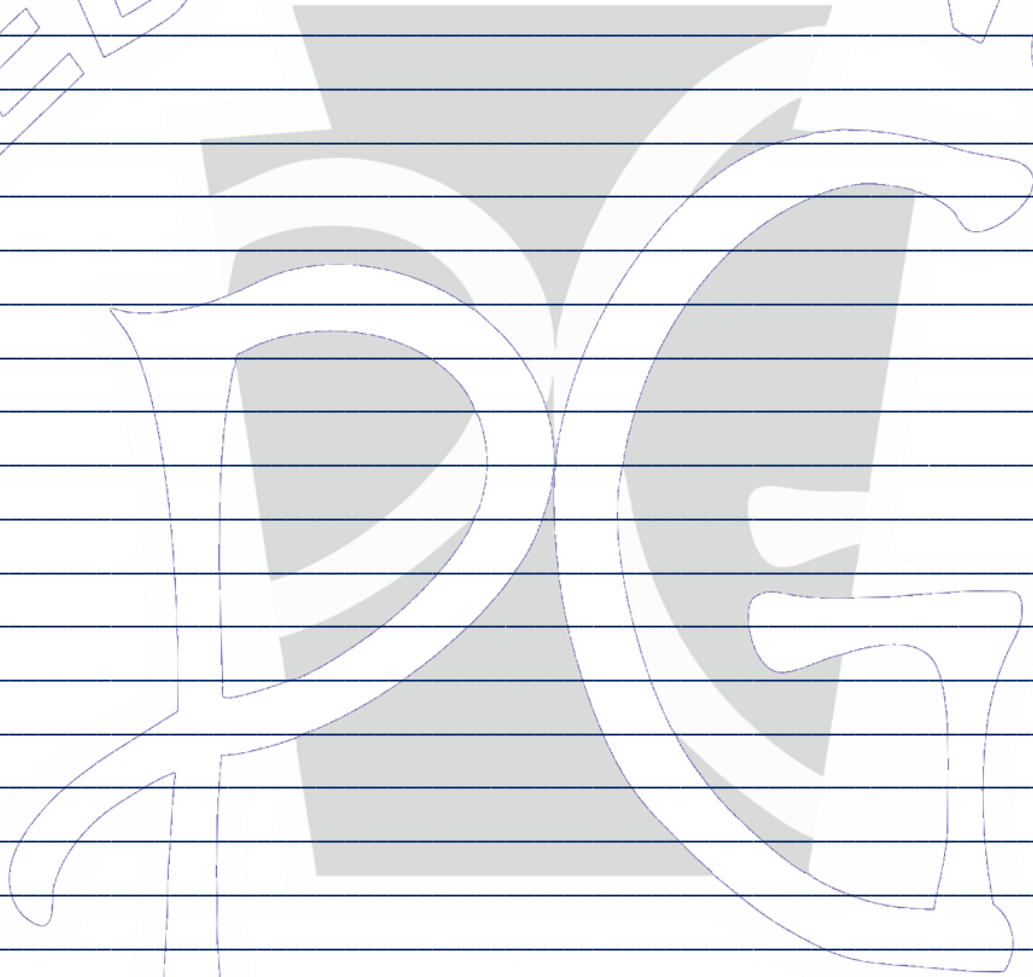
विषय – हिन्दी

- प्रश्न 1— 'आत्मपरिचय' कविता में कवि हरिवंश राय बच्चन ने अपने व्यक्तित्व के किन पक्षों को उभारा है?
- प्रश्न 2— चिड़िया के पंखों में चंचलता आने के क्या-क्या कारण हो सकते हैं?
- प्रश्न 3— भक्तिन के चरित्र की विशेषताओं पर प्रकाश डालिए।
- प्रश्न 4— भगवत जी बाजार को सार्थक व समाज को शान्त कैसे कर रहे हैं? 'बाजार दर्शन' पाठ के आधार पर बताइए।
- प्रश्न 5— 'सिल्वर वैडिंग' कहानी के माध्यम से लेखक ने क्या संदेश देने का प्रयास किया है?

Subject – Computer Science

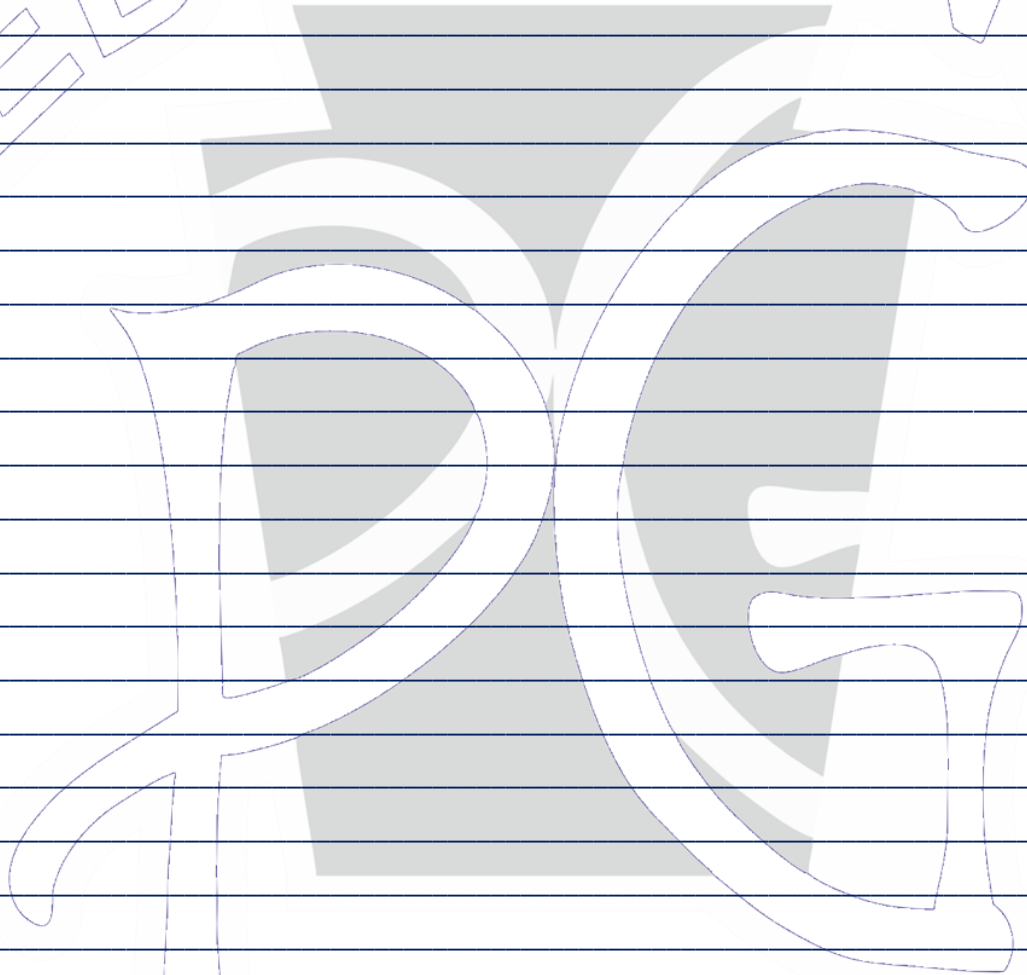
1. Project Work (Do any one of the following)
 - a. Hospital Management System
 - b. Hostel Management System

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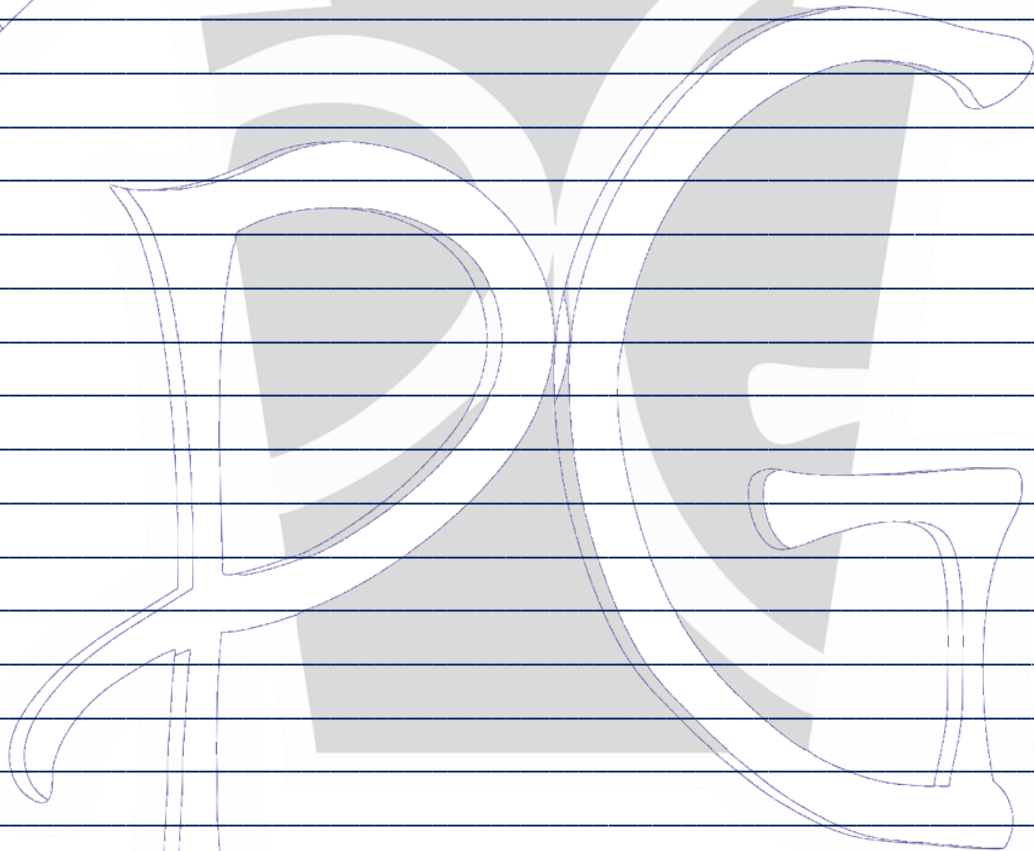
HEART AND MIND

Smart Activity

- ❖ Plant a tree. Click a photograph with it and share the same in your class group. 1 to 12
- ❖ Write the names of all the teaching staff of your school (P. G. Senior Secondary School)
- ❖ Write the process of making a perfect cup of tea.
- ❖ Write a paragraph on your daily routine and submit it in your class group every day between 8pm to 10 pm.

Write From Here

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HEART AND MIND



P. G. SENIOR SECONDARY SCHOOL

Affiliation No.: 2131500

Affiliated to CBSE, (10+2) New Delhi, Bharat

School Code: 70839



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I am Nidhi Singh, I got admission in PG Senior Secondary School in class 6th and studied there till class 12th. It has been an amazing experience of my life where the school not only focuses on academics but also on overall development of a student. The teachers there are very helpful and supportive. Moreover, I would like to thank every teacher of this family who helped me to develop my overall personality by correcting my mistakes.

Nidhi Singh

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