



# SUMMER VACATION

Holiday Homework

Grade - XII Science





**"The holiday season is a perfect time to reflect on blessings and take out ways to make life better for those around us"**

Summer vacations is the most awaited time for parents and kids alike. During this academic session 2021-22, our students are well connected with teachers virtually. We, team members of Lotus Valley, understand it very well that presently our proximity to resources is limited. Considering this, we tried to keep "Summer Holidays Homework" simple, informative but interesting as well so that our students love to spend their time in completing it under guidance of their teachers.

The summer vacation begins from 17<sup>th</sup> May, 2021 and school will reopen on 3<sup>rd</sup> June, 2021. Parents can download holidays homework from school's website i.e [www.lotusvalley.edu.in](http://www.lotusvalley.edu.in) or Ecare- App.

It is the time of the year again when we can do things which we are unable to do during the regular routine days. Here are few suggestions for parents:-

- Make sure that you are spending quality time with your wards amidst this tensed environment. It is very important to keep their anxiety at minimum.
- Giving them small responsibilities in household chores will aid them to be independent.
- Teach them the importance of moral values in their life.
- Keeping in view the prevailing situation, indulge yourself in various indoor games with them.

Also students can :-

- Read book, May it be fairy books, encyclopedia or comic books. Explore the imaginative world and go on a fantasy tour.
- Run, exercise, sweat! Channelize your energy and enjoy playing indoor games.
- Enhance communication skills by conversing with your friends and family in English.
- Explore the culture and heritage of the world by visiting heritage sites virtually. Download the app "Google Earth" and enjoy virtual tours around the Earth.

**Wish you all a fun filled, safe and healthy holidays ahead!**



# ASSIGNMENTS

## Instructions for completing assignments-

- All the assignments are to be done in subject notebooks with proper date and headings.
- After completing the assignments of each subject, students are required to make pdf of assignments with their name, class and rollno. and have to submit the same to their respective subject teachers.
- The written part should be neatly presented in student's handwriting. Take the help of your parents if necessarily required.
- Remember a well presented 'Holiday Homework' fetches your marks and appreciation of your teachers and classmates.
- Revise all the work done in class till date.

## ENGLISH

### **Assignment - I**

**1. Standing a few yards away,**

**I looked again at her, wan, pale  
as a late winter's moon and felt that old  
Familiar ache, my childhood's fear**

- (a) Who is 'I' in the above extract? Whom does she look at? Why?
- (b) Identify the poetic device in the third line.
- (c) What childhood fear did the poet have?
- (d) Why does the poet call her ache "familiar"?

**2. and felt that Old**

**familiar ache, my childhood's fear,  
but all I said was, see you soon, Amma,  
all I did was smile and smile and smile. . . .**

- (a) What was the poet's fear? Why does she call it a childhood fear?
- (b) "but all I said". What do these words tell you about the poet's state of mind?
- (c) Explain the irony in the expression "see you soon".
- (d) What kind of smile did the poet put on?

**3. "My friends," said he, "I-I-" But something choked him. He could not go on.**

Then he turned to the blackboard, took a piece of chalk, and, bearing on with all his might, he write as large as he could –

- i. Where does this conversation take place?
- ii. Who does 'I' and 'My friends' respectively refer to?
- iii. Why does the speaker feel choked?
- iv. What did the speaker write on the blackboard?

**4. And yet, for these**

Children, these windows, not this map, their work,  
Where all their future's painted with a fog,  
A narrow street sealed in with a lead sky  
Far far from rivers, capes, and stars of words.

- (a) What do the 'Windows' signify here?
- (b) Why is their future painted with a fog?
- (c) What images does the poet use to highlight the polluted atmosphere in the cities?
- (d) What do the slum children crave for?
- (e) Do you think they can ever get rid of this situation? How?

**5. Surely, Shakespeare is wicked, the map a bad example,**

With ships and sun and love tempting them to steal-  
For lives that slyly turn in their cramped holes  
From fog to endless night?

- (a) What kind of education is being provided in slum schools?

- (b) What does the hope for a better life compel the children to do?
  - (c) Where do these children spend their life?
  - (d) How does the poet suggest that they lead a tireless life?
6. Give examples to show that slum children lead an unhygienic life.
  7. What are the slum children deprived of? What are their inquisitive eyes searching for?
  8. Why are the slum children 'stunted' and 'diseased'?
  9. Why is the poet critical of the modern cities?
  10. What is the world confined to for the slum children?
  11. How do these children view the world around them?
  12. How has the poet voiced his criticism of the post-Second World War scenario?
  13. Where is the poet going and why? Why is the mother accompanying her?
  14. What is dilemma in the poet's mind?
  15. What do you think the poet's mother's thoughts were before she dozed off in the car?
  16. What is the contrast between the scene inside the car and outside it?
  17. What different images and symbols does the poet use to convey the idea of her mother's old age and imminent death?
  18. How does the poem bring out the irony of human relationships?
  19. Do you think the poet's mother expected her daughter to stay back with her to look after her? Give reason in support of your answer.
  20. describe the background in which "The Last Lesson" has been set.
  21. Why did the narrator want to run away and spend the day outdoors? Did he overcome his temptation?
  22. Why was there a crowd in front of the bulletin-board at the town hall? Why did people usually come there?
  23. Was blacksmith Wachter really making fun of the narrator when he saw him hurrying towards school?
  24. What had the narrator counted upon on reaching school? What did he find on the contrary?
  25. Did the teacher's words, "We were beginning without you" have deeper connotations? Explain.

### **Assignment - II**

**Answer the following questions in about 30-40 words each:**

- Q1. What would, according to Charley, the presidents of the New York Central swear? Why does he contradict them?
- Q2. "But that's the reason he said, and my friends all agreed." What problem is referred to in the above line? What reason of the problem is being cited here?
- Q3. Why does Charley say it is easy to get lost at the Grand Central Station?
- Q4. How did Charley land up at the third level of the Grand Central Station?
- Q5. What was peculiar about the third level of the Grand Central Station?
- Q6. Why did Charley want to go to Galesburg?
- Q7. How did Charley ensure that the third level at the Grand Central Station belonged to the past?
- Q8. What did Charley do to be able to buy tickets to Galesburg? Why couldn't he still buy tickets?
- Q9. Why did Charley and his wife begin searching for the third level?
- Q10. Did Louisa love Charley? Give instances to support your answer.
- Q11. What role does Sam's letter play in the story "The Third Level"?
- Q12. What was Sam's occupation? What business did he wish to have?
- Q13. What did Charley find in his oldest first-day covers one day?

**Answer the following questions in about 150 words each:**

- Q14. How does Jack Finney create the atmosphere of late nineteenth century in the story "The Third Level"?
- Q15. Briefly describe two unbelievable incidents in the story "The Third Level" and explain why you think they are unbelievable?
- Q16. What is the metaphorical meaning of the 'third level'? Did Sam actually find it? Give reasons for your answer.

## MATHEMATICS

### Assignment - I

1. Show that the relation  $R$  in the set  $N$  of Natural numbers given by  $R = \{(a, b) : |a - b| \text{ is a multiple of } 3\}$  is an equivalence relation. Determine whether each of the following relations are reflexive, symmetric, and Transitive.
2. Check whether the relation  $R$  in  $R$  defined by  $R = \{(a, b) : a \leq b^3\}$  is reflexive, symmetric, transitive.
3. Prove the relation  $R$  on the set  $N \times N$  defined by  $(a, b) R (c, d) \Leftrightarrow a+d = b + c$ , for all  $(a, b) (c, d) \in N \times N$  is an equivalence relation.
4. Prove that the function  $f: \mathbf{R} \rightarrow \mathbf{R}$ , given by  $f(x) = |x| + 5$ , is not bijective.
5. Prove that the function  $f: \mathbf{R} \rightarrow \mathbf{R}$ , given by  $f(x) = 4x^3 - 7$ , is bijective

Q6. Find the value of  $x$  such that :-

$$\begin{bmatrix} 1 & 0 & 2 \\ 1 & 2 & 1 \\ x & 1 & 0 \end{bmatrix} \begin{bmatrix} 1 \\ 1 \\ 1 \end{bmatrix} = \begin{bmatrix} 0 \\ 0 \\ 0 \end{bmatrix}$$

Q7. If  $A = \begin{bmatrix} 3 & -4 \\ 1 & -1 \end{bmatrix}$  prove that  $A^n = \begin{bmatrix} 1+2n & -4n \\ n & 1-2n \end{bmatrix}$  where  $n$  is any positive integer.

Q8. If  $A = \begin{bmatrix} 1 & 2 & 0 \\ 3 & -4 & 5 \\ 0 & -1 & 3 \end{bmatrix}$ , find  $A^2 - 4A + 3I_3$

Q9. Express the matrix  $A = \begin{bmatrix} 4 & 2 & -1 \\ 3 & 5 & 7 \\ 1 & -2 & 1 \end{bmatrix}$  as the sum of a symmetric and a skew symmetric matrix

Q10. Express the following matrices as the sum of symmetric and skew-symmetric matrices:-

$$\begin{array}{ll} \text{(i)} & A = \begin{bmatrix} 6 & 1 \\ 3 & 4 \end{bmatrix} & \text{(ii)} & A = \begin{bmatrix} 3 & 2 & 3 \\ 4 & 5 & 3 \\ 2 & 4 & 5 \end{bmatrix} \\ \text{(iii)} & A = \begin{bmatrix} 2 & 3 & -1 \\ -1 & 4 & 2 \\ 6 & 0 & 8 \end{bmatrix} & \text{(iv)} & \begin{bmatrix} 6 & 1 & -5 \\ -2 & -5 & 4 \\ -3 & 3 & -1 \end{bmatrix} \end{array}$$

11. If  $A$  &  $B$  are square matrices of order 3 such that  $|A| = -1$  &  $|B| = 3$ , then find the value of  $|3AB|$ .

12. Without expanding evaluate the determinant

$$\begin{vmatrix} (a^x + a^{-x})^2 & (a^x - a^{-x})^2 & 1 \\ (a^y + a^{-y})^2 & (a^y - a^{-y})^2 & 1 \\ (a^z + a^{-z})^2 & (a^z - a^{-z})^2 & 1 \end{vmatrix}, \text{ where } a > 0$$

13. Using the properties of determinants, prove the following:

$$\begin{vmatrix} 1 & 1+p & 1+p+q \\ 2 & 3+2p & 1+3p+2q \\ 3 & 6+3p & 1+6p+3q \end{vmatrix} = 1$$

14. Prove:  $\begin{vmatrix} 1 & a & a^2 - bc \\ 1 & b & b^2 - ac \\ 1 & c & c^2 - ab \end{vmatrix} = 0$

23. Find  $A^{-1}$  where  $\begin{bmatrix} 6 & 4 & 2 \\ -12 & 15 & 18 \\ 25 & -20 & 15 \end{bmatrix}$  and solve the following

$$6x - 12y + 25z = 4$$

$$4x + 15y - 20z = 3$$

$$2x + 18y + 15z = 10$$

24. Find  $A^{-1}$  where  $\begin{bmatrix} 3 & 2 & 1 \\ 4 & -1 & 2 \\ 7 & 3 & -3 \end{bmatrix}$  and solve the following

$$3x + 4y + 7z = 14$$

$$2x - y + 3z = 4$$

$$x + 2y - 3z = 0$$

## Assignment - II

1. Examine the continuity of the function  $f(x) = \begin{cases} 1+x; & x \leq 2 \\ 5-x; & x > 2 \end{cases}$  at  $x=2$ .
2. Show that the function  $f(x) = \{2x - |x|\}$  is continuous at  $x=0$ .
3. Discuss the continuity of the function:  $f(x) = \begin{cases} \frac{e^x - 1}{\log(1 + 2x)}, & x \neq 0 \\ 7, & x = 0 \end{cases}$  at the point  $x=0$ .
4. Examine the continuity of the functions at  $x=0$   
(i)  $f(x) = \begin{cases} \frac{x}{\sin 3x}, & x \neq 0 \\ 3, & x = 0 \end{cases}$  (ii)  $f(x) = \begin{cases} \frac{\sin 2x}{\sin 3x}, & x \neq 0 \\ 2, & x = 0 \end{cases}$
5. Determine the constants if the given functions are continuous at specified points  
(i)  $f(x) = \begin{cases} ax + 5; & x \leq 2 \\ x - 1, & x > 2 \end{cases}$  at  $x=2$  (ii)  $f(x) = \begin{cases} \frac{x^2 - 3x + 2}{x - 1}, & x \neq 1 \\ k, & x = 1 \end{cases}$  at  $x=1$
6. Find the value of a, b and c for which the function is continuous at  $x=0$ .  
$$f(x) = \begin{cases} \frac{\sin(a+1)x + \sin x}{x}, & x < 0 \\ c, & x = 0 \\ \frac{(x + bx^2)^{1/2} - x^{1/2}}{bx^{3/2}}, & x > 0 \end{cases}$$
7. Find the point of discontinuity for the function  $f(x) = \begin{cases} \frac{x^4 - 16}{x - 2} & x \neq 2 \end{cases}$
8. Show that  $f(x) = \begin{cases} 5x - 4 & a < x < 1 \\ 4x^3 - 3x & 1 < x < 2 \end{cases}$  is continuous at  $x = 1$
9. For what value of K in the for continuous  $x = 0$ ,  $f(x) = \frac{1 - \cos 4x}{8x^2}$   $x \neq 0$
10. If  $f(x) = \begin{cases} 3ax + b & \text{if } x > 1 \\ 11 & \text{if } x = 1 \\ 5ax - 2b & \text{if } x < 1 \end{cases}$  is continuous at  $x = 1$ . find a, b

## BIOLOGY

### Assignment - I

#### CHAPTER 3: Human Reproduction

1. Due to congenital defect, a woman does not have fimbriae in the fallopian tube. How will it affect her?
2. What is the difference between spermiogenesis and spermiation?
3. What is the role of LH in a human male and female?
4. Justify giving reasons:
  - a. Corpus luteum secretes large amounts of progesterone if egg is fertilized.
  - b. During pregnancy there is an increase in the levels of hormones like estrogens, progesterone, cortisol, prolactin, thyroxine etc in maternal blood.
  - c. Colostrum is absolutely essential for the newborn.
  - d. Placenta can be referred to as 'transporting organ'.
5. List out the sequence of events after fertilization up to implantation of the human embryo.
6. How many primary follicles will be there at the time of puberty in the human ovary?

## CHAPTER 1: Reproduction in organism

1. Name the vegetative propagules in the following.  
i) Banana            ii) Agave            iii) Bryophyllum            iv) Water Hyacinth
2. Differentiate between the following .
  - a. Oviparous and viviparous
  - b. Pre-fertilization and post-fertilization events
3. How is the sexuality of papaya plant different from a maize plant?
4. In which organisms gametes are non motile? How do they reach the female gamete for fertilization?
5. Give reasons :
  - a) Rotifers are called Parthenocarpic organisms
  - b) Mammals living in natural wild condition are seasonal breeders
  - c) Water Hyacinth is called an invasive weed
  - d) Bamboo plants are considered to have unusual flowering response .
  - e) *Marchantia* is considered dioecious .

## Chapter-2 (Sexual Reproduction in flowering plants) ASSIGNMENT.

1. Draw a diagram of a matured microspore of an angiosperm. Label its cellular Components.
2. Give an example of plant which came into India as a contaminant and is cause of Pollen allergy.
3. The microscopic pollen grains of the past are obtained as fossils. Mention the characteristics of the pollen grains that makes it happen.
4. State the function of filiform apparatus found in mature embryo sac of an angiosperm.
5. What is the function of germ pore?
6. What is funiculus?
7. In maximum angiosperms grains are shed at the two-celled stage. Name the 2 cells.
8. Why do pollen grains of some flowers trigger sneezing in some people?
9. What is the site of microsporogenesis?
10. What is the site of megasporogenesis?
11. Differentiate between microsporogenesis and megasporogenesis. which type of cell division occurs during these events? Name the structure formed at the end of these two events.
12. With a neat, labeled diagram, describe the parts of atypical angiosperm ovule.
13. What is meant by monosporic development of a female gametophyte?
14. With a neat diagram and explain the 7-celled, 8-nucleate nature of the female gametophyte.
15. What are chasmogamous flowers? Can cross-pollination occur in cleistogamous flowers? Give reason for your answer.
16. Mention two strategies evolved to prevent self-pollination in flowers.
17. What is self-incompatibility? Why does self pollination not lead to seed formation in self-Compatibility species?
18. What is triple fusion? Where and how does it take place? Name the nuclei involved in triple Fusion.
19. Why do you think the zygote is dormant for sometime in a fertilized ovule?
20. Differentiate between:
  - (a) Hypocotyls and epicotyls
  - (b) Coleoptiles and coleorhizae
  - (c) Perisperm and pericarp

## **CHEMISTRY**

### **SOLID STATE (subjective)**

1. Which point defect in crystals does not alter the density of the relevant solid?
2. Which point defect in its crystal units alters the density of a solid?
3. Which point defect in its crystal units increases the density of a solid?
4. How do metallic and ionic substances differ in conducting electricity?
5. Which point defect of its crystals decreases the density of a solid?
6. What is the number of atoms in a unit cell of a face-centred cubic crystal?
7. Write a feature which will distinguish a metallic solid from an ionic solid.
8. Which point defect in crystals of a solid does not change the density of the solid?
9. Which point defect in crystals of a solid decreases the density of the solid?
10. What type of interactions hold the molecules together in a polar molecular solid?
11. What type of semiconductor is obtained when silicon is doped with arsenic?
12. Write a distinguishing feature of metallic solids.
13. 'Crystalline solids are anisotropic in nature.' What does this statement mean?
14. Which stoichiometric defect in crystals increases the density of a solid?
15. What is meant by 'doping' in a semiconductor?
16. Write a point of distinction between a metallic solid and an ionic solid other than metallic lustre.
17. How may the conductivity of an intrinsic semiconductor be increased?
18. Which stoichiometric defect increases the density of a solid?
19. What are n-type semiconductors?
20. What type of stoichiometric defect is shown by AgBr and AgI ?
21. What type of defect can arise when a solid is heated ?
22. Why does LiCl acquire pink colour when heated in Li vapours?
23. How many atoms constitute one unit cell of a face-centred cubic crystal?
24. What type of stoichiometric defect is shown by AgCl?
25. What type of substances would make better Permanent Magnets: Ferromagnetic or Ferrimagnetic?
26. Calculate the number of atoms in a face centred cubic unit cell.
27. On heating a crystal of KCl in potassium vapour, the crystal starts exhibiting a violet colour. What is this due to?
28. Which type of ionic substances show Schottky defect in solids?
29. How many atoms per unit cell (z) are present in bcc unit cell?
30. What type of stoichiometric defect is shown by NaCl?
31. Write a distinguishing feature between a metallic solid and an ionic solid.
32. Why are crystalline solids anisotropic?
33. What is meant by 'antiferromagnetism'?
34. Write a distinguishing feature of a metallic solid compared to an ionic solid.
35. What is the formula of a compound in which the element Y forms ccp lattice and atoms of X occupy 1/3rd of tetrahedral voids?
36. What is the formula of a compound in which the element Y forms ccp lattice and atoms of X occupy 2/3rd of tetrahedral voids?
37. What is the no. of atoms per unit cell (z) in a body-centred cubic structure?
38. What type of stoichiometric defect is shown by AgCl?
39. What type of magnetism is shown by a substance if magnetic moments of domains are arranged in same direction?
40. Give an example each of a molecular solid and an ionic solid.
41. A metallic element crystallises into a lattice having a pattern of AB AB ... and packing of spheres leaves out voids in the lattice. What type of structure is formed by this arrangement?
42. A metallic element crystallises into a lattice having a ABC ABC ... pattern and packing of spheres leaves out voids in the lattice. What type of structure is formed by this arrangement?
43. What type of Stoichiometric defect is shown by AgCl?
44. What type of stoichiometric defect is shown by NaCl?
45. Which ionic compound shows both Frenkel and Schottky defects?

## **PHYSICS**

### **(ELECTROSTATICS )PART 1**

1. Four point charges +5 mC, +2 mC, +10mC and +2 mC are kept at the corners of a square of side 10 cm. A charge  $q=+1\text{mC}$  is placed at its centre. Find the net force on q.
2. Calculate the distance between two protons such that the electrostatic force between them is equal to the weight of either.
3. Two point charges are 0.1 m apart and their combined charge is 9 mC. If they repel each other with a force 18N, then calculate the magnitude of each charge.
4. Calculate the coulomb force between two alpha particles separated by a distance of  $3.2 \times 10^{-15}$  m

5. A proton moves through a uniform electric field of  $5.01 \times 10^3 \text{ N/C}$ . Calculate (a) the acceleration with which the proton is moving and (b) the time taken by the proton to cover a distance of 4.8 cm.
6. How many electrons would have to be removed from or added to a penny to leave it charged with  $1.0 \times 10^{-6} \text{ C}$ ? [Ans:  $6.25 \times 10^{12}$ ]
7. An electrically neutral coin of mass  $m = 3.0 \text{ g}$  contains equal amount of positive and negative charge. Assuming the coin is made up of pure copper, what is the magnitude of the total positive (or negative) charge on the coin. Molar mass of copper =  $63.5 \text{ g mol}^{-1}$  [Ans:  $1.32 \times 10^5 \text{ mC}$ ]
8. What is the Coulomb's force between two small charged spheres having charges of  $2.0 \times 10^{-7} \text{ C}$  and  $3.0 \times 10^{-7} \text{ C}$  placed 30 cm in air? [Ans:  $6.0 \times 10^{-3} \text{ N}$ ]
9. Find the electrostatic force between two protons placed in free space separated by a distance 20 cm [Ans:  $5.76 \times 10^{-27} \text{ N}$ ]
10. The electrostatic force between 200mC and 500 mC placed in free space is 5 gf. Find the distance between the two charges. [Ans: 135.5 m]
11. A pith ball A of mass  $9 \times 10^{-5} \text{ kg}$  carries a charge of 5mC. What must be the magnitude and sign of the charge on another pith ball B held 2 cm directly above the pith ball A so that the pith ball remains stationary? [Ans:  $-7.84 \times 10^{-12} \text{ C}$ ]
12. Two similar charges repel each other with a force of 44.1 N when placed two cm apart in air. Calculate the strength of the charges. [Ans:  $\pm 1.4 \text{ mC}$ ]
13. The force between two charged objects is to be kept unchanged even though the charge on one of the objects is halved keeping the other the same. If  $d$  is the original separation between charges, then what is the new separation? [Ans:  $d/\sqrt{2}$ ]
14. The electrostatic force of repulsion between two positively charged ions carrying equal charges =  $3.7 \times 10^{-9} \text{ N}$  when they are separated by a distance of 5 Å. How many electrons are missing from each ion? [Ans: 2]
15. Two fixed point charges  $+4q$  and  $+2q$  units are separated by a distance  $x$ . Where should the third point charge be placed for it to be in equilibrium? [Ans: at a distance of  $0.59 x$  from  $+4q$ ]

## PART2

16. How far apart should two electrons be if the force of repulsion between them is equal to the weight of electron? [Ans: 5.1 m]
17. Two identical charges repel each other with force of 0.1 N when placed 0.5 m apart in air (a) Find the value of charges (b) Determine the magnitude of the charges if they were placed in a liquid whose permittivity is ten times that of the vacuum. [Ans. (a) 1.67 mC (b) 0.53 mC]
18. Two small spheres each of mass 10 mg are suspended from a point by threads 0.5 m long. They are equally charged and repel each other to a distance of 0.28 m. What is the charge on each?  $g = 10 \text{ ms}^{-2}$ . [Ans.  $1.59 \times 10^{-8} \text{ C}$ ]
19. The normal hydrogen atom consists of proton and an orbital electron. Assume the orbit to be circular with radius  $5.3 \times 10^{-11} \text{ m}$ . Find the force between the proton and electron by using Coulomb's law. [Ans.  $8.2 \times 10^{-8} \text{ N}$ ]
20. Two point charges  $q_1$  and  $q_2$  are 3 m apart and their combined charge is 20 mC. If one repel the other with a force of 0.075 N, what are the two charges?
21. Two equally charged identical spheres P and Q repel each other with a force of  $2 \times 10^{-5} \text{ N}$ . Another identical uncharged sphere R is touched to P, then placed at the midpoint between P and Q. Find net force on R. [Ans.  $2 \times 10^{-5} \text{ N}$ ]
22. Two sphere of charges  $+10 \text{ C}$  and  $+40 \text{ C}$  are placed 12 cm apart. Find the position of the point between them where force on  $+1 \text{ C}$  is zero. [Ans. 0.04 m from  $+10 \text{ C}$ ]
23. There are two equal charges each of 1.0 C. What should be the separation between them so that the force between them is equal to the weight of a 20 kg child? [Ans. 6.78 km]
24. Two equal charges are separated by 1 m. Calculate the magnitude of the charges so that the force between them is equal to the weight of a 20 kg child. [Ans.  $1.476 \times 10^{-4} \text{ C}$ ]
25. Two equal charges each of 1.0 C are separated by a distance of 1 cm. Calculate the mass of a body so that the force between these charges equals the weight of the body. [Ans.  $9.18 \times 10^{12} \text{ kg}$ ]
26. Two insulating spheres are rubbed against each other and are placed 1 mm apart. If they attract each other with a force of 2.0 N, how many electrons were transferred from one sphere to the other during rubbing? [Ans.  $9 \times 10^{10}$ ]

27. Two small pith balls are 1 cm apart in air and carry charges of  $2 \times 10^{-9} \text{ C}$  and  $-6 \times 10^{-9} \text{ C}$  respectively. Calculate the force of attraction. If the balls are touched and then separated by a distance of 1 cm, what will be the force between them? [Ans.  $108 \times 10^{-5} \text{ N}$  ;  $36 \times 10^{-5} \text{ N}$  repulsive]
28. Calculate the value of two equal charges if they repel one another with a force of 1 kgf when separated by a distance of 1 cm in air. Now, if the charges are situated in an insulating liquid having relative permittivity 8 times that of air, then what would be the magnitude of the charges if they exert the same force on each other? [Ans.  $0.33 \text{ mC}$  ;  $0.87 \text{ mC}$ ]
29. Five electrons have been removed from each atom to form ions. Find the electrostatic force between two such ions when separated by a distance of  $4 \text{ \AA}$  in air. [Ans,  $3.6 \times 10^{-8} \text{ N}$ ]
30. Four charges  $+4 \text{ mC}$ ,  $+5 \text{ mC}$ ,  $+4 \text{ mC}$  and  $+5 \text{ mC}$  are placed at the corners A, B, C and D of a square of side 10 cm. Calculate the force on a charge of  $+1 \text{ mC}$  placed at the centre of the square. [Ans.  $0 \text{ N}$ ]
31. Two identical metallic spheres P and Q. have charge on each as  $6 \times 10^{-7} \text{ C}$ . They are placed half meter away from each other. Another identical sphere R having no initial charge is first touched with sphere P and then with Q. Sphere R is then with drawn. Find the new force between P and Q. [Ans.  $4.86 \times 10^{-3} \text{ N}$ ]
32. Calculate the magnitude and direction of force on unit positive charge at the centre of a square of each side 2 m, when three charges of  $+8 \text{ mC}$  each are placed at the three corners of the square. [Ans.  $3.6 \times 10^4 \text{ N}$  towards the corner without charge]
33. Four equal charges each of  $+2 \text{ mC}$  are placed at the corners of a square of side 50 cm. Find the force on anyone of the charges. [Ans.  $275.6 \times 10^{-3} \text{ N}$  repulsive along the diagonal of square]
34. Two identical balls each carrying a charge Q are suspended from a common point by two strings of equal length l. Calculate the mass of each ball if the angle between "the strings is  $2\theta$  in equilibrium.
35. Two equally charged identical metal spheres A and B repel each other with a force of  $2.0 \times 10^{-5} \text{ N}$ . Another identical uncharged sphere C is touched to A and then placed at the mid point between A and B. What is the net force on C?
36. Derive an expression for the Electric field at a point on the (i) axial line and (ii) equatorial line of an electric dipole
37. State Gauss' theorem and apply it to find the electric field at a point due to
  - A point charge
  - A line of charge
  - A plane sheet of charge
  - A charged spherical conducting shell
38. Derive expression for the potential energy of a system of point charges. Derive expression for the torque on a dipole in a uniform electric field.
39. Derive expression for the work done in turning a dipole in a uniform electric field.
40. Derive an expression for the potential energy of a dipole in a uniform electric field

## MUSIC VOCAL

1. अलंकार किसे कहते हैं?
2. कण किसे कहते हैं?
3. खटका किसे कहते हैं?
4. मुर्की किसे कहते हैं?
5. मीड किसे कहते हैं?
6. ताल की दुगुन की एक मात्रा में कितने बोल होते हैं?
7. झपताल का परिचय 1 गुण 2 गुण 3 गुण व 4 गुण सहित लिखिए?
8. रूपक ताल का परिचय 1 गुण 2 गुण 3 गुण व 4 गुण सहित लिखिए?
9. रागों के समय सिद्धांत का विवरण विस्तार से दीजिए?
10. झप ताल में ताली वह खाली किस मात्रा पर है?
11. रूपक ताल में ताली वह खाली किस मात्रा पर है?

## INFORMATION TECHNOLOGY

- Q1. A complex sentence is a sentence that combines one ..... clause with at least one dependent clause.
- Q2. A ..... is a series of sentences that are organised and are all related to a single topic.
- Q3. Define DBMS.
- Q4. .... (Data/Information) is the collection of raw facts which have not been processed to reveal useful information.
- Q5. What is cardinality of a relation.
- Q6. Define primary key .
- Q7. SQL stands for.....
- Q8. What are Data types in SQL?
- Q9. My grandmother likes to ..... (hear/listen) to the radio.
- Q10. .... function counts the numbers of tuples in the result of the query. (COUNT/MIN)
- Q11. What are the characteristics of Database Management System?
- Q12. Explain any two types of verbal phrases with example.
- Q13. Briefly explain Drop table command with example
- Q14. Name the various parts of speech.
- Q15. Differentiate between Update and Delete command.

Q16. Explain different kinds of sentences with examples.

Q17. What are the advantages of using DBMS Approach?

Q18. Consider the following "Employee" table:-

Employee_ID	Employee_Name	Job_Title	Salary	Bonus	Age	Manager_ID
1201	Divya	President	50000	NULL	29	NULL
1205	Amyra	Manager	30000	2500	26	1201
1211	Rahul	Analyst	20000	1500	23	1205
1213	Manish	Salesman	15000	NULL	22	1205
1216	Megha	Analyst	22000	1300	25	1201
1217	Mohit	Salesman	16000	NULL	22	1205

The primary\_key of this table is Employee\_ID and Manager\_ID is a foreign key that references Employee\_ID.

Write the SQL commands for the following:-

- Create the above table.
- Delete the Employee having Employee\_ID 1217.
- Update the salary of Amyra to "40000"
- Write a query to display the names and Job\_title of employees having Manager\_ID=1201

## PHYSICAL EDUCATION

- Write the importance of measurement in sports.
- Explain briefly Rockport one mile test.
- What is the Rikli and Jones Senior Citizen fitness test?
- Write the formula for calculations of physical Efficiency Index in Harvard step test.
- What are the methods of measuring heart rate?
- Explain briefly the motor fitness test.
- Define the General motor fitness.
- Explain the Barrow three item general motor ability test.
- What do you understand by Measurement in sports?
- Who developed Harvard step test.
- What is the normal heart rate.
- Which test should suggest for your grandmother to test lower body flexibility.
- Explain the term flexibility.
- What test would you suggest to measure upper body strength for aged population?
- Which test Weill you suggest to measure general motor ability?
- Briefly explain 8 foot up and go test for agility of senior Citizen.
- Explain the eight foot up and go test for measuring agility dynamic balance.
- Explain the purpose and procedure of any two components of motor fitness.
- Your grandmother feels that she has reduced upper body flexibility and therefore. She wants to test herself. Which test would you suggest to her?
- What are the AAPHER tests?
- Meaning of AAPHER test.
- What are the modified push-up tests?
- Define the power with strength.
- How can we calculate score in partial curl up test?
- What are the heart rates?

## ACTIVITIES

### Guidelines to perform activities-

- Subject teachers will be providing videos regarding how to perform the activities in whatsapp group.
- Parents are requested to make videos of their wards performing various activities given in homework and sharing the same with subject teachers with name and class.

### ENGLISH

Speaking activity for ASL

- 1) Population explosion( Roll number -1to5)
- 2) Importance of learning through experience( Roll number -6 to 10)
- 3) internet privacy( Roll number 11 to 15)
- 4) Ancient education or modern education( Roll number 16 to 20)
- 5) Skills and hobbies I learnt in lockdown (Roll number 21 to 25)
- 6) Impact of smartphones( Roll number 26 onwards)