SAINIK SCHOOL KALIKIRI

LEARN TO LEAD (CBSE AFFIL: 180019)

"The highest education is that which does not merely give us information but makes our life in harmony with all existence."

SUMMER VACATION HOLIDAY HOMEWORK

2024 – 25

SAINIK SCHOOL KALIKIRI
HOLIDAY HOMEWORK
SUB : BIOLOGY
CLASS :XII

1. Prepare an Investigatory project of your choice on any biology topic of class XII.
   Ex: Blood groups,Disorders of Respiratory system etc..

2. Complete the worksheet.
   Ch-2 Sexual Reproduction in Flowering Plants
   1.Anther is a four sided structure consisting of four
   a. Theca
   b. Microsporangia
   c. Pollen grains
   d.Mega sporangia
   2. Statement I: Seed is the basis of agriculture.
   Statement II: Dehydration and dormancy of mature seed is crucial for storage of seeds.
   Statement III: Seeds of rice and wheat remain viable for several years at normal condition.
   a. Statements I and III are correct
   b. All statements are correct
   c. Statements I and II are correct
   d. Statements II and III are correct
   3. Assertion: Ovule develops into mature seeds and ovary develops into fruits.
   Reason: The fruits that develop only from ovary are called true fruits.
   a. Both assertion and reason are correct
   b. Assertion and reason both are incorrect
   c. Assertion is incorrect but reason is correct
   d. Assertion is correct but reason is incorrect
   4. Which of the following plant is not pollinated by water?
   a. Lotus
   b. Vallisneria
   c. Zostera
   d. Hydrilla
   5. Wind and water pollinated flowers are not very colorful and do not produce nectar because
   a. They are not pollinated by biotic factors
   b. Colour is not necessary for attention of bees
   c. Insects are not to be attracted
   d. Their color has been fade up
   6. Can an unfertilised, apomictic embryo sac give rise to a diploid embryo? If yes,then how?

7. If the chromosome number of a plant species is 20, what would be the chromosome number in its: (i) Pollen grains (ii) Endosperm cells?

8. Write the name of structure only thorough pollen tube enters within the embryo sac.

9.Write the name of condition in which pollen grains mature prior to stigma in bisexual reproduction.

10. Identify the types of flower shown in A and B. Which out of the two will produce an assured seed set.

11. How many haploid cells are present in a mature female gametophyte of a flowering plant? Name them.

12. What is apomixis and what is its importance?

13. Describe the structure of pollen grain and the process of its germination.

14. With a neat diagram explain the 7-celled,8-nucleate nature of the female gametophyte.

15. What develops into a microspore mother cell in a flower? Trace the development of this cell into a pollen grain which is ready for germination.Draw a labelled figure by a mature pollen grain.

Ch-3 Human Reproduction

1. Which of the following group of hormones are produced during pregnancy?

a.Progestogens,hPL and relaxin
b.hCG,hPL and relaxin
c.Estrogens, hPL and relaxin
d.hCG,estrogens and relaxin

2.Which one is correctly matched pair

a.Colostrum :secretion found in seminal fluid
b.Clitoris : male external gene
c.Coitus : Sexual intercourse
d.Ovary : pigmented circular area around the nipple

3. In human beings, fertilization of egg takes place in

a. Ovary
b. Oviduct
c. Vagina
d. Uterus

4. Five oogonia yield 10 primary oocytes, then how many ova are produced on completion of oogenesis?

a. 40
b. 20
c. 5
d. 10

5. Failure of testes to descend into scrotum is called

a. Archentronism
b. Testinolism
c. Cryptochidism
d. Copulation

6. Androgens are produced by Sertoli cells.(True/False)

7. Some organisms like honey bees are called parthenogenetic animals. (Give reason)

8. Which part in the male reproductive system stores sperms?

9.Leydig cells are found in theovary.(True/False)

10.Write the location and function of the sertoli cells in humans.

11.Name the hormone responsible for the descent of testes into the scrotum. Why Does the failure of the process result in sterility?

12.Study the following flow chart.Name the hormones involved in each state. Explain their functions.

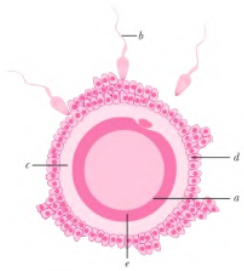
Hypothalamus
↓
Pituitary
↓
ovary

↓

Pregnancy

13.Draw a labeled diagram of male reproductive system.

14.Study the illustration given below and



i. Identify 'a'
ii. Name and state the function of 'c'.
iii.Identify 'd'
iv.Explain the role of hormones in the formation and releases of 'a'

v.Draw a diagram of 'b' separately and label the parts: a.that helps its entry into 'a'
b. that carry genetic materials c.that helps in its movement.

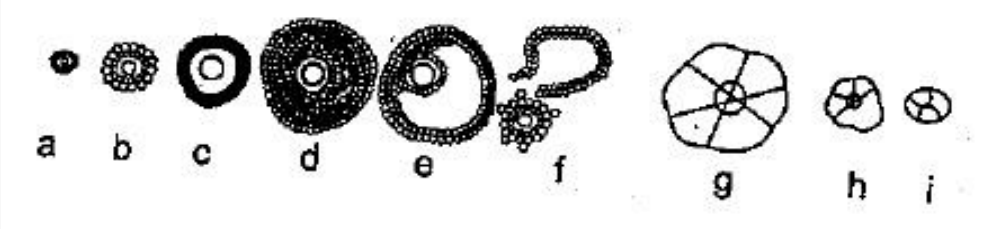
15. The following is the illustration of the sequence of ovarian events " a " to " i " in a human female:

(a) Identify the figure that illustrates corpus luteum and name the pituitary hormone that influences its formation.

(b) Specify the endocrine function of corpus luteum. How does it influence the uterus? Why is it essential?

(c) What is the difference between " d " and "e"?

(d) Draw a neat labelled sketch of Graafian follicle.



Ch-4 Reproductive Health

1. Which one of the following technique is used in test-tube baby programme
a. Intracytoplasmic Sperm Injection
b. Gamete Intra-Fallopian transfer
c. Zygote Intra Fallopian transfer
d. Intra-Uterine Insemination
2. The maximum growth rate occur in
a. Senescent phase
b. Exponential phase
c. Lag phase
d. Stationary phase
3. First test-tube baby born in July,1978 was
a. Louse Edwards
b. Patric Steptoe
c. Robert Brown
d. Louise Brown
4. A mother of one year old daughter wanted to space between her children. The best contraceptive method she should use is
a. Oral contraceptives

b. Copper-T
c. Tubectomy
d. Diaphragm
5. What is meant by RCH care?
a. Reproductive and child health care
b. Regenerative and child health protection
c. Reproduction and choice of health
d. Rare critical health
6. Suggest any two contraceptive methods which are very effective to avoid emergency pregnancy.
7. Creating awareness about sex related aspects is an effective method to improve reproductive health of the people. (True/False)
8. Correct the following statements: Are all sexually transmitted diseases completely curable ?
9. Why is hormone releasing IUD considered as a good contraceptive to space children?
10. What are the suggested reasons for population explosion?
11. In the table given below, select and enter one correct device out of the following: Oral pill, Condom,Copper T, Saheli, Vasectomy, Diaphragm,Tubectomy, Cervical cap

Method of birth control	Device
(a) Barrier	
(b) IUD	
(c) Surgical Technique	
(d) Administering Hormones	

12. What are the measures one has to take to prevent from contracting STDs?
13. Ratan lives in a remote village. Suddenly he comes to know that his father has arranged the marriage of his younger sister, who is only 14 years old, to a well-to -do middle aged man living in a nearby village. Ratan objected to his father's act. Ratan was not convinced by his father's idea that a better groommight not be available later. Ratan complained to the village head and got the problem was solved.
a) Did Ratan act properly by approaching the village head? Why/ Why not?
b) What biological considerations made Ratan object to his father's decision?
c) What values and responsibilities did Ratan show?
14. Why medical termination of pregnancy is done? Is MTP legalized in India?
15. Define population density. What are consequences of high populationdensity?

SAINIK SCHOOL KALIKIRI

CLASS-XII COMPUTER SCIENCE

HOLIDAY HOMEWORK

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1. Write a python program to find the area of a triangle?
2. Write a python program to convert kilometer to miles?
3. Write a python program to find given year is leap year or not?
4. Write a python program to find factors of a number?
5. Write a python program to try different types of slicing in the given string?
6. Write a python program to find the count of occurrence of a particular data item in a list?
7. Write a python program to find the given string is an anagram or not?
8. Write a python program to find given string is a palindrome or not?
9. Write a python program to check whether the last digit is 7 or not?
10. Write a python program to check the value is present in the dictionary or not?

Note: Revision of chapter 1, chapter2.

SAINIK SCHOOL KALIKIRI

CLASS-XII ENGLISH

HOLIDAY HOMEWORK

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1) Project work topic: Plight of old aged people.(PPT WORK)
2) My mother at Sixty Six (About the poet, theme, summary and important words and their meanings)
3) Keeping Quiet (About the poet, theme, summary and important words and their meanings)

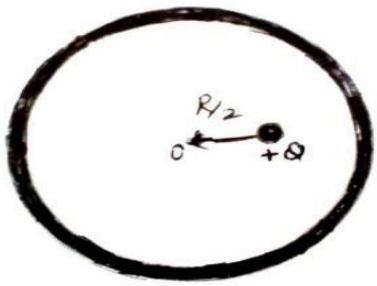
Note: All PPT's should be submitted to respective subject teacher E-Mail Id.

CLASS XII SUMMER HOLIDAY HOMEWORK

(To be submitted on foolscape sheets by 19-06-2024)

TWO MARKS QUESTIONS:

1)Figure shows a point charge +Q, located at a distance R/2 from the centre of a spherical metal shell. Draw the electric field lines for the given system.Justify.



2) Represent graphically the variation of electric field with distance, for a uniformly charged (i)plane sheet and (ii)thin spherical shell.

3) In the given figure, charge +Q is placed at the centre of a dotted circle. Work done in taking another charge +q from A to B is W1 and from B to C is W2. Which one of the following is correct: W1 > W2, W1=W2 and W1 < W2?

4) If 10^9 electrons move out of a body to another body every second, how much time is required to get a total charge of 1 C on the other body?

5) Write the SI unit and dimensional formulae of (i) permittivity (ii) electric flux

6) (a) Explain the meaning of the statement 'electric charge of a body is quantised'.

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

7) Answer the following (2 mk each)

(a) A comb run through one's dry hair attracts small bits of paper. Why? What happens if the hair is wet or if it is a rainy day? (Remember, a paper does not conduct electricity.)

(b) Ordinary rubber is an insulator. But special rubber tyres of aircraft are made slightly conducting. Why is this necessary?

(c) Vehicles carrying inflammable materials usually have metallic ropes touching the ground during motion. Why?

(d) A bird perches on a bare high power line, and nothing happens to the bird. A man standing on the ground touches the same line and gets a fatal shock. Why?

8).Obtain an expression for equivalent capacity of three capacitors connected in (i) series (ii) parallel.(2 mk each)

9). Two charges 3×10^{-8} C and -2×10^{-8} C are located 15 cm apart. At what point on the line joining the two charges is the electric potential zero? Take the potential at infinity to be zero.

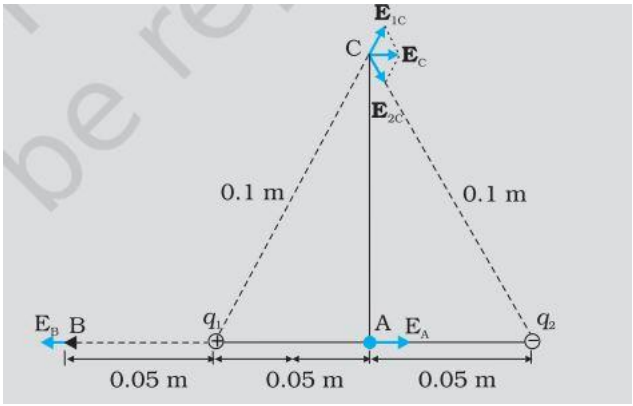
10). A molecule of a substance has a permanent electric dipole moment of magnitude 10^{-29} C m. A mole of this substance is polarised (at low temperature) by applying a strong electrostatic field of magnitude 10^{6} V m^{-1}. The direction of the field is suddenly changed by an angle of 60º. Estimate the heat released by the substance in aligning its dipoles along the new direction of the field. For simplicity, assume 100% polarisation of the sample.

11).A slab of material of dielectric constant K has the same area as the plates of a parallel-plate capacitor but has a thickness (3/4)d, where d is the separation of the plates. How is the capacitance changed when the slab is inserted between the plates?

THREE MARKS QUESTIONS

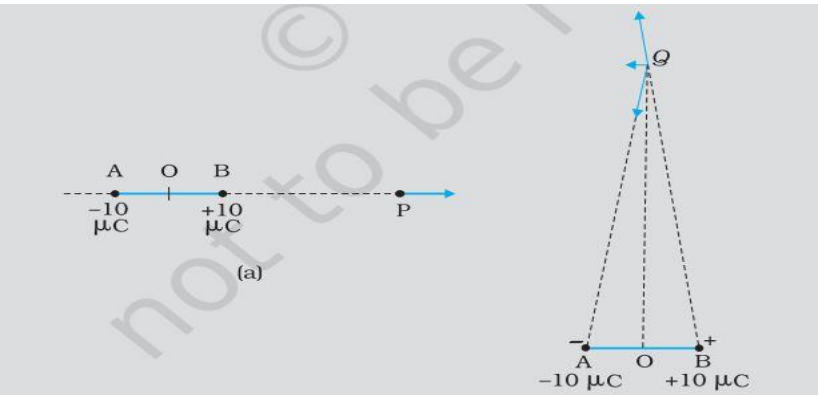
12.Consider the charges q, q, and –q placed at the vertices of an equilateral triangle. What is the force on each charge?

13.Two point charges q1 and q2 , of magnitude $+10^{-8}$ C and -10^{-8} C, respectively, are placed 0.1 m apart. Calculate the electric fields at points A, B and C.



14.Two charges ±10 mC are placed 5.0 mm apart. Determine the electric field at (a) a point P on the axis of the dipole 15 cm away from its centre O on the side of the positive charge, as shown in Fig., and

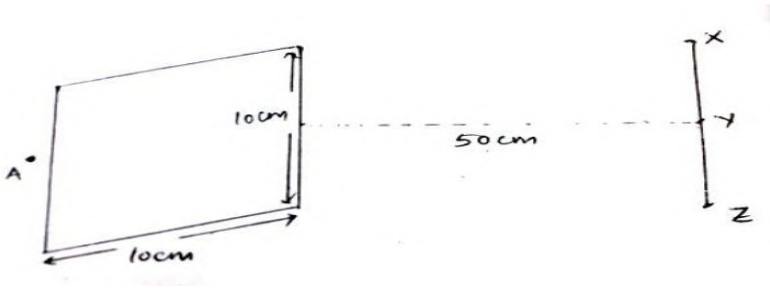
(b) a point Q, 15 cm away from O on a line passing through O and normal to the axis of the dipole,



15.Given a uniformly charged plane/ sheet of surface charge density $\sigma = 2X10^{17}$ C/m^2 .

(i) Find the electric field intensity at a point A, 5mm away from the sheet on the left side.

(ii) Given a straight line with three points X, Y & Z placed 50 cm away from the charged sheet on the right side. At which of these points, the field due to the sheet remain the same as that of point A and why?



16) If N drops of same size each having the same charge, coalesce to form a bigger drop. How will the following vary with respect to single small drop? (i) Total charge on bigger drop (ii) Potential on the bigger drop (iii) Capacitance.

17)State Gauss's law.Prove Gauss law using Coulomb's law.

18)Using Gauss law find electric field intensity at a point near a thin,uniformly charged wire.

19)Using Gauss law derive an expression for electric field intensity at a point near a uniformly charged infinite plane sheet.

20)Using Gauss law derive an expression for electric field intensity at a point due to a uniformly charged thin spherical shell.

21)Obtain an expression for electric potential at a point due to a point charge.

22)(a) A 900 pF capacitor is charged by 100 V battery . How much electrostatic energy is stored by the capacitor? (b) The capacitor is disconnected from the battery and connected to another 900 pF capacitor . What is the electrostatic energy stored by the system?

FIVE MARKS QUESTIONS

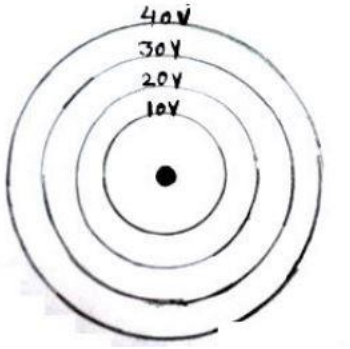
23)An electron falls through a distance of 1.5 cm in a uniform electric field of magnitude 2.0×10^4 NC^{-1} . The direction of the field is reversed keeping its magnitude unchanged and a proton falls through the same distance . Compute the time of fall in each case. Contrast the situation with that of 'free fall under gravity'.

24)Four charges are arranged at the corners of a square ABCD of side d, as shown in Fig. 2.15.(a) Find the work required to put together this arrangement. (b) A charge q0 is brought to the centre E of the square, the four charges being held fixed at its corners. How much extra work is needed to do this?

25) (a) Two isolated metal spheres A and B have radii R and 2R respectively, and same charge q. Find which of the two spheres have greater : (i) Capacitance and (ii) energy density just outside the surface of the spheres. (2)

(b) (i) Show that the equipotential surfaces are closed together in the regions of strong field and far apart in the regions of weak field. Draw equipotential surfaces for an electric dipole. (1+1)

(ii) Concentric equipotential surfaces due to a charged body placed at the centre are shown. Identify the polarity of the charge and draw the electric field lines due to it. (1)



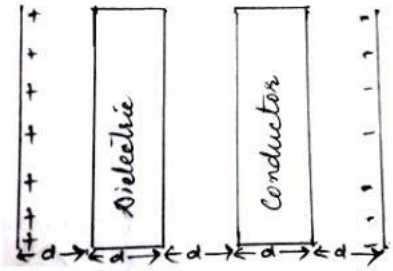
26)

(a) Compare the individual dipole moment and the specimen dipole moment for H_2O molecule and O_2 molecule when placed in
(i) Absence of external electric field (ii) Presence of external electric field. Justify your answer. (2)

(b) Given two parallel conducting plates of area A and charge densities + σ & -σ. A dielectric slab of constant K and a conducting slab of thickness d each are inserted in between them as shown.

(i) Find the potential difference between the plates.

(ii) Plot E versus x graph, taking x=0 at positive plate and x=5d at negative plate. (3)



27)

Write the expression for the energy stored in the capacitor. Also find the energy lost when the charged capacitor is disconnected from the source and connected in parallel with the uncharged capacitor. Where does this loss of energy appear? (1+3+1)

28) Write various forms of expressions for energy stored in a capacitor?Hence obtain an expression for its energy density.

29) Two capacitors are connected in parallel.Find the expression for the common potential and loss in energy.

30)

(a) An electric dipole is held in uniform electric field.

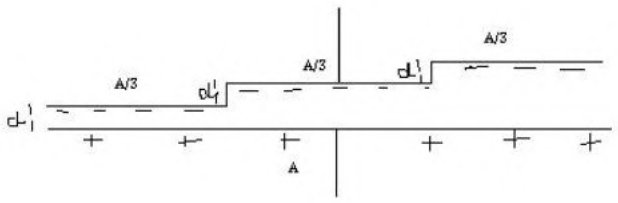
(b) (i) Using suitable diagram, show that it does not undergo any translatory motion. (1)

(iii) Define torque, giving its SI unit; derive an expression for the torque acting on this dipole. (2)

Obtain an expression for electric potential at a point due to an electric dipole.

What is the value of electric potential due to a dipole at (i) axial point (ii)equatorial point.

(c) A capacitor is made of a flat plate of area A and second plate having a stair like structure as shown in figure below. If width of each stair is A/3 and height is d. Find the capacitance of the arrangement. (2)



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NCC Holiday Homework Instructions

To make the most of your NCC holiday homework, we've streamlined the process for you. Follow these steps to ensure you complete your tasks effectively:

Download the DGNCC Training App(i.e. https://play.google.com/store/apps/details?id=com.chl.ncc): Head over to the Google Play Store and install the DGNCC Training App on your device. This app is your gateway to accessing essential NCC training materials.

Navigate to "Presis": Once the app is installed, open it and click on the "Presis" section. Here, you'll find a range of resources tailored to your NCC training needs.

Access Junior Cadets Content: Within "Presis," locate the section dedicated to Junior Cadets. This is where you'll find content specifically designed for cadets like you.

Download "Common Subjects": Under the Junior Cadets section, look for the option to download "Common Subjects." This contains valuable material pertinent to your NCC training.

Explore Official NCC SD Common Subject Content: Once downloaded, delve into the official release of NCC SD Common Subject content. This material is curated to enrich your understanding of essential subjects.

Read and Summarize: Your task is to thoroughly read the common subject content. Choose any 15 chapters that pique your interest, and submit important headings from each chapter.

Remember, this holiday homework is not just about completing tasks but also about deepening your knowledge and understanding of NCC principles. Should you have any questions or encounter any difficulties, don't hesitate to reach out for assistance. (+91 7981070167 ANO S/O Jagdish Babu)

Best wishes for a productive holiday period!

Dept of NCC, Sainik School Kalikiri

SAINIK SCHOOL KALIKIRI
CLASS 12 – CHEMISTRY HHW
2024-25

1	The increase in the temperature of the aqueous solution will result in its: a) Molarity to decrease b) Mass % to increase c) Molarity to increase d) Mole fraction to increase
2	25mLof a solution of barium hydroxide on titration with0.1molarsolution of hydrochloric acid give a titre value of35mL. The molarity of Barium hydroxide solution is a) 0.14 b) 0.28 c) 0.07 d) 0.35
3	The osmotic pressure of a solution containing 0.02 mole of solute at 300 K will be: a) $0.02 \times 0.0821 \times 300\ atm$ b) $\frac{0.02\times300}{0.0821}atm$ c) $0.03 \times 0.821 \times 300\ atm$ d) $\frac{0.02\times0.0821}{300}atm$
4	In which unit, the concentration of solution remains independent of temperature a) formality b) normaility c) molality d) molarity
5	Which among the following is soluble in water? a) Phenol b) Formic acid c) Benzene d) Chloroform
6	Which has highest freezing point at 1 atm? a) 0.1 molal sugar solution b) 0.1 molal $BaCl_2$ solution c) 0.1 molal NaCl solution d) 0.1 molal$FeCl_3$ solution
7	Which of the following is **not** true about enantiomers? a) They have the same specific rotation. b) They have the same chemical reactivity. c) They have the same density. d) They have the same melting or boiling point.
8	At equilibrium, the rate of dissolution of a solid solute in a volatile liquid solvent is _____. a) greater than the rate of crystallisation b) less than the rate of crystallisation c) zero d) equal to the rate of crystallisation
9	The temperature at which the vapour pressure of a liquid equals external pressure is called: a) m.p b) fp c) critical temperature d) b.p
10	The tanks used by divers are filled with air diluted with a) Helium b) Argon c) Nitrogen d) Hydrogen

11	Which among the following form nearly ideal solutions? a) Chloroform and benzene b) Benzene and Toluene c) Alcohol and water d) Acetone and aniline
12	Which one of the following pairs will **not** form an ideal solution? a) Hexane and Heptane b) Nitric acid and Water c) Ethyl chloride and Ethyl bromide d) Benzene and Toluene
13	Ethylene glycol is added to water as antifreeze. It will a) Only decrease the freezing point of water b) Only increase the boiling point of water c) Increase the freezing point of water in winter and boiling point in summer d) It is used to clean the radiator in car
14	Which of the following colligative properties is associated with the concentration term molarity? a) Osmotic pressure b) Lowering of vap. pressure c) Elevation in b.p. d) Depression in f.p.
15	50 mL of an aqueous solution of glucose $C_6 H_{12} O_6$ (Molar mass: 180 g/mol) contains 6.02×10^{22} molecules. The concentration of the solution will be a) 2.0 M b) 0.1 M c) 1.0 M d) 0.2 M
16	Mathematical expression relating molarity and molality is a) $\frac{\rho}{M} = \frac{1}{m} + \frac{Mass\ of\ solute}{1000}$ b) $\frac{\rho}{M} = \frac{1}{m} + \frac{Mass\ of\ solution}{1000}$ c) $\frac{M}{\rho} = \frac{1}{m} + \frac{Mass\ of\ solute}{1000}$ d) $\frac{\rho}{m} = \frac{1}{M} + \frac{Mass\ of\ solvent}{1000}$
17	Liquid ammonia bottle is first cooled before opening because a) Vapour pressure increases on cooling b) Vapour pressure Same on cooling c) Vapour pressure decreases on cooling d) Vapour pressure of liquid ammonia is very low at room temperature
18	The value of Henry's constant K_H is _____. a) greater for gases with lower solubility. b) constant for all gases. c) greater for gases with higher solubility. d) not related to the solubility of gases.
19	Considering the formation, breakingand strength of hydrogen bond, predict which of the following mixtures will show a positive deviation from Raoult's law? a) Chloroform and acetone. b) Nitric acid and water. c) Phenol and aniline. d) Methanol and acetone.
20	4L of 0.02 M aqueous solution of NaCl was diluted by adding one litreof water. The molarity of the resultant solution is _____. a) 0.016

	b) 0.012 c) 0.008 d) 0.004
21	Calculate the mass of ascorbic acid (Vitamin C, $C_6 H_8 O_6$) to be dissolved in 75 g of acetic acid to lower its melting point by 1.5 ^{o} C. K_f = 3.9 K kg mol $^{-1}$.
22	18 g of glucose, $C_6 H_{12} O_6$, is dissolved in 1 kg of water in a saucepan. At what temperature will water boil at 1.013 bar? K_b for water is 0.52 K kg mol $^{-1}$.
23	1. State the factors affecting the vapour pressure of a liquid. 2. Suggest the most important type of intermolecular attractive interaction in the following pairs: a. n - hexane and n - octane b. I_2 and CCl_4
24	A sample of drinking water was found to be severely contaminated with chloroform ($CHCl_3$) supposed to be a carcinogen. The level of contamination was 15 ppm (by mass): 1. express this in percent by mass. 2. determine the molality of chloroform in the water sample.
25	Using Raoult's law explain how the total vapour pressure over the solution is related to the mole fraction of components in the following solutions. 1. $CHCl_3$ (l) and CH_2Cl_2 (l) 2. NaCl(s) and H_2O (l)
26	An electrolyte AB is 50% ionized in aqueous solution. Calculate the freezing point of 1 molal aqueous solution.
27	Why do gases always tend to be less soluble in liquids as the temperature is raised?
28	Define the terms: Van't Hoff factor
29	Give reason: 1. Measurement of osmotic pressure method is preferred for the determination of molar masses of macromolecules such as proteins and polymers. 2. Aquatic animals are more comfortable in cold water than in warm water. 3. Elevation of boiling point of 1 M KCl solution is nearly double than that of 1 M sugar solution.
30	1. Find the van't Hoff factor for aqueous KCl, assuming complete dissociation. 2. A solution of an organic compound is prepared by dissolving 68.4 g in 1000 g of water. Calculate the molar mass of the compound when elevation in boiling point is 0.104 K and K_b for water is 0.52 K kg mol $^{-1}$.
31	Concentration terms such as mass percentage, ppm, mole fraction and molality are independent of temperature, however, molarity is a function of temperature. Explain.
32	If the solubility product of CuS is 6×10^{-16}, calculate the maximum molarity of CuS in aqueous solution.
33	What is osmotic pressure and how is it related to the molecular mass of a non volatile solute?
34	What is meant by: 1. Colligative properties? 2. Molality of a solution?
35	At 300 K, 36 g of glucose present in a litre of its solution has an osmotic pressure of 4.98 bar. If the osmotic pressure of the solution is 1.52 bars at the same temperature, what would be its concentration?
36	What is the mole fraction of a solute, in 2.5 m aqueous solution?
37	Determine the osmotic pressure of a solution prepared by dissolving 25 mg of K_2SO_4 in 2 litre of water at 25°C, assuming that it is completely dissociated.
38	A solution containing 8 g of a substance in 100 g of diethyl ether boils at$36.86^0\ C$, whereas pure ether boils at $35.60^0\ C$. Determine the molecular mass of the solute. [For ether, K_b = $2.02 Kkgmol^{-1}$]
39	Calculate the mole fraction of ethylene glycol ($C_2H_6O_2$) in a solution containing 20% of $C_2H_6O_2$ by mass.
40	Calculate the mass of a non - volatile solute

	(molar mass 40 g mol^{-1}) which should be dissolved in 114 g octane to reduce its vapour pressure to 80%.
41	**Read the text carefully and answer the questions:** In order to overcome the scarcity of drinking water in a remote village in Gujarat, Arnav and Aariv two young entrepreneurs still in their high school, have developed a unique water purifier that is capable of converting sea water into drinking water. It works on the principle of concentration difference between two solutions. 1. Name the phenomenon/process based on which this product is made? 2. How difference in concentration of solutions help in converting sea water into drinking water? 3. What arrangement they must have created in their product to covert sea water into drinking water? 4. Equimolar solutions of NaCl and glucose are not isotonic. Why?
42	**Read the text carefully and answer the questions:** The colligative properties of electrolytes require a slightly different approach than the one used for the colligative properties of non - electrolytes. The electrolytes dissociate into ions in solution. It is the number of solute particles that determines the colligative properties of a solution. The electron solutions, therefore, show abnormal colligative properties. To account for this effect we define a quantity called the van't Hoft factor, given by i = $\frac{Actual\ number\ of\ particles\ in\ solution\ after\ dissociation}{Number\ of\ formula\ units\ initially\ dissolved\ in\ solution}$ i = 1 (for non - electrolytes); i > 1 (for electrolytes, undergoing dissociation) i < 1 (for solutes, undergoing association). 1. 0.1M K_4 [$Fe(CN)_6$] is 60% ionized. What will be its van't Hoff factor? 2. When a solution of benzoic acid dissolved in benzene such that it undergoes in molecular association and its molar mass approaches 244. In which form Benzoic molecules will exist?
	3. How does van't Hoff factor **i** and degree of association **a** are related if benzoic acid undergoes dimerisation in benzene solution? (i = $1\frac{-\alpha}{2}$ or i = 1 + α) 4. What do you mean by colligative properties of solutions?
43	**Read the text carefully and answer the questions:** The concentration of a solute is very important in studying chemical reactions because it determines how often molecules collide in solution and thus indirectly determines the rate of reactions and the conditions at equilibrium. There are several ways to express the amount of solute present in a solution. The concentration of a solution is a measure of the amount of solute that has been dissolved in a given amount of solvent or solution. Concentration can be expressed in terms of molarity, molality, parts per million, mass percentage, volume percentage, etc. 1. A solution is prepared using aqueous KIwhich is turned out to be 20 w/w. The density of KI is 1.202 g/mL. The molality of the given solution and mole fraction of solute are respectively: a) 3.0 m, 0.0352 b) 2.5 m, 0.0569 c) 1.95 m, 0.120 d) 1.5 m, 0.0263 2. The density of KI is 1.202 g/mL. The molarity (in mol L^{-1}) of the given solution will be a) 0.263 b) 1.44 c) 1.89 d) 1.56 3. Which of the following is correct relationship between mole fraction and molality? a) $x_2 = \frac{mM_1}{1-mM_1}$

	b) $x_2 = \frac{1-mM_1}{mM_1}$ c) $x_2 = \frac{mM_1}{1+mM_1}$ d) $x_2 = \frac{1+mM_1}{mM_1}$ 4. Which of the following is temperature - dependent? a) Massfraction b) Mass percentage c) Mole fraction d) Molarity 5. Which of the following is true for an aqueous solution of the solute in terms of concentration? a) 1 M = 1 m b) Cannot be predicted c) 1 M < 1 m d) 1 M > 1 m
44	**Read the text carefully and answer the questions:** The properties of the solutions which depend only on the number of solute particles but not on the nature of the solute are called colligative properties. Relative lowering in vapour pressure is also an example of colligative properties. For an experiment, sugar solution is prepared for which lowering in vapour pressure was found to be 0.061 mm of Hg. (Vapour pressure of water at 20 ^{o} C is 17.5 mm of Hg.) 1. Relative lowering of vapour pressure for the given solution is: a) 0.00348 b) 0.061 c) 0.122 d) 1.75 2. The vapour pressure (mm of Hg) of solution will be: a) 17.5 b) 0.61 c) 0.00348 d) 17.439 3. Mole fraction of sugar in the solution is: a) 0.061 b) 0.00348 c) 1.75 d) 0.9965 4. If the weight of sugar taken is 5 g in 108 g of water then molar mass of sugar will be: a) 358 b) 400 c) 120 d) 240 5. The vapour pressure (mm of Hg) of water at 293 K when 25 g of glucose is dissolved in 450 g of water is: a) 17.02 b) 17.2 c) 17.4 d) 17.120
45	0.6 mL of acetic acid (CH_3 COOH), having density 1.06 g mL^{-1} , is dissolved in 1 litre of water. The depression in freezing point observed for this strength of acid was 0.0205 ^{o} C. Calculate the van't Hoff factor and the dissociation constant of acid.
46	Benzene and toluene form ideal solution over the entire range of composition. The vapour pressure of pure benzene and naphthalene at 300 K are 50.71 mm Hg and 32.06 mm Hg respectively. Calculate the mole fraction of benzene in vapour phase if 80 g of benzene is mixed with 100 g of toluene.
47	1. Explain the following phenomena with the help of Henry's law. a. Painful condition known as bends.

	b. Feeling of weakness and discomfort in breathing at high altitude. 2. Why soda water bottle kept at room temperature fizzes on opening?
48	4.0 g of NaOH are contained in one decilitre of solution. Calculate the following: 1. Molality fraction of NaOH 2. Molarity of NaOH 3. Molality of NaOH Density of solution = 1.038 g/cm^3
49	1. Explain giving examples the term colligative molality. Why do we sometimes get abnormal molecular masses of the substances using colligative properties of the solutions?

	2. The freezing point depression of 0.1 molal solution of benzoic acid in benzene is 0.256 K. For benzene k_f is 5.12 K kg mol $^{-1}$. Calculate the value of Van't Hoff factor for benzoic acid in benzene. What conclusion can you draw about the molecular state of benzoic acid in benzene.

SAINIK SCHOOL KALIKIRI

AY 2024-25

SUMMER VACATION HOLIDAY HOMEWORK - NDA

CLASS XII-MATHEMATICS

Solve the NDA previous year questions pertaining to the following Chapters of Class 11 & 12 (Covered Syllabus till May 2024).

Class XI

1. Sets, Relations, Functions and Number System
2. Polynomial, Quadratic Equation & Inequalities
3. Sequence and Series
4. Complex Numbers
5. Binomial Theorem, Mathematical Induction
6. Permutation and Combination
7. Cartesian Coordinate System and Straight Line
8. Pair of Straight Lines
9. Circles
10. Conics- Parabola, Ellipse & Hyperbola
11. Trigonometry- Ratio & Identity, Trigonometric Equations
12. Properties of Triangle
13. Height & Distance
14. Functions, Limit

Class XII

15. Relations and Functions
16. Inverse Trigonometric Functions
17. Matrices
18. Determinants

REFERENCES

NDA/NA 16 years Mathematics Topic-wise Solved Papers Disha Publication
https://drive.google.com/file/d/1fUCMSoey197y0bBvD_evI8GLblCSVnLQ/view

DETAILED BREAKUP OF QUESTIONS (2007-21)

	2007		2008		2009		2010		2011		2012		2013		2014		2015		2016		2017		2018		2019		2020	2021
CHAPTERS NAME	I	II	I	II	I	II	I	II	I	II	I	II	I	II	I	II	I	II	I	II	I	II	I	II	I	II	I	I
Set, Relation, Function and Number System	10	13	11	9	13	18	9	9	16	5	14	7	13	12	13	8	8	8	17	13	7	5	11	8	10	12	10	7
Polynomial, Quadratic Equation & Inequalities	11	11	6	9	7	7	7	5	11	11	7	3	8	7	2	2	5	5	6	7	5	7	2	4	14	14	3	5
Sequence and Series	3	10	4	9	4	5	6	3	7	7	7	7	2	3	2	5	2	2	5	9	8	6	5	7	4	9	1	7
Complex Numbers	4	2	6	3	3	5	5	5	3	8	2	3	2	2	4	3	5	6	4	2	5	3	7	2	5	2	2	5
Binomial Theorem, Mathematical Induction	2	2	4	1	1	2	1	4	1	2	2	0	1	2	4	5	1	3	1	2	2	4	5	2	3	2	3	4
Permutation and Combination	1	3	3	3	4	3	3	3	6	2	1	1	2	3	5	0	4	2	5	4	1	2	3	4	3	3	3	2
Cartesian Co-ordinate System, Straight Line	6	3	4	3	3	3	3	6	8	6	6	10	8	9	0	4	7	7	4	4	6	4	8	5	8	3	6	6
Pair of Straight Lines	0	0	0	1	0	0	0	0	0	0	0	1	0	5	0	1	2	1	0	2	1	1	1	0	0	1	1	1
Circles	2	2	3	2	1	1	1	2	1	1	0	0	1	2	0	0	0	0	2	3	2	1	0	2	2	-	1	2
Conics - Parabola, Ellipse & Hyperbola	2	2	1	3	3	2	5	2	2	2	2	2	2	4	5	5	2	2	4	2	1	3	1	0	3	1	2	2
Trigonometry : Ratio & Identity, Trigonometric Equation	10	8	10	7	13	14	7	12	4	10	19	8	9	7	11	11	5	6	8	8	8	4	8	7	18	11	19	11
Properties of Triangle, Inverse Trigonometric Function	3	6	5	3	5	4	5	2	7	6	5	1	2	1	4	6	9	4	5	4	1	4	5	3	4	3	4	4
Height & Distance	1	1	1	1	2	1	1	2	1	4	4	2	3	2	2	1	2	2	1	2	1	2	3	2	1	1	-	2
Functions, Limits, Continuity and Differentiability	7	3	8	9	5	4	10	7	3	0	5	8	7	6	11	9	7	9	9	9	12	17	10	11	6	6	8	7
Derivatives	0	3	7	2	5	8	4	4	1	2	3	4	6	4	0	2	2	2	5	5	2	3	2	2	2	3	4	3
Application of Derivatives	7	4	3	5	7	4	6	5	3	6	5	3	2	3	5	4	8	6	4	3	2	5	2	4	1	6	6	5
Indefinite Integration	2	1	2	3	3	2	4	3	3	1	2	3	2	3	0	0	4	6	1	2	3	2	1	3	2	2	4	3
Definite Integration & its applications	3	5	2	3	2	3	3	6	4	4	3	5	6	7	5	6	8	5	3	3	4	4	10	3	3	3	4	3
Differential Equation	6	5	2	6	2	3	5	6	5	2	3	7	5	3	13	4	6	6	5	4	6	4	5	7	5	6	4	4
Matrices and Determinants	8	11	11	7	10	8	9	9	8	7	11	8	7	9	6	10	7	8	11	11	12	9	3	15	7	5	8	11
Probability and Probability Distribution	6	4	6	7	8	6	8	4	6	5	3	10	11	10	5	13	8	8	2	6	9	11	8	7	16	8	10	5
Vectors	9	6	9	10	7	7	8	8	8	6	7	8	6	6	2	10	7	7	12	6	6	6	5	8	5	5	5	5
3 D-Geometry	6	7	5	7	6	6	8	2	5	4	5	8	7	1	13	7	4	8	2	8	6	5	5	4	4	5	5	5
Statistics	7	6	6	7	6	6	4	10	7	19	5	11	8	9	8	4	7	7	4	5	10	8	10	10	4	9	10	11

DETAILED SYLLABUS

ALGEBRA

- Sets, Venn diagrams, De Morgan laws, Cartesian product, relation, equivalence relation.
- Real numbers, Complex numbers, Modulus, Cube roots, Conversion of a number in Binary system to Decimals, and vice-versa.
- Arithmetic, Geometric and Harmonic progressions.
- Quadratic equations, Linear in-equations
- Permutation and Combination
- Binomial theorem and Logarithms.

CALCULUS

- Concept of a real-valued function, domain, range, and graph of a function.
- Composite functions, one-to-one, onto, and inverse functions.
- The notion of limit, Standard limits, Continuity of functions, algebraic operations on continuous functions.
- Derivative of function at a point, geometrical and physical interpretation of a derivative-application.
- Derivatives of sum, product, and quotient of functions, a derivative of a function concerning another function, the derivative of a composite function. Second-order derivatives.
- Increasing and decreasing functions. Application of derivatives in problems of maxima and minima

TRIGONOMETRY

- Angles and their measures in degrees and radians.
- Trigonometric ratios. Trigonometric identities Sum and difference formulae. Multiple and Sub-multiple angles.
- Applications-Height and distance, properties of triangles.

VECTOR ALGEBRA

- Vectors in two and three dimensions, magnitude, and direction of a vector.
- Unit and null vectors, the addition of vectors, scalar multiplication of a vector, scalar product, or dot product of two vectors. Vector product or cross product of two vectors.
- Applications—work done by a force and moment of a force and in geometrical problems.

ANALYTICAL GEOMETRY OF TWO AND THREE DIMENSION

- Rectangular Cartesian Coordinate system.
- Distance formula. Equation of a line in various forms.
- The angle between two lines.
- Distance of a point from a line.
- Equation of a circle in standard and a general form. Standard forms of parabola, ellipse, and hyperbola.
- Eccentricity and axis of a conic. Point in a three-dimensional space, the distance between two points.
- Direction Cosines and direction ratios. Equation two points.
- Direction Cosines and direction ratios.
- Equation of a plane and a line in various forms. The angle between two lines and the angle between two planes.
- Equation of a sphere.

STATISTICS AND PROBABILITY

- Probability: Random experiment, outcomes, and associated sample space, events, mutually exclusive and exhaustive events, impossible and certain events.
- Union and Intersection of events. Complementary, elementary, and composite events. Definition of probability-classical and statistical-examples.

SAINIK SCHOOL KALIKIRI

SUMMER VACATION HOLIDAY HOMEWORK – SLOW LEARNERS

CLASS XII-MATHEMATICS

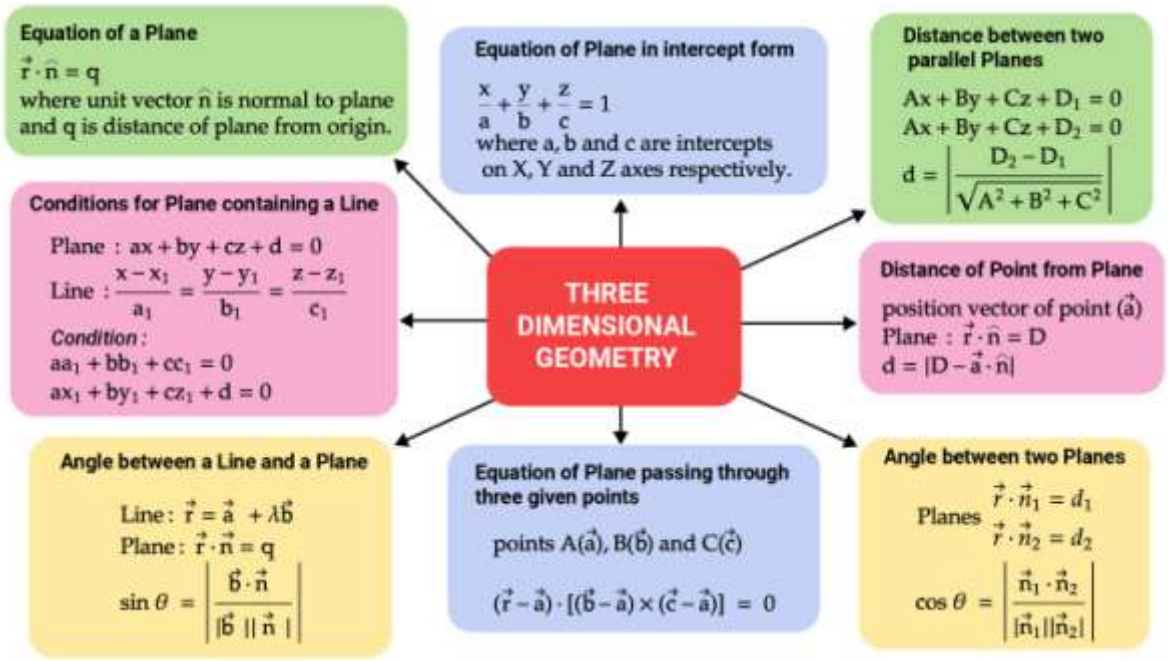
Solve the CBSE Board previous year questions and NCERT Exemplars of the following chapters. Solve chapter wise questions in a separate notebook and submit it after vacation. Also, make concept maps for these chapters.

1. Relations and Functions
2. Inverse Trigonometric Functions
3. Matrices
4. Determinants

https://ncert.nic.in/exemplar-problems.php?ln=en

Concept Maps

An example is illustrated for reference.



SAINIK SCHOOL KALIKIRI
HOLIDAY HOMEWORK
SUB : BIOLOGY
CLASS :XI

1. Prepare an album of flora and fauna of your locality
   Or
   Prepare a PPT on local plants along with their classification

2. Prepare an Investigatory project on any one topic of your choice.
   Ex: i Blood grouping
   ii.Disorders of Respiratory system

3. Complete the work sheet.

   (The Living World)
   General Instruction:
   All questions are compulsory.
   Question No.1 to 3 carry one marks each. Question No.4 to 6 carry two marks each.
   Question No.7 and 8 carry three marks each. Question No.9 carry five marks.
   1.Name the three fields of systematics.
   2.Give the two name system of organisms?
   3. Write the correct order of sequence of taxonomical categories?
   4.What are the advantages of giving scientific names of the organisms?
   5. Give the role of botanical gardens?
   6.Differentiate between species & taxon?
   7. Name the guidelines for naming of organisms?
   8.What is Biological classification? What is the need of classification?
   9. What is Binomial system of nomenclature? Who proposed this system? Why is binomial nomenclature the most acceptable mode of naming organism?

   (Biological Classification)
   General Instruction:
   All questions are compulsory.
   Question No. 1 to 3 carry one marks each. Question No. 4 to 6 carry two marks each.
   Question No. 7 and 8 carry three marks each. Question No. 9 carry five marks.
   1.Who introduced the five kingdom classification of organisms?
   2. To which kingdom the multicellular decomposers belong?
   3. Expand PPLO
   4. What is the basis of modern classification?
   5. Give one example of a fungus as a soure of antibiotics?
   6. How are viroids different from viruses?
   7. Explain sexual reproduction in bacteria?

8. Discuss the salient features of viruses with the help of diagram?
9. Write the distinct characters of fungi & explain using a diagram.

CLASS - XI BIOLOGY (Plant Kingdom)
General Instruction:
All questions are compulsory.
Question No. 1 to 3 carry one marks each. Question No. 4 to 6 carry two marks each.
Question No. 7 and 8 carry three marks each. Question No. 9 carry five marks.
1.Name the group of seedless vascular plants.
2. Which pigment is responsible for red colour of red algae?
3. Define a cone?
4. Comment on the features that led to the dominance of vascular plants?
5. Distinguish between Red algae & brown algae?
6. Enlist few salient features of dicot plants?
7. Briefly explain the structure of prothallus of a fern?
8. Point out differences between the mode of sexual reproduction of moss & fern?
9. Discuss the variouslife cycles of a green algae?

SAINIK SCHOOL KALIKIRI

CLASS-XI COMPUTER SCIENCE

HOLIDAY HOMEWORK

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1. Define Nibble and Byte?
2. What are software classifications? Discuss the functioning in brief?
3. Binary equivalent for $(75.625)_{10}$?
4. Expand and explain EEPROM, ISCII?
5. Explain Absorption law& Distributive law in Boolean algebra?
6. Explain DE Morgan's laws with proof?
7. Explain Mobile system organization?
8. What is a logical gate, explain how many logical gates we have in Boolean logic?
9. Convert a) $(867)_8$ to Binary
   b) $(FAB87)_{16}$ to Octal
   c) 100010100111 to Decimal
   d) $(78347)_{10}$ to Binary

10. Draw logical circuits for:
    a) AB+BC(B+C)
    b) AB'+A'B
    c) AB+(BC)'+BC
    d) B(A+C)'

NOTE: Revise Chapter 1,Chapter 2,Chapter 3 .

SAINIK SCHOOL KALIKIRI

CLASS-XI ENGLISH

HOLIDAY HOMEWORK

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1. PROJECT WORK TOPIC : PAIN OF OLD AGE (PPT WORK)

2. THE PORTRAIT OF A LADY (ABOUT THE AUTHOR, THEME, SUMMARY AND IMPORTANT WORDS AND THEIR MEANINGS)

3. A PHOTOGRAPH (ABOUT THE POET, THEME, SUMMARY AND IMPORTANT WORDS AND THEIR MEANINGS)

   Note: All PPT's should be submitted to respective subject teacher E-Mail Id.

SAINIK SCHOOL KALIKIRI
CLASS 11 – CHEMISTRY HOLIDAY HOMEWORK
2024-25

	Section A	
1	A solution is prepared by adding 2 g of a substance A to 18 g of water. Calculate the mass percent of the solute? a) 10.00 % b) 11.11% c) 0.50 % d) 1.01%	**[1]**
2	18.72 g of a substance X occupies 1.81 cm^3 . What will be its density measured in correct significant figures? a) 10.34 g/cm^3 b) 10.3 g/cm^3 c) 10.4 g/cm^3 d) 10.3425 g/cm^3	**[1]**
3	27°C in Kelvin is a) 227 K b) 246.15 K c) 300.15 K d) 127.15 K	**[1]**
4	5.6 litres of oxygen at NTP is equivalent to: a) $\frac{1}{4}$ mole b) $\frac{1}{8}$ mole c) $\frac{1}{2}$ mole d) 1 mole	**[1]**
5	The empirical formula and molecular mass of a compound are CH_2O and 180 g respectively. What will be the molecular formula of the compound? a) $C_6H_{12}O_6$ b) $C_2H_4O_2$ c) CH_2O d) $C_9H_{18}O_9$	**[1]**
6	20 °F can also be writtenin Kas a) 169.5 K b) 256.00 K c) 266.5 K d) 206.5 K	**[1]**
7	We have to prepare a Litre solution of 0.2 M NaOH from the available 1M solution. Whatvolume of 1M NaOH is required to be taken? a) 2 mL b) 200 mL c) 0.2 mL d) 20 mL	**[1]**
8	The molar mass of Al_2O_3 is: a) 102 u b) 92 u c) 42 u d) 82 u	**[1]**
9	One mole of any substance contains 6.022×10^{23} atoms/molecules. Number of molecules of H_2SO_4 present in the 100 mL of 0.02M H_2SO_4 solution is _____.	**[1]**

	a) 6.022×10^{23} molecules b) 12.044×10^{20} molecules c) 12.044×10^{23} molecules d) 1×10^{23} molecules	
10	The empirical formula of sucrose is a) CHO b) $C_{12}H_{22}O_{11}$ c) $C(H_2O)_2$ d) CH_2O	**[1]**
11	Which of the following statements indicates that law of multiple proportion is being followed. a) At constant temperature and pressure 200 mL of hydrogen will combine with 100 mL oxygen to produce 200 mL of water vapour. b) Carbon forms two oxides namely CO_2 and CO, where masses of oxygen which combine with fixed mass of carbon are in the simple ratio 2:1. c) When magnesium burns in oxygen, the amount of magnesium taken for the reaction is equal to the amount of magnesium in magnesium oxide formed. d) Sample of carbon dioxide taken from any source will always have carbon and oxygen in the simple ratio 1:2	**[1]**
12	Molecular mass is the a) maximum of atomic masses of the elements present in a molecule b) minimum of atomic masses of the elements present in a molecule c) average of atomic masses of the elements present in a molecule d) sum of atomic masses of the elements present in a molecule	**[1]**
13	**Assertion (A):** Sodium chloride, contains discrete molecules as their constituent units. **Reason (R):** In NaCl compounds, positive (sodium ion) and negative (chloride ion) entities are arranged in a three - dimensional structure. a) Both A and R are true and R is the correct explanation of A. b) Both A and R are true but R is not the correct explanation of A. c) A is true but R is false. d) A is false but R is true.	**[1]**
14	**Assertion (A):** 22.4 L of N_2 at NTP and 5.6 L O_2 at NTP contain equal number of molecules. **Reason (R):** Under similar conditions of temperature and pressure all gases contain equal number of molecules. a) Both A and R are true and R is the correct explanation of A. b) Both A and R are true but R is not the correct explanation of A. c) A is true but R is false. d) Both A and R are false.	**[1]**
15	**Assertion (A):** Atomic mass has no unit but is expressed in amu. **Reason (R):** It is the average mass of an atom taking care of the relative abundance of all its possible isotopes. a) Both A and R are true and R is the correct explanation of A. b) Both A and R are true but R is not the correct explanation of A. c) A is true but R is false. d) A is false but R is true.	**[1]**
16	**Assertion (A):** Both 44g CO_2 and 16g CH_4 have same number of carbon atoms. **Reason (R):** Both contain 1 g atom of carbon which contains 6.023×10^{23} carbon atoms. a) Both A and R are true and R is the correct explanation of A. b) Both A and R are true but R is not the correct explanation of A. c) A is true but R is false. d) A is false but R is true.	**[1]**
	Section - B	

17	Use the data given in the following table to calculate the molar mass of naturally occurring argon isotopes: **Isotope** | **Isotopic molar mass** | **Abundance** ^{36}Ar | 35.96755 g mol $^{-1}$ | 0.337% ^{36}Ar | 37.96272 g mol $^{-1}$ | 0.063% ^{40}Ar | 39.9624 g mol $^{-1}$ | 99.600%	**[2]**
18	Calculate the mass of sodium acetate (CH_3 COONa) required to make 500 mL of 0.375 molar aqueous solution. Molar mass of sodium acetate is 82.0245 g mol $^{-1}$.	**[2]**
19	How much copper can be obtained from 100 g of copper sulphate ($CuSO_4$)?	**[2]**
20	45.4 L of dinitrogen reacted with 22.7 L of dioxygen and 45.4 L of nitrous oxide was formed. The reaction is given below: $2N_2(g) + O_2(g) \rightarrow 2N_2O(g)$ Which law is being obeyed in this experiment? Write the statement of the law.	**[2]**
21	Two students performed the same experiment separately and each one of them recorded two readings of mass which are given below. Correct reading of mass is 3.0 g. On the basis of given data, what would you infer about the accuracy and precision in the readings of students A× B? **Students** | **Readings** (i) | (ii) A | 3.01 | 2.99 B | 3.05 | 2.95	**[2]**
	Section - C	
22	An alloy of iron (53.6%), nickel (45.8 %) and manganese (0.6 %) has a density of 8.17 g cm^{-3} . Calculate the number of Ni atoms present in the alloy of dimensions 10.0 cm × 20.0 cm × 15.0 cm	**[3]**
23	1. Assuming the density of water to be 1g/cm^3 , calculate the volume occupied by one molecule of water. 2. Assuming the water molecule to be spherical, calculate the diameter of the water molecule. 3. Assuming that oxygen atom occupies half of the volume occupied by the water molecule, calculate approximately the diameter of the oxygen atom.	**[3]**
24	(a) A sugar syrup of weight 214.2 g contains 34.2 g of sugar ($C_{12}H_{22}O_{11}$). Calculate 1. molal concentration, and 2. mole fraction of sugar in the syrup (b) Dinitrogen and dihydrogen react with each other to produce ammonia according to the following chemical equation: $N_2(g) + 3H_2(g) \rightarrow 2NH_3(g)$ 1. Calculate the mass of ammonia produced if 2.00× 10^3 g dinitrogen reacts with 1.00 × 10^3 gdihydrogen 2. Will any of the two reactants remain unreacted? 3. If yes, which one and what would be its mass?	**[3]**
25	The density of 3 M solution of NaCl is 1.25 g mL^{-1} . Calculate the molality of the solution.	**[3]**
26	Define the law of multiple proportions. Explain it with two examples. How does this law point to the existence of atoms?	**[3]**
27	A vessel contains 1.6 g of dioxygen at STP (273.15K, 1 atm pressure). The gas is now transferred to another vessel at constant temperature, where pressure becomes half of the original pressure. Calculate 1. volume of the new vessel. 2. number of molecules of dioxygen	**[3]**
28	Calculate the amount of water (g) produced by the combustion of 16 g of methane.	**[3]**
	Section - D	
29	**Read the text carefully and answer the questions:** The amount of substance present in volume can be expressed by Mass or weight per cent (w/w %), Mole fraction, Molarity,	**[4]**

	Molality. It is the ratio of a number of moles of a particular component to the total number of moles of the solution. Molality It is defined as the number of moles of solute present in 1 kg of solvent. M NaOH means 1 mol of NaOH present in 1 litre of the solution. For 0.2 M solution, we require 0.2 moles of NaOH dissolved in 1 litre solution. Hence, for making 0.2M solution from 1M solution, we have to take that volume of 1M NaOH solution, which contains 0.2 mol of NaOH and dilute the solution with water to 1 litre. one reactant is in more amount than the amount required by a balanced chemical reaction. The reactant which is present in the least amount gets consumed after some time and after that further reaction does not take place whatever be the amount of the other reactant. Hence, the reactant, which gets consumed first, limits the amount of product formed and is, therefore, called the limiting reagent. 1. What is the concentration of nitrate ions if equal volumes of 0.1M $AgNO_3$ and 0.1M NaCl are mixed together? 2. What is the normality of a 1M solution of H_3 PO $_4$? 3. Does 20 g NaOH in 200 mL of solution and 0.5 mol of KCl in 200 mL have the same concentration? 4. Write is the difference between molality and molarity.	
30	**Read the text carefully and answer the questions:** Atoms and molecules are extremely small in size and their numbers in even a small amount of any substance are really very large. To handle such large numbers, a unit of convenient magnitude is required. The idea of the mole is to count entities at the microscopic level (i.e., atoms, molecules, particles, electrons, ions, etc). In the SI system, mole (symbol, mol) was introduced as the seventh base quantity for the amount of a substance. The mole, symbol mol, is the SI unit of the amount of substance. One mole contains exactly 6.02214076×10^{23} elementary entities. This number is the fixed numerical value of the Avogadro constant, N_A , when expressed in the unit mol^{-1} and is called the Avogadro number. The amount of substance, symbol n, of a system is a measure of the number of specified elementary entities. An elementary entity may be an atom, a molecule, an ion, an electron, any other particle or specified group of particles. the empirical formula represents the simplest whole - number ratio of various atoms present in a compound, whereas, the molecular formula shows the exact number of different types of atoms present in a molecule of a compound. 1. What is the mass of one atom of S? 2. What is the percentage of carbon in ethanol? 3. Does 8.0g of methane contain same number of carbon atoms as are in 6.0g of carbon? 4. Calculate the number of moles and molecules of urea present in 5.6 g of Urea.	**[4]**
	Section - E	
31	50.0 kg of N_2 (g) and 10.0 kg of H_2 (g) are mixed to produce NH_3 (g). Calculate the amount of NH_3 (g) formed. Identify thelimiting reagent in the production of NH_3 in this situation.	**[5]**
32	(a) A solution is prepared by adding 2 g of a substance A to 18 g of water. Calculate the mass percent of the solute. Also define volume percentage and parts per million (ppm). (b) A welding fuel gas contains carbon and hydrogen only. Burning a small sample of it in oxygen gives 3.38 g carbon dioxide, 0.690 g of water and no other products. A volume of 10.0 L (measured at S.T.P) of this welding gas is found to weigh 11.6 g. Calculate 1. empirical formula, 2. molar mass of the gas, and 3. molecular formula.	**[5]**

33	(a) The following data were obtained when dinitrogen and dioxygen react together to form different compounds: 1. Which law of chemical combination is obeyed by the above experimental data? Give its statement. 2. Fill in the blanks in the following conversations: a. 1 km = _____ mm = _____ pm b. 1 mg =_____ kg =_____ ng c. 1 mL =_____ L =_____ dm^3 (b) 1. Give an example of a molecule in which a. The ratio of the molecular formula and the empirical formula is 6: 1. b. Molecular weight is two times of the empirical formula weight. c. The empirical formula is CH_2 Oand the ratio of molecular formula weight and empirical formula weight is 6. 2. 1.615 g of anhydrous $ZnSO_4$ was left in moist air. After a few days its weight was found to be 2.875 g. What is the molecular formula of hydrated salt? (At. masses: Zn= 65.5, S= 32, O=16, H= 1)	**[5]**

Mass of dinitrogen	Mass of dioxygen
14 g	16 g
14 g	32 g
28 g	32 g
28 g	80 g

CLASS XI SUMMER HOLIDAY HOMEWORK

(To be submitted on foolscape sheets by 19-06-2024)

TWO MARKS QUESTIONS:

1. Define average velocity and average acceleration. And its formulas

2. A body thrown vertically upwards. Draw its i) velocity time graph ii) acceleration time graph 3.Define instantaneous acceleration and its formula

4.What are positive and negative acceleration in a straight line motion?

5. Can a body have zero velocity and still be accelerating ? if yes give an example.

6.Give position time graph for one object moving with negative velocity, moving with positive velocity and at rest.

7. What is common between the two graphs shown in the fig.below

8.A body starts from point P and moves to Q. If the body returns to the same point(P),

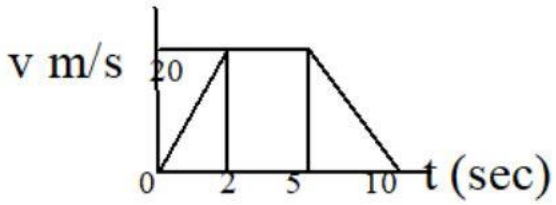
find i) displacement ii)distance iii) velocity iv) average speed

9. . On a 60 km straight road,a bus travels the first 30km with uniform speed of 30km/hr.How fast must the bus travel the next 30km so as to have average speed of 40km/hr for the entire trip

10. The acceleration of a particle is given by $a = 3t^2 + 2t + 2$,where time t is in second.If the particle starts with a velocity v = 2m/s at t = 0, then find the velocity at the end of 2s.

11. A body covers 200cm in the first 2 seconds and 220cm in next 2 seconds.What will be its velocity at the end of 7 seconds ? Also find the displacement in 7 seconds.

12. The velocity time graph of an object moving along a straight line is as shown



Calculate the distance covered by object between i) t = 0 to t = 5 sec. ii) t = 0 to t = 10 sec.

13. Under what condition ,the resultant of two vectors will be equal to either of them.

14.Why the magnitude of the rectangular component of a vector can`t be greater than the magnitude of vector itself.

15.A body is thrown with a velocity v from a tower of height H .After how much time and what distance from the base of the tower will the body strike the ground ?

16. Find the direction for an umbrella when rain falls vertically with a speed 20m/sand the wind blows from east to west with a speed of 15m/s

17. Two bodies are thrown with the same initial velocity at angle θ and $(90^0 - \theta)$to the horizontal.Determine the ratio of maximum heights reached by the bodies.

18. The sum of two forces acting at a point is 16N and their resultant force is 8N and its direction is perpendicular to a smaller force .Calculate the two forces.

THREE MARKS QUESTIONS

19.From a velocity time graph, Explain how do you calculate the average acceleration of a moving body

20. Draw the v-t graph for motions with constant acceleration.

a) Motion in positive direction with positive acceleration

b) Motion in negative direction with negative acceleration

c) Motion of an object with negative acceleration that changes direction. at time.

21. Define the following terms

i)Instantaneous acceleration ii)Average acceleration iii) Non uniform acceleration.

22.What do you understand by free fall? Draw the following graphs for an object under free fall

i) Variation of acceleration with respect to time

ii) variation of velocity with respect to time

iii) variation of distance with respect to time

23.Explain the concept of reaction time and suggest an activity to measure it.

24.What is stopping distance of vehicles?How will you use equations of motion to measure the same?

25. A ball is thrown vertically upwards with a velocity of 20 m s^{-1} from the top of a multistorey building. The height of the point from where the ball is thrown is 25.0 m from the ground. (a) How high will the ball rise ? and (b) how long will it be before the ball hits the ground? Take g = 10 m s^{-2}.

26. A car moving along a straight highway with speed of 126 km h^{-1} is brought to a stop within a distance of 200 m. What is the retardation of the car (assumed uniform), and how long does it take for the car to stop ?

27. Prove that maximum horizontal range is four times the maximum height attained by the projectile.

28. Find the resultant vector of the summation of two vectors A and B having θ between them.

29. A projectile is fired at an angle θ with the horizontal with velocity v .Derive the expression for maximum height attained by it.

30. If the time of flight of a projectile projected with velocity u at an angle θ is (2u sin θ) / g , write the condition for maximum range and find its expression.

31. The position of a particle is given by

$$\mathbf{r} = 3.0t\,\hat{\mathbf{i}} + 2.0t^2\hat{\mathbf{j}} + 5.0\hat{\mathbf{k}}$$

where t is in seconds and the coefficients have the proper units for r to be in metres. (a) Find v(t) and a(t) of the particle. (b) Find the magnitude and direction of v(t) at t = 1.0 s.

32. A particle starts from origin at t = 0 with a velocity 5.0 î m/s and moves in x-y plane under action of a force which produces a constant acceleration of $(3.0\hat{\mathbf{i}} + 2.0\hat{\mathbf{j}})\ \mathrm{m/s^2}$.

(a) What is the y-coordinate of the particle at the instant its x-coordinate is 84 m ? (b) What is the speed of the particle at this time ?

33. A hiker stands on the edge of a cliff 490 m above the ground and throws a stone horizontally with an initial speed of 15 m s^{-1}. Neglecting air resistance, find the time taken by the stone to reach the ground, and the speed with which it hits the ground. (Take g = 9.8 m s^{-2}).

34. A cricket ball is thrown at a speed of 28 m s^{-1} in a direction 30° above the horizontal. Calculate (a) the maximum height, (b) the time taken by the ball to return to the same level, and (c) the distance from the thrower to the point where the ball returns to the same level.

35. State with reasons, whether the following algebraic operations with scalar and vector physical quantities are meaningful :

(a) adding any two scalars, (b) adding a scalar to a vector of the same dimensions ,

(c) multiplying any vector by any scalar, (d) multiplying any two scalars, (e) adding any two vectors, (f) adding a component of a vector to the same vector.

36. Read each statement below carefully and state with reasons, if it is true or false :

(a) The magnitude of a vector is always a scalar,

(b) each component of a vector is always a scalar,

(c) the total path length is always equal to the magnitude of the displacement vector of a particle.

(d) the average speed of a particle (defined as total path length divided by the time taken to cover the path) is either greater or equal to the magnitude of average velocity of the particle over the same interval of time,

(e)Three vectors not lying in a plane can never add up to give a null vector.

37. On an open ground, a motorist follows a track that turns to his left by an angle of 600 after every 500 m. Starting from a given turn, specify the displacement of the motorist at the third, sixth and eighth turn. Compare the magnitude of the displacement with the total path length covered by the motorist in each case.

FIVE MARKS QUESTIONS

38.Using the v-t graph obtain the three equations of motion for a uniformly accelerated motion.

39.State parallelogram law of vector addition,Hence find the magnitude and directions of resultant of two vectors forming two adjacent sides of a parallelogram.

40.What is projectile motion?Give two examples observed in daily life.

Show that trajectory of a projectile is parabolic in nature.

41.For a body in horizontal projectile motion obtain expressions for (a) Time of flight (b) maximum height attained and (c) horizontal range.When is maximum horizontail range attained.

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NCC Holiday Homework Instructions

To make the most of your NCC holiday homework, we've streamlined the process for you. Follow these steps to ensure you complete your tasks effectively:

Download the DGNCC Training App(i.e. https://play.google.com/store/apps/details?id=com.chl.ncc): Head over to the Google Play Store and install the DGNCC Training App on your device. This app is your gateway to accessing essential NCC training materials.

Navigate to "Presis": Once the app is installed, open it and click on the "Presis" section. Here, you'll find a range of resources tailored to your NCC training needs.

Access Junior Cadets Content: Within "Presis," locate the section dedicated to Junior Cadets. This is where you'll find content specifically designed for cadets like you.

Download "Common Subjects": Under the Junior Cadets section, look for the option to download "Common Subjects." This contains valuable material pertinent to your NCC training.

Explore Official NCC SD Common Subject Content: Once downloaded, delve into the official release of NCC SD Common Subject content. This material is curated to enrich your understanding of essential subjects.

Read and Summarize: Your task is to thoroughly read the common subject content. Choose any 15 chapters that pique your interest, and submit important headings from each chapter.

Remember, this holiday homework is not just about completing tasks but also about deepening your knowledge and understanding of NCC principles. Should you have any questions or encounter any difficulties, don't hesitate to reach out for assistance. (+91 7981070167 ANO S/O Jagdish Babu)

Best wishes for a productive holiday period!

Dept of NCC, Sainik School Kalikiri

SAINIK SCHOOL KALIKIRI

AY 2024-25

SUMMER VACATION HOLIDAY HOMEWORK - NDA

CLASS XI-MATHEMATICS

1. Write the following ten lab activities procedure in the lab record and submit it after vacation. Observations are to be left blank and same to be recorded at the time of performing lab activities. Lab activity record carries 5 marks in the internal assessment.

a) Subsets

b) Relation and Function

c) Sine and Cosine Functions

d) Graphs of Trigonometric Functions

e) Geometrical Meaning of Complex Numbers

f) Permutation and Combination

g) Conic Sections (Make models and bring)

h) Parabola

i) 3-D

j) Derivatives

2. Solve the problems from NCERT Exemplars of the following chapters in the class work for PT-1 exam.

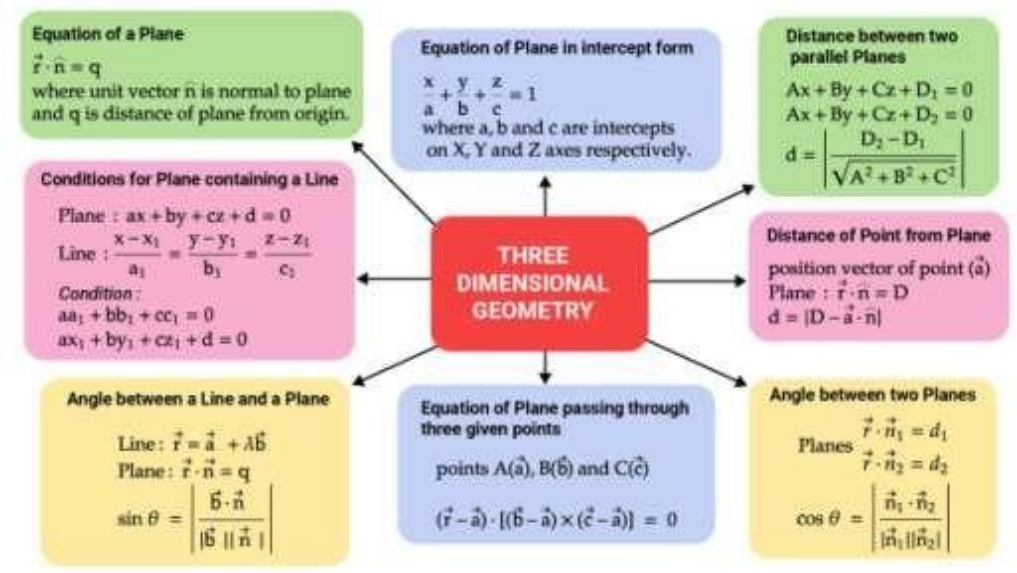
a) Sets

b) Relations and Functions

c) Linear Inequalities

https://ncert.nic.in/exemplar-problems.php?ln=en

3. Concept Maps: Make concept maps for the above three chapters.An example is illustrated for reference.



Activity 1

Objective

To find the number of subsets of a given set and verify that if a set has n number of elements, then the total number of subsets is 2^n.

Material Required

Paper, different coloured pencils.

Method of Construction

1. Take the empty set (say) A_0 which has no element.
2. Take a set (say) A_1 which has one element (say) a_1.
3. Take a set (say) A_2 which has two elements (say) a_1 and a_2.
4. Take a set (say) A_3 which has three elements (say) a_1, a_2 and a_3.

Demonstration

1. Represent A_0 as in Fig. 1.1

   Here the possible subsets of A_0 is A_0 itself only, represented symbolically by ϕ. The number of subsets of A_0 is $1 = 2^0$

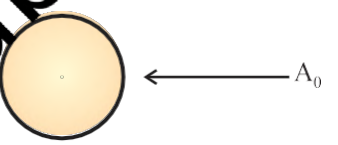


Fig. 1.1

2. Represent A_1 as in Fig. 1.2. Here the subsets of A_1 are ϕ, $\{a_1\}$. The number of subsets of A_1 is $2 = 2^1$

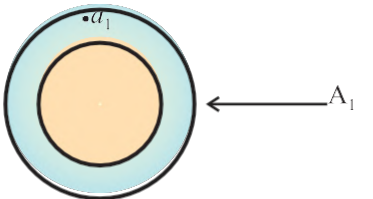


Fig. 1.2

3. Represent A_2 as in Fig. 1.3

   Here the subsets of A_2 are ϕ, $\{a_1\}$, $\{a_2\}$, $\{a_1, a_2\}$. The number of subsets of A_2 is $4 = 2^2$.

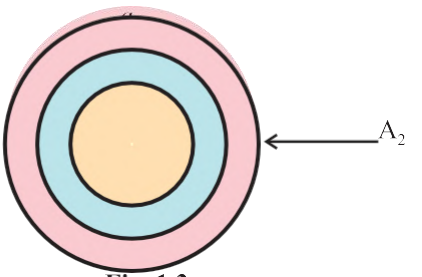


Fig. 1.3

4. Represent A_3 as in Fig. 1.4

   Here the subsets of A_3 are ϕ, $\{a_1\}$, $\{a_2\}$, $\{a_3\}$,$\{a_1, a_2\}$, $\{a_2, a_3\}$,$\{a_3, a_1\}$ and $\{a_1, a_2, a_3\}$. The number of subsets of A_3 is $8 = 2^3$.

5. Continuing this way, the number of subsets of set A containing n elements $a_1, a_2, ..., a_n$ is 2^n.

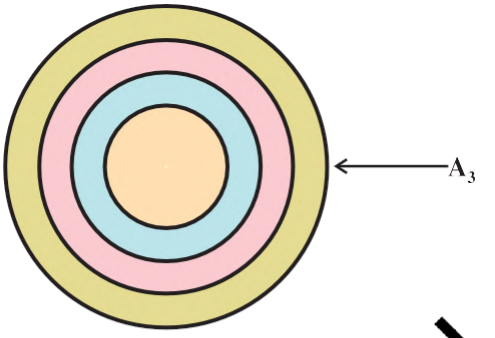


Fig. 1.4

OBSERVATION

1. The number of subsets of A_0 is _____ = 2
2. The number of subsets of A_1 is _____ = 2
3. The number of subsets of A_2 is _____ = 2
4. The number of subsets of A_3 is _____ = 2
5. The number of subsets of A_{10} is = 2
6. The number of subsets of A_n is = 2

APPLICATION

The activity can be used for calculating the number of subsets of a given set.

Activity 6

OBJECTIVE

To distinguish between a Relation and a Function.

MATERIAL REQUIRED

Drawing board, coloured drawing sheets, scissors, adhesive, strings, nails etc.

METHOD OF CONSTRUCTION

1. Take a drawing board/a piece of plywood of convenient size and paste a coloured sheet on it.
2. Take a white drawing sheet and cut out a rectangular strip of size 6 cm × 4 cm and paste it on the left side of the drawing board (see Fig. 6.1).

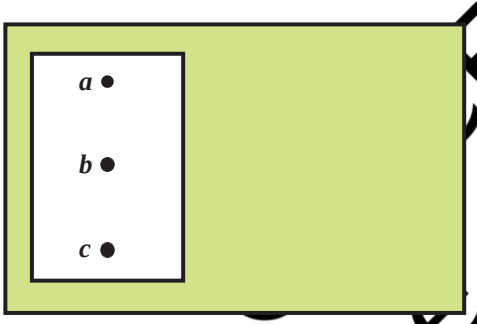


Fig. 6.1

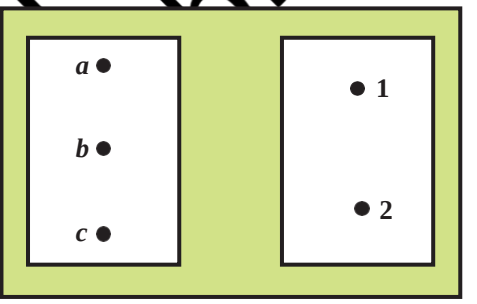


Fig. 6.2

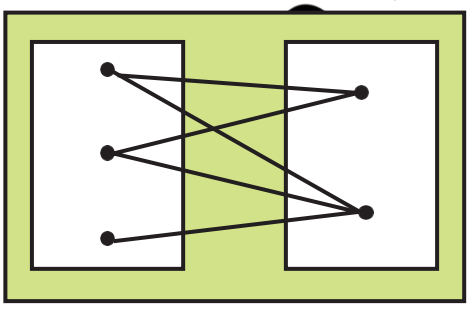


Fig. 6.3

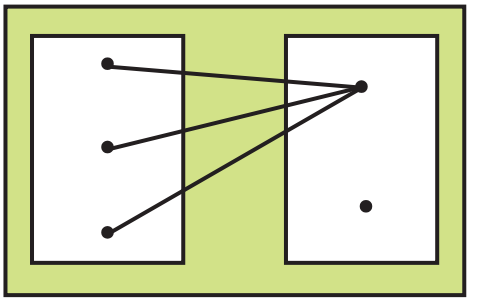


Fig. 6.4

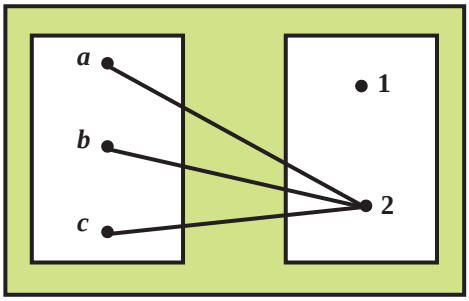


Fig. 6.5

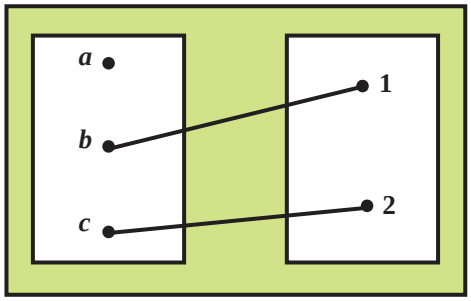


Fig. 6.6

3. Fix three nails on this strip and mark them as *a, b, c* (see Fig. 6.1).
4. Cut out another white rectangular strip of size 6 cm × 4 cm and paste it on the right hand side of the drawing board.
5. Fix two nails on the right side of this strip (see Fig. 6.2) and mark them as 1 and 2.

Demonstration

1. Join nails of the left hand strip to the nails on the right hand strip by strings in different ways. Some of such ways are shown in Fig. 6.3 to Fig. 6.6.
2. Joining nails in each figure constitute different ordered pairs representing elements of a relation.

Observation

1. In Fig. 6.3, ordered pairs are_____.

   These ordered pairs constitute a_____but not a_____.
2. In Fig. 6.4, ordered pairs are_____. These constitute a_____as well as_____.
3. In Fig. 6.5, ordered pairs are _____. These ordered pairs constitute a _____ as well as_____.
4. In Fig. 6.6, ordered pairs are_____. These ordered pairs do not represent _____ but represent _____ _.

Activity 8

Objective

To find the values of sine and cosine functions in second, third and fourth quadrants using their given values in first quadrant.

Material Required

Cardboard, white chart paper, ruler, coloured pens, adhesive, steel wires and needle.

Method of Construction

1. Take a cardboard of convenient size and paste a white chart paper on it.
2. Draw a unit circle with centre O on chart paper.
3. Through the centre of the circle, draw two perpendicular lines X′OX and YOY′ representing *x*-axis and *y*-axis, respectively, as shown in Fig.8.1.

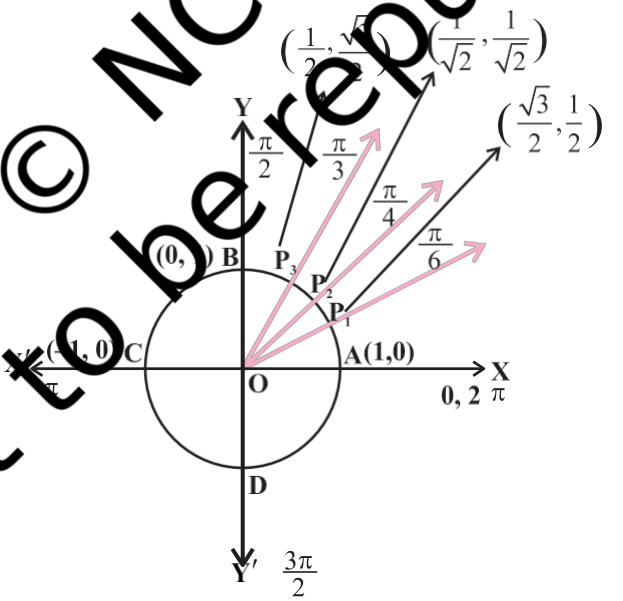


Fig. 8.1

4. Mark the points as A, B, C and D, where the circle cuts the *x*-axis and *y*-axis, respectively, as shown in Fig. 8.1.

5. Through O, draw angles P_1OX, P_2OX, and P_3OX of measures $\frac{\pi}{6}, \frac{\pi}{4}$ and $\frac{\pi}{3}$, respectively.

6. Take a needle of unit length. Fix one end of it at the centre of the circle and the other end to move freely along the circle.

DEMONSTRATION

1. The coordinates of the point P_1 are $\left(\frac{\sqrt{3}}{2}, \frac{1}{2}\right)$ because its *x*-coordinate is $\cos\frac{\pi}{6}$ and *y*-coordinate is $\sin\frac{\pi}{6}$. The coordinates of the points P_2 and P_3 are $\left(\frac{1}{\sqrt{2}}, \frac{1}{\sqrt{2}}\right)$ and $\left(\frac{1}{2}, \frac{\sqrt{3}}{2}\right)$, respectively.

2. To find the value of sine or cosine of some angle in the second quadrant (say) $\frac{2\pi}{3}$, rotate the needle in anti clockwise direction making an angle P_4OX of measure $\frac{2\pi}{3} = 120^\circ$ with the positive direction of *x*-axis.

3. Look at the position OP_4 of the needle in

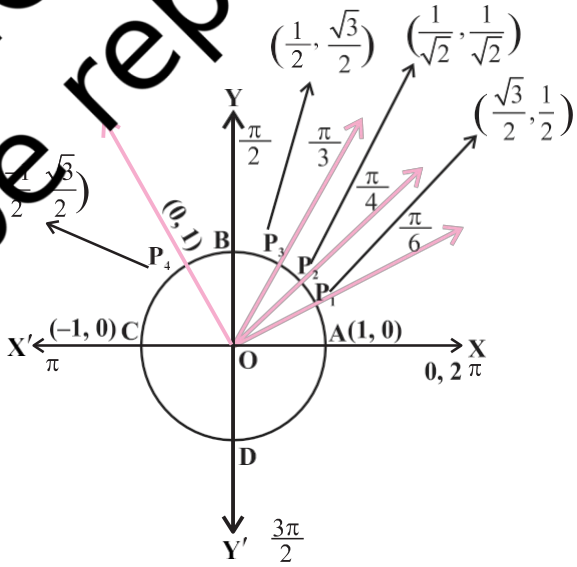


Fig. 8.2

Fig.8.2. Since $\frac{2\pi}{3} = \pi - \frac{\pi}{3}$, OP_4 is the mirror image of OP_3 with respect to y-axis. Therefore, the coordinate of P_4 are $\left(-\frac{1}{2}, \frac{\sqrt{3}}{2}\right)$. Thus $\sin \frac{2\pi}{3} = \frac{\sqrt{3}}{2}$ and $\cos \frac{2\pi}{3} = -\frac{1}{2}$.

4. To find the value of sine or cosine of some angle say, $\pi + \frac{\pi}{3} = \frac{4\pi}{3}$, i.e., $-\frac{2\pi}{3}$ (say) in the third quadrant, rotate the needle in anti clockwise direction making as an angle of $\frac{4\pi}{3}$ with the positive direction of x-axis.

5. Look at the new position OP_5 of the needle, which is shown in Fig. 8.3. Point P_5 is the mirror image of the point P_4 (since $\angle P_4OX' = \angle P_5OX'$) with respect to x-axis. Therefore, co-ordinates of P_5 are $\left(-\frac{1}{2}, -\frac{\sqrt{3}}{2}\right)$ and hence

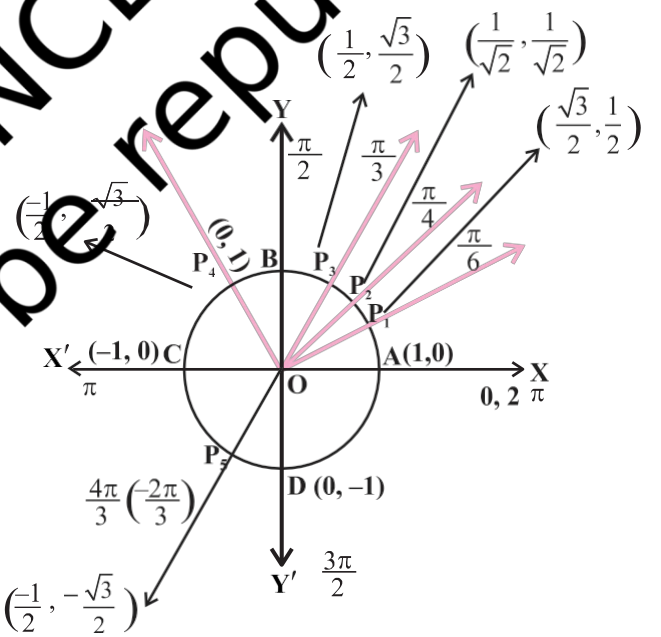


Fig. 8.3

$$\sin\left(-\frac{2\pi}{3}\right) = \sin\frac{4\pi}{3} = -\frac{\sqrt{3}}{2} \text{ and } \cos\left(-\frac{2\pi}{3}\right) = \cos\frac{4\pi}{3} = -\frac{1}{2}.$$

6. To find the value of sine or cosine of some angle in the fourth quadrant, say $\frac{7\pi}{4}$, rotate the needle in anti clockwise direction making an angle of $\frac{7\pi}{4}$ with the positive direction of *x*-axis represented by OP_6, as shown in Fig. 8.4. Angle $\frac{7\pi}{4}$ in anti clockwise direction = Angle $-\frac{\pi}{4}$ in the clockwise direction.

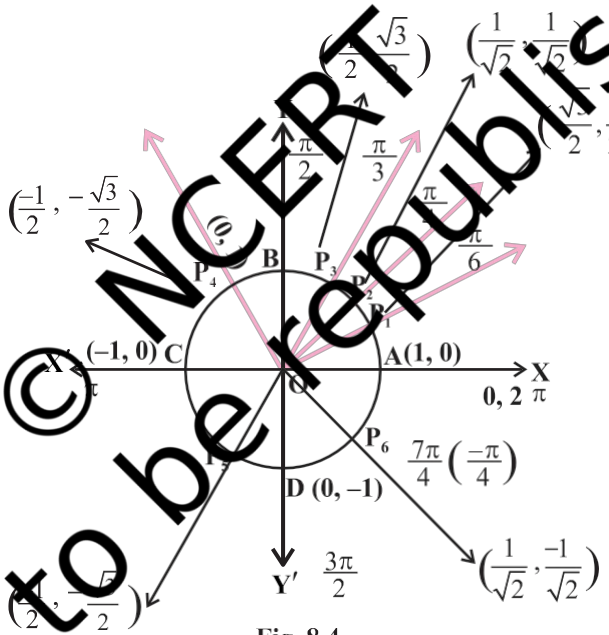


Fig. 8.4

From Fig. 8.4, P_6 is the mirror image of P_2 with respect to *x*-axis. Therefore, coordinates of P_6 are $\left(\frac{1}{\sqrt{2}}, -\frac{1}{\sqrt{2}}\right)$.

Thus $\sin\frac{7\pi}{4} = \sin\left(-\frac{\pi}{4}\right) = -\frac{1}{\sqrt{2}}$

and $\cos\frac{7\pi}{4} = \cos\left(-\frac{\pi}{4}\right) = \frac{1}{\sqrt{2}}$

8. To find the value of sine or cosine of some angle, which is greater than one revolution, say $\frac{13\pi}{6}$, rotate the needle in anti clockwise direction since $\frac{13\pi}{6} = 2\pi + \frac{\pi}{6}$, the needle will reach at the position OP . Therefore, $\sin\frac{13\pi}{6} = \sin\frac{\pi}{6} = \frac{1}{2}$ and $\cos\frac{13\pi}{6} = \cos\frac{\pi}{6} = \frac{\sqrt{3}}{2}$.

Observation

1. Angle made by the needle in one complete revolution is_____.
2. $\cos\frac{\pi}{6} =$ _____ $= \cos\left(-\frac{\pi}{6}\right)$

   $\sin\frac{\pi}{6} =$ _____ $= \sin(2\pi +$ _____$)$.
3. sine function is non-negative in _____and_____quadrants.
4. cosine function is non-negative in_____and_____quadrants.

Application

1. The activity can be used to get the values for tan, cot, sec, and cosec functions also.
2. From this activity students may learn that
   $\sin(-\theta) = -\sin\theta$ and $\cos(-\theta) = \cos\theta$

   This activity can be applied to other trigonometric functions also.

Activity 10

OBJECTIVE

To plot the graphs of sin x, sin $2x$, $2\sin x$ and $\sin\frac{x}{2}$, using same coordinate axes.

MATERIAL REQUIRED

Plyboard, squared paper, adhesive, ruler, coloured pens, eraser.

METHOD OF CONSTRUCTION

1. Take a plywood of size 30 cm × 30 cm.
2. On the plywood, paste a thick graph paper of size 25 cm × 25 cm.
3. Draw two mutually perpendicular lines on the squared paper, and take them as coordinate axes.
4. Graduate the two axes as shown in the Fig. 10.
5. Prepare the table of ordered pairs for sin x, sin $2x$, $2\sin x$ and $\sin\frac{x}{2}$ for different values of x shown in the table below:

T. ratios	**0°**	$\frac{\pi}{12}$	$\frac{\pi}{6}$	$\frac{\pi}{4}$	$\frac{\pi}{3}$	$\frac{5\pi}{12}$	$\frac{\pi}{2}$	$\frac{7\pi}{12}$	$\frac{2\pi}{3}$	$\frac{9\pi}{12}$	$\frac{5\pi}{6}$	$\frac{11\pi}{12}$	π
sin x	0	0.26	0.50	0.71	0.86	0.97	1.00	0.97	0.86	0.71	0.50	0.26	0
sin $2x$	0	0.50	0.86	1.00	0.86	0.50	0	–0.5	–0.86	–1.0	–0.86	–0.50	0
2 sin x	0	0.52	1.00	1.42	1.72	1.94	2.00	1.94	1.72	1.42	1.00	0.52	0
$\sin\frac{x}{2}$	0	0.13	0.26	0.38	0.50	0.61	0.71	0.79	0.86	0.92	0.97	0.99	1.00

Demonstration

1. Plot the ordered pair (x, sin x), (x, sin $2x$), (x, sin $\frac{x}{2}$) and (x, 2sin x) on the same axes of coordinates, and join the plotted ordered pairs by free hand curves in different colours as shown in the Fig.10.

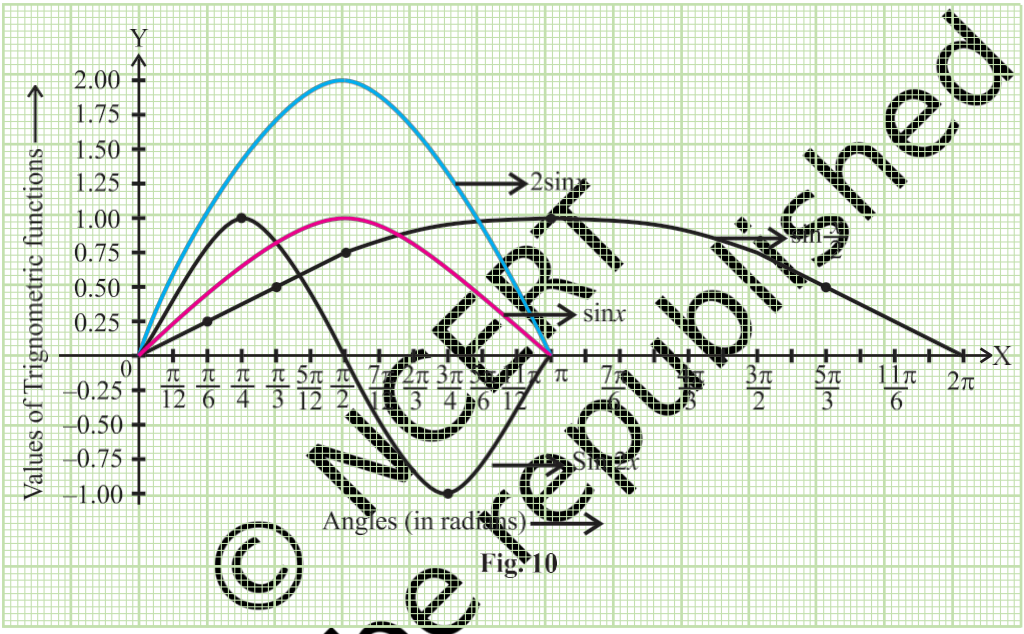


Fig. 10

Observation

1. Graphs of sin x and 2 sin x are of same shape but the maximum height of the graph of sin x is _____ the maximum height of the graph of _____.
2. The maximum height of the graph of sin $2x$ is _____. It is at x = _____.
3. The maximum height of the graph of 2 sin x is _____. It is at x = _____ .

4. The maximum height of the graph of $\sin \frac{x}{2}$ is _____ . It is at $\frac{x}{2}$ =_____.

5. At x =_____, $\sin x = 0$, at x =_____, $\sin 2x = 0$ and at x =_____, $\sin \frac{x}{2} = 0$.

6. In the interval $[0, \pi]$, graphs of $\sin x$, $2 \sin x$ and $\sin \frac{x}{2}$ are_____ x-axes and some portion of the graph of $\sin 2x$ lies_____ x-axes.

7. Graphs of $\sin x$ and $\sin 2x$ intersect at x =_____ in the interval $(0, \pi)$

8. Graphs of $\sin x$ and $\sin \frac{x}{2}$ intersect at x =_____ in the interval $(0, \pi)$.

APPLICATION

This activity may be used in comparing graphs of a trigonometric function of multiples and submultiples of angles.

Activity 11

Objective

To inerpret geometrically the meaning of $i=\sqrt{-1}$ and its integral powers.

Material Required

Cardboard, chart paper, sketch pen, ruler, compasses, adhesive, nails, thread.

Method of Construction

1. Paste a chart paper on the cardboard of a convenient size.
2. Draw two mutually perpendicular lines X′X and Y′Y interesting at the point O (see Fig. 11).
3. Take a thread of a unit length representing the number 1 along OX . Fix one end of the thread to the nail at 0 and the other end at A as shown in the figure.
4. Set free the other end of the thread at A and rotate the thread through angles of 90º, 180º, 270º and 360º and mark the free end of the thread in different cases as A_1, A_2, A_3 and A_4 respectively, as shown in the figure.

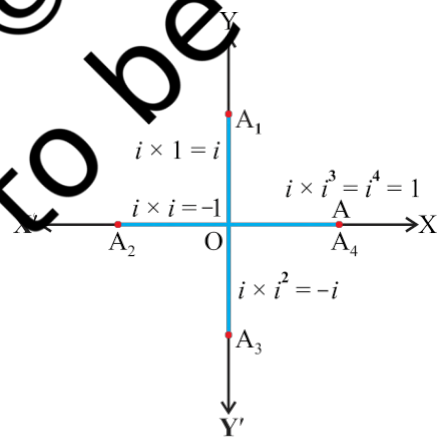


Fig. 11

Demonstration

1. In the argand plane, OA, OA_1, OA_2, OA_3, OA_4 represent, respectively, 1, i, –1, – i, 1.

2. $OA_1 = i = 1 \times i$, $OA_2 = -1 = i \times i = i^2$, $OA_3 = -i = i \times i \times i = i^3$ and so on. Each time, rotation of OA by 90º is equivalent to multiplication by i. Thus, i is referred to as the multiplying factor for a rotation of 90º.

Observation

1. On rotating OA through 90º, $OA_1 = 1 \times i =$ _____.
2. On rotating OA through an angle of 180°, $OA_2 = 1 \times$ ___ × ___ = _____.
3. On rotation of OA through 270º (3 right angles), $OA_3 =$ 1 × _____ × _____ × _____ = _____.
4. On rotating OA through 360º (4 right angles),

   $OA_4 = 1 \times$ _____ × _____ × _____ × _____ = _____.
5. On rotating OA through n right angles

   $OA_n = 1 \times$ _____ × _____ × _____ × _____ × ... n times = _____.

Application

This activity may be used to evaluate any integral power of i.

Activity 14

Objective

To find the number of ways in which three cards can be selected from given five cards.

Material Required

Cardboard sheet, white paper sheets, sketch pen, cutter.

Method of Construction

1. Take a cardboard sheet and paste white paper on it.
2. Cut out 5 identical cards of convenient size from the cardboard.
3. Mark these cards as C_1, C_2, C_3, C_4 and C_5.

Demonstration

1. Select one card from the given five cards.
2. Let the first selected card be C_1. Then other two cards from the remaining four cards can be : C_2C_3, C_2C_4, C_2C_5, C_3C_4, C_3C_5 and C_4C_5.Thus, the possible selections are : $C_1C_2C_3$, $C_1C_2C_4$, $C_1C_2C_5$, $C_1C_3C_4$, $C_1C_3C_5$, $C_1C_4C_5$. Record these on a paper sheet.
3. Let the first selected card be C_2. Then the other two cards from the remaining 4 cards can be : C_1C_3, C_1C_4, C_1C_5, C_3C_4, C_3C_5, C_4C_5.Thus, the possible selections are: $C_2C_1C_3$, $C_2C_1C_4$, $C_2C_1C_5$,$C_2C_3C_4$, $C_2C_3C_5$, $C_2C_4C_5$. Record these on the same paper sheet.
4. Let the first selected card be C_3. Then the other two cards can be : C_1C_2, C_1C_4, C_1C_5, C_2C_4, C_2C_5, C_4C_5.Thus, the possible selections are : $C_3C_1C_2$, $C_3C_1C_4$, $C_3C_1C_5$,$C_3C_2C_4$, $C_3C_2C_5$, $C_3C_4C_5$. Record them on the same paper sheet.
5. Let the first selected card be C_4. Then the other two cards can be : C_1C_2, C_1C_3, C_2C_3, C_1C_5, C_2C_5, C_3C_5 Thus, the possible selections are: $C_4C_1C_2$, $C_4C_1C_3$,$C_4C_2C_3$, $C_4C_1C_5$, $C_4C_2C_5$, $C_4C_3C_5$. Record these on the same paper sheet.

6. Let the first selected card be C_5. Then the other two cards can be: C_1C_2, C_1C_3, C_1C_4, C_2C_3, C_2C_4, C_3C_4 Thus, the possible selections are: $C_5C_1C_2$,$C_5C_1C_3$, $C_5C_1C_4$, $C_5C_2C_3$, $C_5C_2C_4$, $C_5C_3C_4$. Record these on the same paper sheet.
7. Now look at the paper sheet on which the possible selectios are listed. Here, there are in all 30 possible selections and each of the selection is repeated thrice. Therefore, the number of distinct selection $= 30 \div 3 = 10$ which is same as $5C_3$.

OBSERVATION

1. $C_1C_2C_3$, $C_2C_1C_3$ and $C_3C_1C_2$ represent the_____selection.
2. $C_1C_2C_4$, _____, _____ represent the same selection.
3. Among $C_2C_1C_5$, $C_1C_2C_5$, $C_1C_2C_3$,_____and_____represent the same selection.
4. $C_2C_1C_5$, $C_1C_2C_3$, represent_____selections.
5. Among $C_3C_1C_5$, $C_1C_4C_3$, $C_5C_3C_4$, $C_4C_2C_5$, $C_2C_4C_1$, $C_1C_3C_5$

   $C_3C_1C_5$,_____represent the same selections.

   $C_3C_1C_5$, $C_1C_4C_3$,_____,_____, represent different selections.

APPLICATION

Activities of this type can be used in understanding the general formula for finding the number of possible selections when r objects are selected from given n distinct objects, i.e., ${}^{n}C_{r} = \frac{n!}{r!(n-r)!}$.

Activity 21

Objective

To construct different types of conic sections.

Material Required

Transparent sheet, scissors, hard-board, adhesive, white paper.

Method of Construction

1. Take a hardboard of convenient size and paste a white paper on it.
2. Cut a transparent sheet in the shape of sector of a circle and fold it to obtain a right circular cone as shown in Fig.21.1.
3. Form 4 more such cones of the same size using transparent sheet. Put these cones on a hardboard.
4. Cut these cones with a transparent plane sheet in different positions as shown in Fig. 21.2 to Fig. 21.5.

Fig 21.1

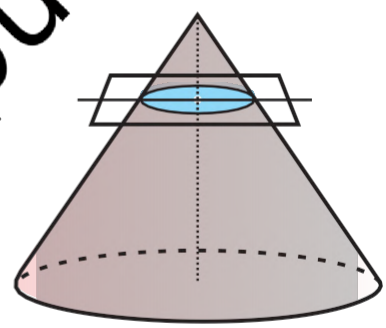


Fig 21.2

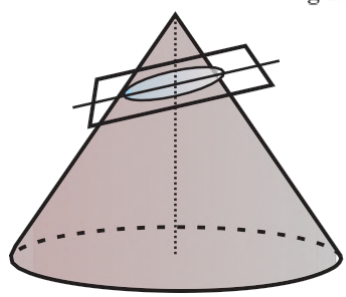


Fig 21.3

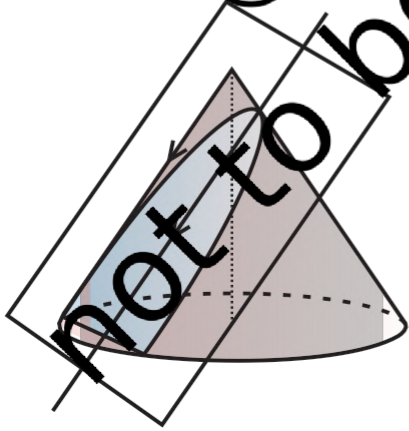


Fig 21.4

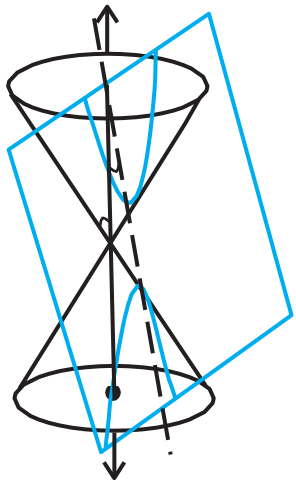


Fig 21.5

Demonstration

1. In Fig. 21.2, the transparent plane sheet cuts the cone in such a way that the sheet is parallel to the base of the cone. The section so obtained is a circle.
2. In Fig. 21.3, the plane sheet is inclined slightly to the axes of the cone. The section so obtained is an ellipse.
3. In Fig. 21.4, the plane sheet is parallel to a generator (slant height) of the cone. The section so obtained is a parabola.
4. In Fig. 21.5 the plane is parallel to the axis of the cone. The sections so obtained is a part of a hyperbola.

Observation

1. In Fig. 21.2, the transparent plane sheet is_____to the base of the cone. The section obtained is_____.
2. In Fig. 21.3, the plane sheet is inclined to _____. The conic section obtained is_____ _.
3. In Fig. 21.4, the plane sheet is parallel to the .....The conic section so obtained is_____.
4. In Fig. 21.5, the plane sheet is_____to the axis. The conic section so obtained is a part of_____.

Application

This activity helps in understanding various types of conic sections which have wide spread applications in real life situations and modern sciences. For example, conics have interesting geometric properties that can be used for the reflection of light rays and beams of sound, i.e.

1. Circular disc reflects back the light issuing from centre to the centre again.
2. Elliptical disc reflects back the light issuing from one focus to the other focus.
3. Parabolic disc reflects back the light issuing from one focus parallel to its axis.
4. Hyperbolic disc reflects back the light issuing from one focus as if coming from other focus.

Activity 22

Objective

To construct a parabola.

Material Required

Cardboard, white paper, sketch pen, pencil, compass, ruler etc.

Method of Construction

1. Take a cardboard of a convenient size and paste a white paper on it.
2. Mark a point S on the white paper on the board (see Fig. 22).
3. Through S draw a line. Draw another line l perpendicular to the line through S at some distance k units to the left of S.

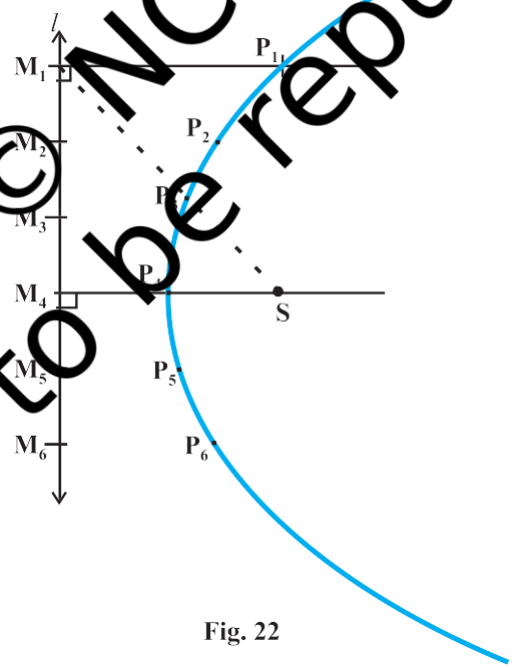


Fig. 22

4. Take any point M_1 on the line *l*. Draw the perpendicular to *l* at this point.
5. Join M_1S and draw perpendicular bisector of M_1S meeting the perpendicular through M_1 at the point P_1.
6. Take another point M_2 on the line *l* and repeat the process as explained in (5) above to obtain the point P_2.
7. Take some more points M_3, M_4, M_5, ... on the line *l* and repeat the above process to obtain points P_3, P_4, P_5, ..., respectively.
8. Draw a free hand curve through the points P_1, P_2, P_3, P_4, ...(see Fig. 22)

DEMONSTRATION

The points P_1, P_2, P_3,.....are such that the distance of each point from the fixed point S is same as the distance of the point from the line *l*. So, the free hand curve drawn through these points is a parabola with focus S and directrix *l*.

OBSERVATION

1. P_1M_1 = _____ P_1S = _____
2. P_2M_2 = _____ P_2S = _____
3. P_3M_3 = _____ P_3S = _____
4. P_4M_4 = _____ P_4S = _____
5. P_5M_5 = _____ P_5S = _____
6. The distance of the point P_1 from M_1 = The distance of P_1 from_____.
7. The distance between the points P_2 and M_2 = The distance of P_2 from _____.

   The distance of the point_____from M_3 = The distance of the point P_3 from_____.
8. Distances of the points P_1, P_2, P_3 ..... from the line *l* are_____to the distances of these points from the point S.
9. Therefore, the free hand curve obtained by joining P_1, P_2, P_3,.... is a _____ with directrix_____and focus_____.

10. Distance of the vertex P_4 and S =_____.

11. Distance of the vertex of parabola from the directrix =_____.

APPLICATION

1. This activity is useful in understanding the terms related to parabola, like directrix, focus, property of the point on the parabola.
2. Parabolas have applications in Science and Engineering.

Activity 27

Objective

To explain the concept of octants by three mutually perpendicular planes in space.

Material Required

A piece of plywood, saw, wires, rulers wooden-board, coloured papers, scissors, cutter, thin sheet of wood, wires.

Method of Construction

1. Cut out three square sheets each of size 30 cm × 30 cm from a piece of plywood and paste chart paper of different colours on both sides of sheets.
2. Fix two sheets in such a way that they intersect orthogonally in the middle of each other (see Fig. 27)
3. Cut the third sheet into two equal rectangles.

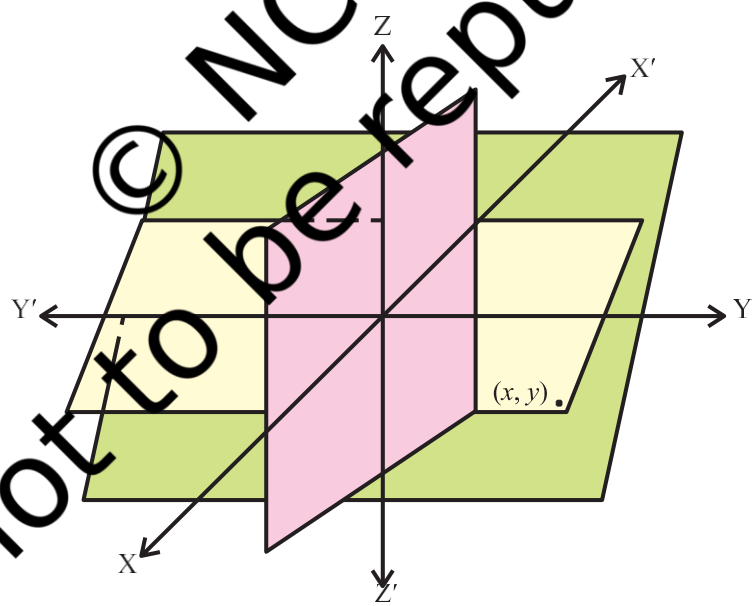


Fig. 27

4. Insert one rectangle from one side in the middle cutting the two orthogonally, and the other rectangle from the other side (see Fig. 27). The space is divided into eight parts by these three sheets. Each part is referred to as an octant.
5. Fix the model on a wooden board.
6. In one of the octants, fix rulers to represent *x*-axis, *y*-axis and *z*-axis. Extend each of the axis piercing to other sides to represent XX′, YY′ and ZZ′. Mark the point of intersection of XX′, YY′ and ZZ′ as origin O.

Demonstration

1. Fix a rod perpendicular to *xy*-plane at a point P (*x*, *y*) and parallel to *z*-axis.
2. Fix a wire joining the origin to the upper tip P′ (*x*, *y*, *z*) of this perpendicular rod.
3. The distance of point P on *xy*-plane with coordinates (*x*, *y*) from the origin is $\sqrt{x^2 + y^2}$.
4. The distance of P′ with coordinates (*x*, *y*, *z*) in space from the origin is $\sqrt{\left(\sqrt{x^2 + y^2}\right)^2 + z^2} = \sqrt{x^2 + y^2 + z^2}$.

Observation

1. The three planes are intersecting at right angles at a point and they divide the space into_____parts. Each part is called an_____.
2. Distance of the point (5, 4) on the *xy* plane from origin is_____.
3. Distance of the point (3, 2, 1) from the origin is_____.
4. If we fix a wire perpendicular to any of the planes, then it will represent _____to plane.
5. If two normals are drawn to any two of the planes, then these normals are _____to each other.

Application

1. Model can be used to visualise the position and coordinates of a point in space.
2. Model can be used to explain the distance of the origin from a point in the plane or in the space.
3. Model can also be used to explain the concept of a normal to a plane.

Activity 29

Objective

Verification of the geometrical significance of derivative.

Material Required

Graph sheets, adhesive, hardboard, trigonometric tables, geometry box, wires.

Method of Construction

1. Paste three graph sheets on a hardboard and draw two mutually perpendicular lines representing x-axis and y-axis on each of them.
2. Sketch the graph of the curve (circle) $x^2 + y^2 = 25$ on one sheet.
3. On the other two sheets sketch the graphs of $(x-1)^2 + y^2 = 25$ and the curve $xy = 4$ (rectangular hyperbola).

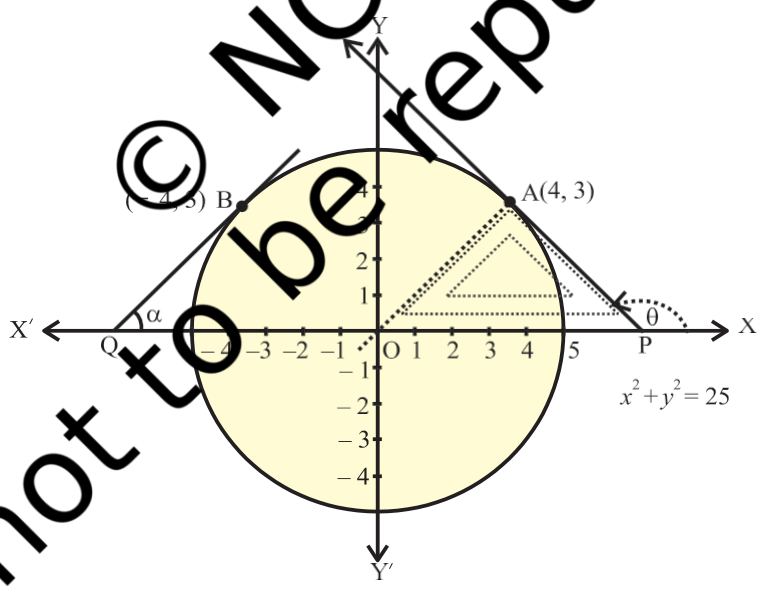


Fig. 29.1

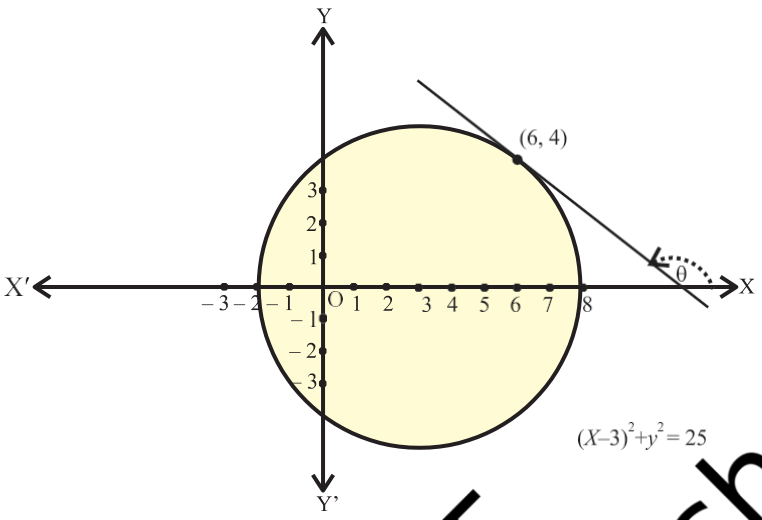


Fig 29.2

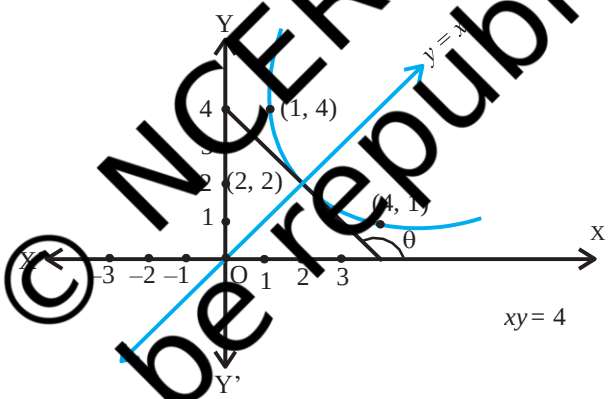


Fig. 29.3

DEMONSTRATION

1. Take first sheet on which, the graph of the circle $x^2 + y^2 = 25$ has been drawn (see Fig 29.1.
2. Take a point A (4, 3) on the circle.
3. With the help of a set square, place a wire in the direction OA and other perpendicular to OA at the point A to meet *x*-axis at a point (say P).

4. Measure the angle between the wire and the positive direction of x-axis at P (say θ).
5. Then find tan θ (with the help of trigonometric tables)

Now, $x^2 + y^2 = 25 \Rightarrow y = \sqrt{25 - x^2} \Rightarrow \frac{dy}{dx} = \frac{-x}{\sqrt{25 - x^2}}$.

Find $\frac{dy}{dx}$ at the point (4, 3) and verify that $\left(\frac{dy}{dx}\right)$ at (4, 3) = tan θ.

6. Similarly, take another point (– 4, 3) on the circle. Verify that $\frac{dy}{dx}$ at (– 4, 3) = tan α where α is the angle made by the tangent to the circle at the point (– 4, 3) with the positive direction of x-axis (see Fig. 29.1).
7. Take other sheet with the graph of $(x - 3)^2 + y^2 = 25$ and take the point (6,4) on it and repeat the above process using set square and wires as shown in Fig. 29.2, i.e. verify that $\frac{dy}{dx}$ at (6, 4) = tan θ.
8. Now take the third sheet, showing the graph of the curve $xy = 4$. Take the point (2, 2) on it. Place one perpendicular side of set square along the line $y = x$ and a wire along the other side touching the curve at the point (2, 2) and find the angle made by the wire with the positive direction of x-axis as shown in Fig. 29.3. Let it be θ. Verify that $\frac{dy}{dx}$ at (2, 2) = tan θ.

OBSERVATION

1. For the curve $x^2 + y^2 = 25$, $\frac{dy}{dx}$ at the point (3, 4) =_____. Value of θ = _____tan θ = _____ $\frac{dy}{dx}$ at (3, 4) =_____.

2. For the curve $x^2 + y^2 = 25$, $\frac{dy}{dx}$ at $(-4, 3)$ =_____, $\tan \alpha$ = _____

, $\frac{dy}{dx}$ at $(-4, 3)$ = _____.

3. For the curve $(x-3)^2 + y^2 = 25$, $\frac{dy}{dx}$ at $(6, 4)$ =_____, value of θ =_____,

$\tan \theta$ = _____ , $\frac{dy}{dx}$ at $(6, 4)$ = _____.

4. For the curve $xy = 4$, $\frac{dy}{dx}$ at $(2, 2)$ =_____,

θ =_____, $\tan \theta$ =_____.

NOTE

The activity may be repeated by taking point (4, 3) on first sheet, (0, 4) on second sheet and (1, 4) on the third sheet.

APPLICATION

Same activity can be used to verify the result that the slope of the tangent at a point is equal to the value of the derivative at that point for other curves.

SAINIK SCHOOL KALIKIRI

SUMMER VACATION HOLIDAY HOMEWORK

ON ART AND CRAFT

CLASS X

- **3 Portrait drawing with pencil shading and coloring**

छुट्टियों का गृहकार्य

कक्षा - दसवी

क्रम संख्या	गृहकार्य का विषय
1	समास भेद के बीस-बीस उदाहरण विग्रह के साथ लिखिए ।
2	50 मुहावरो का अर्थ लिखकर वाक्यों में प्रयोग करो।
3	'समय किसी के लिए नहीं रुकता' विषय पर अनुच्छेद 80-100 शब्दों में लिखिए।
4	आपके मोहल्ले को मुख्य सड़क से जोड़ने वाली सड़क की लाइटें खराब हो चुकी हैं। इस कारण रात में आने-जाने वालों को परेशानी का सामना करना पड़ता है। इससे कई दुर्घटनाएँ भी हो चुकी हैं। इनका उल्लेख करते हुए लोक निर्माण विभाग, रोहतक के मुख्य सड़क निरीक्षक को पत्र लिखिए।
5	अपने विद्यालय के प्रधानाचार्य को प्रार्थना पत्र लिखिए जिसमें विद्यालय के पुस्तकालय के लिए हिंदी पत्र-पत्रिकाएँ मँगवाने का अनुरोध किया गया हो।
6	परीक्षा की तैयारी कीजिए।

SAINIK SCHOOL KALIKIRI

Class -X 1.REAL NUMBERS **Subject- Maths**

1. find the LCM and HCF of smallest composite number and smallest prime number
2. If the LCM of a and 18 is 36 and the HCF of a and 18 is 2 then find the value of a.
3. If two positive integers p and q can be expressed as $p = ab^2$ and $q = a^3b$; a, b being prime numbers, then find LCM (p, q).
4. If p and q are positive integers such that $p = ab^2$ and $q = a^2b$, where 'a' and 'b' are prime numbers, then find the LCM (p, q).
5. If HCF of 510 and 92 is 2, then find the LCM.
6. Find the value of 'a', if HCF (a, 18) = 2 and LCM (a, 18) = 36.
7. The HCF of two numbers is 9 and their LCM is 2016. If the one number is 54, then find the other number.
8. Two numbers are in the ratio of 15:11. If their H.C.F. is 13, then find the numbers
9. Find the prime factorisation of 2120.
10. Find the prime factorisation of 108.
11. If p and q are two distinct prime numbers, then find their HCF.
12. Find the HCF of the smallest composite number and smallest prime number.
13. Find the LCM of smallest two-digit composite number and smallest composite number.
14. Find the ratio of LCM and HCF of the least composite and the least prime numbers.
15. The LCM of two numbers is 14 times their HCF. The sum of LCM and HCF is 600. If one number is 280, then find the other number
16. If HCF (26, 169) = 13, then find LCM (26, 169).
17. If HCF (90, 144) = 18, then find LCM (90, 144).
18. Show that the number 6^n never end with digit 0 for any natural number n.
19. Show that (7 x 13 x 11) +11 and (7 x 6 x 5 x 4 x 3 x 2 x 1) + 3 are composite numbers.
20. Find HCF and LCM of 625, 1125 and 2125 using prime factorisation.
21. Find the HCF and LCM of 96 and 404 using prime factorisation.
22. Find the HCF and LCM of 6, 72 and 120 using prime factorisation.
23. Given that $\sqrt{3}$ is irrational, prove that $5 + 2\sqrt{3}$ is irrational.
24. Given that $\sqrt{5}$ is irrational, prove that $3 - 2\sqrt{5}$ is irrational.
25. Given that $\sqrt{3}$ is irrational, prove that $2 - 5\sqrt{3}$ is irrational.
26. Given that $\sqrt{5}$ is irrational, prove that $2 + 3\sqrt{5}$ is irrational.
27. Prove that $\sqrt{3}$ is an irrational number.
28. Prove that $\sqrt{5}$ is an irrational number.
29. Prove that $\sqrt{2} + \sqrt{3}$ is an irrational number
30. Prove that $\sqrt{3} + \sqrt{5}$ is an irrational number

CHAPTER 02- POLYNOMIALS

SAMPLE PAPER

SUBJECT: MATHEMATICS **MAX. MARKS : 40**

CLASS : X **DURATION : 1½ hrs**

General Instructions:

(i). **All** questions are compulsory.

(ii). This question paper contains 2**0** questions divided into five Sections A, B, C, D and E.

(iii). **Section A** comprises of **10 MCQs** of **1 mark** each. **Section B** comprises of 4 questions of **2 marks** each. **Section C** comprises of 3 questions of **3 marks** each. **Section D** comprises of 1 question of **5 marks** each and **Section E** comprises of 2 Case Study Based Questions of **4 marks** each.

(iv). There is no overall choice.

(v). Use of Calculators is not permitted

SECTION – A

Questions 1 to 10 carry 1 mark each.

1. If one of the zeroes of the quadratic polynomial $(k – 1)x^2 + kx + 1$ is –3, then the value of k is
(a) 4/3 (b) -4/3 (c) 2/3 (d) -2/3

2. If the zeroes of the quadratic polynomial $x^2 + (a + 1) x + b$ are 2 and –3, then
(a) a = –7, b = –1 (b) a = 5, b = –1 (c) a = 2, b = –6 (d) a = 0, b = –6

3. Zeroes of a polynomial p(x) can be determined graphically. No. of zeroes of a polynomial is equal to no. of points where the graph of polynomial
(a) intersects y-axis (b) intersects x-axis
(c) intersects y-axis or intersects x-axis (d) none of these

4. If graph of a polynomial p(x) does not intersects the x-axis but intersects y-axis in one point, then no. of zeroes of the polynomial is equal to
(a) 0 (b) 1 (c) 0 or 1 (d) none of these

5. If $p(x) = ax^2 + bx + c$ and a + b + c = 0, then one zero is
(a) -b/a (b) c/a (c) b/c (d) none of these

6. The number of polynomials having zeroes as –2 and 5 is
(a) 1 (b) 2 (c) 3 (d) more than 3

7. The quadratic polynomial, the sum of whose zeroes is –5 and their product is 6, is
(a) $x^2 + 5x + 6$ (b) $x^2 – 5x + 6$ (c) $x^2 – 5x – 6$ (d) $–x^2 + 5x + 6$

8. If zeroes of $p(x) = 2x^2 – 7x + k$ are reciprocal of each other, then value of k is
(a) 1 (b) 2 (c) 3 (d) 4

In the following questions 9 and 10, a statement of assertion (A) is followed by a statement of reason (R). Mark the correct choice as:

(a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).
(b) Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).
(c) Assertion (A) is true but reason (R) is false.
(d) Assertion (A) is false but reason (R) is true.

9. **Assertion (A):** $x^2 + 4x + 5$ has two real zeroes.
Reason (R): A quadratic polynomial can have at the most two zeroes.

10. Assertion (A): If the sum of the zeroes of the quadratic polynomial $x^2 - 2kx + 8$ are is 2 then value of k is 1.
Reason (R): Sum of zeroes of a quadratic polynomial $ax^2 + bx + c$ is $-b/a$

SECTION – B

Questions 11 to 14 carry 2 marks each.

11. Find the zeroes of $\sqrt{3}x^2 + 10x + 7\sqrt{3}$

12. Find a quadratic polynomial whose zeroes are –9 and $-\frac{1}{9}$.

13. If the sum of the zeroes of the quadratic polynomial $ky^2 + 2y - 3k$ is equal to twice their product, find the value of k.

14. If the product of the zeroes of the polynomial $ax^2 - 6x - 6$ is 4, then find the value of a. Also find the sum of zeroes of the polynomial.

SECTION – C

Questions 15 to 17 carry 3 marks each.

15. Find the zeroes of $p(x) = 4x^2 + 24x + 36$ quadratic polynomials and verify the relationship between the zeroes and their coefficients.

16. If α and β are zeroes of the quadratic polynomial $4x^2 + 4x + 1$, then form a quadratic polynomial whose zeroes are 2α and 2β.

17. If α, β re zeros of quadratic polynomial $2x^2 + 5x + k$, find the value of k such that $(\alpha + \beta)^2 - \alpha\beta = 24$

SECTION – D

Questions 18 carry 5 marks.

18. If α, β are zeroes of polynomial $p(x) = 5x^2 + 5x + 1$ then find the value of
(i) $\alpha^2 + \beta^2$ (ii) $\alpha^{-1} + \beta^{-1}$ (iii) $\alpha^3 + \beta^3$

SECTION – E (Case Study Based Questions)

Questions 19 to 20 carry 4 marks each.

19. Case Study-1 : **Lusitania Bridge**

Quadratic polynomial can be used to model the shape of many architectural structures in the world. The Lusitania Bridge is a bridge in Merida, Spain. The bridge was built over the Guadiana River in 1991 by a Spanish consortium to take the road traffic from the Romano bridge. The architect was Santiago Calatrava. The bridge takes its name from the fact that Emerita Augusta (present day Merida) was the former capital of Lusitania, an ancient Roman province.

Based on the above information, answer the following questions.

(i) If the Arch is represented by $10x^2 – x – 3$, then find its zeroes. (2)

(ii) Find the quadratic polynomial whose sum of zeroes is 0 and product of zeroes is 1. (2)

OR

(ii) Find the sum and product of zeroes of the polynomial $\sqrt{3}\ x^2 – 14x + 8\sqrt{3}$ (2)

20. The figure given alongside shows the path of a diver, when she takes a jump from the diving board. Clearly it is a parabola. Annie was standing on a diving board, 48 feet above the water level. She took a dive into the pool. Her height (in feet) above the water level at any time 't' in seconds is given by the polynomial h(t) such that $h(t) = -16t^2 + 8t + k$.

(i) What is the value of k? (2)

(ii) At what time will she touch the water in the pool? (2)

OR

(ii) Rita's height (in feet) above the water level is given by another polynomial p(t) with zeroes -1 and 2. Then find p(t) (2)

QUADRATIC EQUATIONS

SUBJECT: MATHEMATICS **MAX. MARKS : 40**

CLASS : X **DURATION : 1½ hrs**

General Instructions:

(i). **All** questions are compulsory.

(ii). This question paper contains 2**0** questions divided into five Sections A, B, C, D and E.

(iii). **Section A** comprises of **10 MCQs** of **1 mark** each. **Section B** comprises of 4 questions of **2 marks** each. **Section C** comprises of 3 questions of **3 marks** each. **Section D** comprises of 1 question of **5 marks** each and **Section E** comprises of 2 Case Study Based Questions of **4 marks** each.

(iv). There is no overall choice.

(v). Use of Calculators is not permitted

SECTION – A

Questions 1 to 10 carry 1 mark each.

1. If a and b are the roots of the equation $x^2 + ax - b = 0$, then find a and b.

(a) $a = -1$ and $b = 2$ (b) $a = 1$ and $b = 2$

(c) $a = -2$ and $b = 1$ (d) $a = 2$ and $b = -1$

2. Which of the following are the roots of the quadratic equation, $x^2 - 9x + 20 = 0$?

(a) 3, 4 (b) 4, 5 (c) 5, 6 (d) 6, 7

3. If $(1 - p)$ is a root of the equation $x^2 + px + 1 - p = 0$, then roots are

(a) 0, 1 (b) – 1, 1 (c) 0, – 1 (d) – 1, 2

4. Which of the following equations has two distinct real roots?

(a) $2x^2 - 3\sqrt{2}\,x + \frac{9}{4} = 0$ (b) $x^2 + x - 5 = 0$

(c) $x^2 + 3x + 2\sqrt{2} = 0$ (d) $5x^2 - 3x + 1 = 0$

5. Which of the following equations has no real roots ?

(a) $x^2 - 4x + 3\sqrt{2} = 0$ (b) $x^2 + 4x - 3\sqrt{2} = 0$

(c) $x^2 - 4x - 3\sqrt{2} = 0$ (d) $3x^2 + 4\sqrt{3}\,x + 4 = 0$

6. If the roots of $ax^2 + bx + c = 0$ are equal in magnitude but opposite in sign, then

(a) $a = 0$ (b) $b = 0$ (c) $c = 0$ (d) none of these

7. If the roots of equation $3x^2 + 2x + (p + 2)(p - 1) = 0$ are of opposite sign then which of the following cannot be the value of p?

(a) 0 (b) – 1 (c) $\frac{1}{2}$ (d) – 3

8. The value of k for which the equation $x^2 + 2(k + 1)x + k^2 = 0$ has equal roots is

(a) – 1 (b) $-\frac{1}{2}$ (c) 1 (d) none of these

In the following questions 9 and 10, a statement of assertion (A) is followed by a statement of reason (R). Mark the correct choice as:

(a)Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).

(b)Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).

(c)Assertion (A) is true but reason (R) is false.

(d)Assertion (A) is false but reason (R) is true.

9. **Assertion (A):** If one root of the quadratic equation $6x^2 - x - k = 0$ is $\frac{2}{3}$, then the value of k is 2.

Reason (R): The quadratic equation $ax^2 + bx + c = 0$, $a \neq 0$ has almost two roots.

10. **Assertion (A):** The roots of the quadratic equation $x^2 + 2x + 2 = 0$ are imaginary
Reason (R): If discriminant $D = b^2 - 4ac < 0$ then the roots of quadratic equation $ax^2 + bx + c = 0$ are not real i.e. imaginary.

SECTION – B

Questions 11 to 14 carry 2 marks each.

11. Solve for x : $4x^2 - 2(a^2 + b^2)\,x + a^2\,b^2 = 0$.

12. The sum of the squares of three consecutive positive integers is 50. Find the integers.

13. Find the value of α such that the quadratic equation $(\alpha - 12)x^2 + 2(\alpha - 12)x + 2 = 0$, has equal roots.

14. Find the value of p, for which one root of the quadratic equation $px^2 - 14x + 8 = 0$ is 6 times the other.

SECTION – C

Questions 15 to 17 carry 3 marks each.

15. If -5 is a root of the quadratic equation $2x^2 + px - 15 = 0$ and the quadratic equation $p(x^2 + x) + k = 0$ has equal roots, find the value of k.

16. If the equation $(1 + m^2)x^2 + 2mcx + c^2 - a^2 = 0$ has equal roots, then show that $c^2 = a^2(1 + m^2)$.

17. Solve the following for x : $\frac{1}{2a+b+2x} = \frac{1}{2a} + \frac{1}{b} + \frac{1}{2x}$

SECTION – D

Questions 18 carry 5 marks.

18. In a flight of 600 km, an aircraft was slowed due to bad weather. Its average speed for the trip was reduced by 200 km/hr and time of flight increased by 30 minutes. Find the original duration of flight.

SECTION – E (Case Study Based Questions)

Questions 19 to 20 carry 4 marks each.

19. Raj and Ajay are very close friends. Both the families decide to go to Ranikhet by their own cars. Raj's car travels at a speed of x km/h while Ajay's car travels 5 km/h faster than Raj's car. Raj took 4 hours more than Ajay to complete he journey of 400 km.

(a) What will be the distance covered by Ajay's car in two hours? (1)
(b) Which of the following quadratic equation describe the speed of Raj's car? (2)
(c) What is the speed of Raj's car? (1)

20. John and Jivanti are playing with the marbles. They together have 45 marbles. Both of them lost 5 marbles each, and the product of the number of marbles they now have is 124.

(a) Find the quadratic equation related to the given problem (2)
(b) Find the Number of marbles John had. (2)

సైనిక పాఠశాల కలికిరి

గైహికము

10 వ తరగతి

Holiday Homework(2024-25)	Class: X	Sub: Telugu

1. మాతృభావన పాఠ్యాంశములోని పువ్వు గుర్తు కలిగిన పద్యములన్నింటికీ ప్రతిపదార్థ భావములు వ్రాయండి.
2. వాతావరణ కాలుష్యము , విద్యార్థులు – సంఘసేవ, వార్తా పత్రికలు, క్రీడలు లాభాలు, స్వచ్ఛభారత్, అవినీతి-నిర్మూలనల పై మీ సొంతమాటల్లో వ్యాసములు వ్రాయండి.
3. ఉత్పలమాల, చంపకమాల, శార్దూలము, మత్తేభ పద్యలక్షణాలు వ్రాయండి.
4. ఉపమ, అతిశయోక్తి, అర్థాంతరన్యాస, క్రమాలంకారములను గురించి ఉదాహరణ సహితముగా వ్రాయండి.
5. ద్వంద, ద్విగు, బహువ్రీహి, రూపకసమాసములను గురించి ఉదాహరణ సహితముగా వ్రాయండి.

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SAINIK SCHOOL KALIKIRI

LEARN TO LEAD (CBSE AFFIL: 180019)

Holiday Home Work

Class X **Sub: Social Science**

Task: Subject Enrichment Activity/ Inter disciplinary Art Integrated project

Topic: Making of Global World

Subtopics 2 to 4.4 -The nineteenth century (1815-1914) to end of Bretton Woods & the beginning of "Globalization"

- Analyse the implication of globalization for local economies.
- Discuss how globalization is experienced differently by different social groups.

Interdisciplinary Project.

1) Constructivism

2) Inquiry based learning

3) Cooperative learning

4) Learning station

5) Collaborative learning

6) Videos/ Visuals/ documentaries/ movie clippings

7) Carousel technique

8) Art integrated learning

9) Group Discussions

10) Toy making

NCC Holiday Homework Instructions

To make the most of your NCC holiday homework, we've streamlined the process for you. Follow these steps to ensure you complete your tasks effectively:

Download the DGNCC Training App(i.e. https://play.google.com/store/apps/details?id=com.chl.ncc): Head over to the Google Play Store and install the DGNCC Training App on your device. This app is your gateway to accessing essential NCC training materials.

Navigate to "Presis": Once the app is installed, open it and click on the "Presis" section. Here, you'll find a range of resources tailored to your NCC training needs.

Access Junior Cadets Content: Within "Presis," locate the section dedicated to Junior Cadets. This is where you'll find content specifically designed for cadets like you.

Download "Common Subjects": Under the Junior Cadets section, look for the option to download "Common Subjects." This contains valuable material pertinent to your NCC training.

Explore Official NCC SD Common Subject Content: Once downloaded, delve into the official release of NCC SD Common Subject content. This material is curated to enrich your understanding of essential subjects.

Read and Summarize: Your task is to thoroughly read the common subject content. Choose any 15 chapters that pique your interest, and submit important headings from each chapter.

Remember, this holiday homework is not just about completing tasks but also about deepening your knowledge and understanding of NCC principles. Should you have any questions or encounter any difficulties, don't hesitate to reach out for assistance. (+91 7981070167 ANO S/O Jagdish Babu)

Best wishes for a productive holiday period!

Dept of NCC, Sainik School Kalikiri

SAINIK SCHOOL KALIKIRI

Sub: Social Science **Class: X**

Holiday Homework: Project Work

Interdisciplinary project as part of multiple assessment

Topic:

1. Globalization and the Indian Economy – Economics Production across the countries • Chinese toys in India • World Trade Organization • The Struggle for a Fair Globalization	Class X
2. Consumer Rights Consumer Awareness - Economics	Class X

1. **Objective**: Cadets are expected to apply the Social Science concepts that they have leant over the years in order to prepare the project report.

2. If required, cadets may go out for collecting data and use different primary and secondary resources to prepare the project. If possible, various forms of art may be integrated in the project work.

3. The distribution of marks over different aspects relating to Project Work is a s follows:

S. No	Aspects	Marks
1	Content accuracy, originality and analysis	2
2	Presentation and creativity	2
3	Viva Voice	1

4. The Project Report should be **handwritten** by the students themselves.

SUMMER VACATION HOLIDAY HOME WORK – 2024 - 2025
CLASS X ENGLISH

Grammar	
	Error Correction – Tense
Q 1	The following passage has not been edited. There is one error in each line. Write the incorrect word and the correction in your answer sheet against the correct question number. The first one has been done as an example. (4 Marks Each) Dolphins and killer whales has learned elaborate routine [Error: has; Correction: have] to entertain aquarium audiences. They are thought by men to being even more scientifically (a) [Error: _____; Correction: _____;] intelligent then me. In scientific (b) [Error: _____; Correction: _____ ;] experiments they had showed great (c) [Error: _____; Correction: _____;] skill for distinguishing between objects. (d) [Error: _____; Correction: _____;]
Q2.	The following passage has not been edited. There is one error in each of the lines. Write the incorrect word and the correction in the space provided: ($^1/_2$ x 8 = 4 marks) Community service sensitise people to (a) [Error: _____; Correction: _____;] other's needs and supports inclusive (b) [Error: _____; Correction: _____;] development to the underprivileged (c) [Error: _____; Correction: _____;] sections with society. Courses about social (d) [Error: _____; Correction: _____;] work prepares frontline workers to (e) [Error: _____; Correction: _____;] takes up assignments in social welfare (f) [Error: _____; Correction: _____;] organizations. Practical work including (g) [Error: _____; Correction: _____;] 50 hour of structured internship to man projects.(h) [Error: _____; Correction: _____;]
Q3.	The following passage has not been edited. There is one error in each line. Write the incorrect word and the correction in your answer sheet against the correct question number. (4 marks) Madhubani Painting is one in the many traditional (a) [Error: _____; Correction: _____;] Indian art forms. It is but known as Mithila or Godhna (b) [Error: _____; Correction:_____;] Paintings.This art developed by Mithila or Madhubani district (c)[Error: ___; Correction: __;] of Bihar or then spread to villages around Madhubani (d) [Error: _____; Correction: _____;]
Q4.	The following paragraph has not been edited. There is an error in each line. Identify the error and write the correct word against the correct blank number. Vijender Singh of Bhiwani, be the (a) [Error: _____; Correction: _____;] first Indian boxer as bring an Olympic (b) [Error: _____; Correction: _____;] medal to India at 2008. (c) [Error: _____; Correction: _____;] Vijender was encouraged from his coach (d) [Error: _____; Correction: _____;]

SUMMER VACATION HOLIDAY HOME WORK – 2024 - 2025
CLASS X ENGLISH

Q5.	The following paragraph has not been edited. There is one error in each line. Identify the error and write it along with the corrections. Underline the correct word supplied by you. The first one has been done as an example for you. (4 marks) Gold prices are now touched an all time [Error: _____; Correction: _____;] high. Some says it could be a bubble (a) [Error: _____; Correction: _____;] that may grown but will at last (b) [Error: _____; Correction: _____;] burst after recession in a (c) [Error: _____; Correction: _____;] West was over. So, investment (d) [Error: _____; Correction: _____;] in gold may not be a good idea now.
Q6.	Following paragraph has not been edited. There is an error in each numbered write the correction against the correct blank number. Remember to underline has been done as an example. (4 marks) When it comes to nutrients, almonds really know how to shine! This all in one nut was snacked [Error: was; Correction: is;] with multiple benefits who help in weight (a) [Error: _____; Correction: _____;] management, maintain blood glucose levels (b) [Error: _____; Correction: _____;] and providing essential nutrients. Almonds is (c) [Error: _____; Correction: _____;] an excellence source of vitamin-E, magnesium, (d) [Error: _____; Correction: _____;] and manganese.

Writing	
	Letter to editor
1	As a responsible citizen, you are concerned about the condition of Marine Lines. People have littered the entire place with plastic, masks and garbage. Write a letter to the editor of a leading daily to spread awareness on the matter.
2	You are Kritika. Your school's Yoga Club hosted a workshop called "Art of Living for Students." Write a letter to the editor of the local daily newspaper in roughly 100-120 words giving your thoughts on the matter.
3	While riding the Metro, you may have seen that, despite increased surveillance, people attempt to deface Metro trains and stations. Write a letter to the editor of an evening newspaper urging DMRC, Delhi, to begin school-based awareness programmes in collaboration with the Directorate of Education, describing how such programmes could assist to improve people's attitudes. You are Sudhir/Sweety of 3-B DDA Flats, Punjabi Bagh, New Delhi.
4	You are Radhika, a member of NGO Rahat which mainly works in spreading environmental awareness about conservation and clean water resources. Write a letter to the editor of your local newspaper raising awareness about cleaning the Yamuna river.
5	Write a letter to the editor about the open garbage area situated in your locality and how it's harmful to everyone including stray animals, the greener parks as well as schools and residential societies situated around it.

6	You are Harry, the president of Samaj Society, Rishi Nagar. There is a shortage of water and infrequent availability of water for the last three weeks which is causing issues for the residents. Write a letter to the editor of your local newspaper voicing the problems and issues faced by the residents of your society.
7	You are Christy, a resident of Palm Hill Society. Due to the breakdown of a mobile tower in your area, the internet connection has been impacted. Most of the residents in your society are working from home and children are studying online due to the lockdown in Delhi the infrequent internet connection is causing many issues. Write a letter to the editor of your local newspaper asking him/her to raise this issue in their daily newspaper.
8	You are Lakshmi, a student of P.D Public School, Delhi. You are concerned about the red-listing of India by popular countries and how this could affect your study-abroad plans. Write a letter to the editor of a newspaper highlighting the need to enforce a comprehensive plan for Indian students aspiring to go abroad for higher studies.
9	You are Amit, a student of Modern Public School, Mumbai. You are concerned about the lack of awareness around animal rights. Write a letter to the editor about the need to raise awareness about animal rights in schools and colleges in India.
10	You are Rahul, a student from Kendriya Vidyalaya. You are concerned about the large political rallies carried by popular parties for elections. Write a letter to the editor of a newspaper raising concern about the grave impact of large gatherings amidst the pandemic.
11	Every day you are late for school by fifteen minutes. Your school bus is stuck in a traffic jam near the Chintpumi Temple crossing. Along with your own ideas, write a letter to the editor of a newspaper highlighting this problem and suggesting some remedy for it.
12	You recently visited a significant historical site. You were astounded to discover it in such a condition of disrepair. Using the clues from the unit 'Travel and Tourism,' as well as your own thoughts, compose a letter to the editor of a major newspaper noting the terrible condition of significant archaeological and historical sites. Highlight the lack of vital services, the poor condition of upkeep, and people's abuse of it. Make suggestions about how to improve the issue.
13	You are Rishi/Rishita of C–105, Janak Puri, New Delhi. You are extremely disturbed by reading about attacks on old people living alone. Write a letter to the Editor of "The New Indian Express" sensitizing people and drawing attention to this problem.

First Flight

Unit 1 – A Letter to God

1 Lencho's actions in the first paragraph show that he was _____.

A. Baffled
B. Alarmed
C. Concerned
D. Encouraged

2 Was Lencho's prediction of the weather accurate? Give reasons for your answer.

_____

_____

3 Why are locusts mentioned in the text?

A. To show how unpredictable farming can be
B. To compare this event to a past experience
C. To suggest that God was playing a role in the events
D. To indicate how much damage was done to the crops

4 *Lencho was an ox of a man, working like an animal in the fields, but still he knew how to write.* What attitude does this sentence highlight?

A. Prejudice
B. Tolerance
C. Scepticism
D. Appreciation

5 Why is Lencho compared to an ox?

A. To suggest that people underestimated him
B. To show how hard he worked
C. To insult his intelligence
D. To emphasise his size

6 What was the family's attitude the night after the hailstorm?

A. Frustrated
B. Optimistic
C. Confident
D. Furious

7 How did the postman feel when he found the letter?

A. Amused
B. Amazed
C. Generous
D. Sympathetic

8 Why did Lencho call the post office employees crooks?

_____

_____

9 Lencho's response to the first letter shows that his faith in God can be best described as_____.

A. Shaken
B. Evolving
C. Absolute
D. Newly discovered

10 After reading the second letter the postmaster is most likely to have been _____.

A. Alarmed
B. Offended
C. Distressed
D. Bewildered

L-1 A Letter to God

Multiple Choice Questions based on an extract

(A) The house- the only one in the entire valley -sat on the crest of a low hill. From this height one could see the river and the field of ripe corn dotted with the flowers that always promised a good harvest. The only thing the earth needed was a good downpour or at least a shower. Throughout the morning Lencho -who knew his fields intimately- had done nothing but see the sky towards the north-east.

(i) Based on the detail of the house's location, how can it best be described?
a) majestic b) imposing c) solitary d) unique

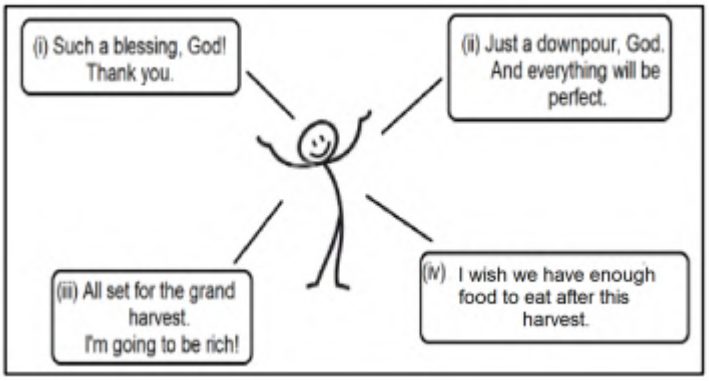
(ii) The field of corn dotted with flowers means that a) not a single flower was bigger than a dot b) the flowers were scattered across. c) the flowers were in shaped like dots. d) the flowers had shrunk in size

(iii) Lencho wished for a downpour or a heavy shower. Pick the option that correctly lists the correct match for kinds of rain

(1) **heavy rain**	(i) light rain that falls in very fine drops
(2) **thunderstorm**	(ii) very heavy rain, tropical rain
(3) **drizzle**	(iii) it's coming down quite strong and you get very wet very quickly
(4) **torrential rain**	(iv) really heavy rain that comes very suddenly
(5) **downpour**	(v) is a violent, short-lived weather disturbance associated with lightning, thunder and strong, gusty winds.

a) 1-ii,2-iv,3-v,4-i,5-iii
b) 1-iv,2-i,3-iii,4-v,5-ii
c) 1-v,2-iii,3-iv,4-ii,5-i
d) 1-iii,2-v,3-i,4-ii,5-iv

(iv) Based on the given extract, what is Lencho NOT likely to think while looking at his field?

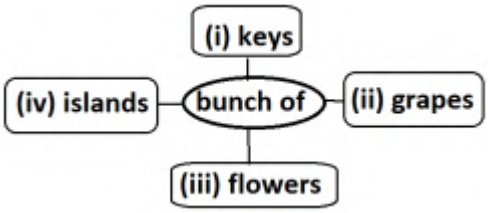


a) Option (i)
b) Option (ii)
c) Option (iii)
d) Option (iv)

(v) Which quote supports the idea in the given extract?
a) "Farming is a profession of hope."
b) "I would rather be on my farm than be emperor of the world."
c) "Farming looks mighty easy when your plough is a pencil, and you're a thousand miles from the corn field."
d) "Those too lazy to plough in the right season will have no food at the harvest."

(B) When he finished, he went to the window to buy a stamp which he licked and then affixed to the envelope with a blow of his fist. The moment the letter fell into the mailbox the postmaster went to open it. It said: "God: Of the money that I asked for, only seventy pesos reached me. Send me the rest, since I need it very much. But don't send it to me through the mail because the post office employees are a bunch of crooks. Lencho."

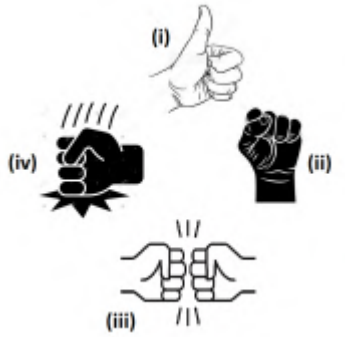
(i) '…bunch of crooks.' Pick the option that DOES NOT collate with 'bunch of', correctly.



a) option (i)
b) option (ii)
c) option (iii)
d) option (iv)

(ii) What was the most likely response that the postmaster expected in Lencho's second letter?
i) sorrowful
ii) gratitude
iii) disappointment
iv) elation
v) shock
a) ii and v
b) i and iii
c) ii and iv
d) iii and v

(iii) Pick the option that lists the option corresponding to—'with a blow of his fist.'



a) Option (i) b) Option (ii) c) Option (iii) d) Option (iv)

(iv) Lencho's letter included
a) details of his problems.
b) description of the post office.
c) belief of being looted.
d) List of further demands.

(v) Pick the most suitable quote for this extract.
a) "It is easier to fool people than to convince them that they have been fooled." – Mark Twain
b) "Real knowledge is to know the extent of one's ignorance."- Confucius
c) "You see a person's true colours when you are no longer beneficial to their life."- anonymous
d) "True generosity means accepting ingratitude." - Coco Chanel

Answer in 20-30 words

(i) People get support from family and friends during bad times. How does Lencho's family behave after the harvest is ruined?

(ii) 'Lencho was an ox of a man, working like an animal in the fields, but still he knew how to write.' What does this line tell us about the norm amongst such farmers, then?

(iii) What, according to you would have been the likely reaction of Lencho's wife upon knowing about him writing an actual letter to God?

(iv) Lencho waited eagerly for a reply to his letter to God. Do you think the postmaster was also very keen to know Lencho's reaction upon receiving the 'reply'?

Answer in 40-50 words

(i) 'The field was white, as if covered with salt.' This is how the field is described after the hailstorm. The pelting hailstones could have been easily seen as sugar cubes. Do you think comparing it with sugar would have been more appropriate? Why/ Why not?

(ii) Lencho and his family knew the implications the hailstorm would have on their lives. Write a conversation between Lencho and his wife as they watched the downpour turn to a hailstorm.

(iii) Lencho did not bother exploring any other means to resolve his situation but just turned to God. Do you feel that his approach was justified? Why/Why not?

Answer in 100-120 words (beyond text and across texts)

(i) The people at the post-office contribute to put together whatever they can manage, for Lencho. (a) What do you think was the main reason behind their help? Would you have done the same if you were one of the employees? (b) As an employee, write about your perspective and reason(s) for contributing to the fund. The fact that you don't want to say 'no' to a cause initiated by your boss, can also be an equally compelling reason!

(ii) Read the given anecdote and analyse the similarities and differences with reference to 'A Letter to God'. A very poor woman called-in a radio station asking for help from God. A non-believer, also listening to this radio program, decided to make fun of the woman. He got her address, called his secretary and ordered her to buy food and take it to the woman. However, the instruction was: "When the woman asks who sent the food, tell her that it's from the devil.'' When the secretary arrived at the woman's house, the woman was very happy and grateful for the help. The Secretary then asked her, ''Don't you want to know who sent the food?'' The woman replied, ''No, I don't even care because when God orders, even the devil obeys!

(iii) The postmaster was a representative of God. Evaluate this statement in the context of your understanding of 'A Letter to God".

P-1 Dust of Snow

Multiple Choice Questions based on Extract

(A) The way a crow
Shook down on me
The dust of snow
From a hemlock tree
Has given my heart
A change of mood
And saved some part
Of a day I had rued.

SAINIK SCHOOL KALIKIRI

ACADEMIC YEAR: 2024-25

X SCI HOLIDAY HOMEWORK

PART A : ART INTEGRATED PROJECT

1. Attempt any 3-project work from the following:

(a) Investigate different types of renewable energy sources such as solar, hydro, geothermal energy. Make a PPT (5 to 10 slides) to compare present status and future potential of any one renewable energy in Andhra Pradesh and in the state Haryana.

(b) Create an infographic that combines scientific data on climate change with artistic elements. You can illustrate concepts like greenhouse gas emissions, the melting of polar ice caps, or the impact of deforestation, using visually appealing graphics and artwork.

(c) Artistic representations of any one body systems/part. Cadets can use

various art mediums like sketches, paintings, or sculptures to showcase the skeletal, muscular, circulatory, or nervous systems.

(d) Design and create sculptures using recycled materials to raise awareness about environmental issues. Cadets can incorporate scientific concepts related to sustainability, pollution, or biodiversity into their sculptures while also focusing on aesthetics and artistic expression.

(e) Any advanced technologies/ scientific phenomena through art.

(f) Choose an element from the periodic table and create artwork inspired by its properties and uses. Cadets can incorporate symbols, colors, and images that represent the element's atomic structure, chemical reactions, or industrial applications.

(g) Research different chemical compounds and create three-dimensional models using art supplies like clay, wire, or paper. Student can focus on illustrating the molecular structure and bonding arrangements of compounds such as water, carbon dioxide, or sodium chloride.

(h) "Investigate the impacts of the ongoing heatwave on your locality and outline the steps taken to tackle this pressing issue."

2. POSTER / CONCEPT MAP making on the topic: (all three)

(a) Light Properties

(b) REDOX Reaction

(c) Life processes or Management of Natural Recourses

PART B : SUBJECT ENRICHMENT ACTIVITY

 Need to write <u>QUESTION & ANSWER</u> both in Physics, Chemistry and Biology note book:

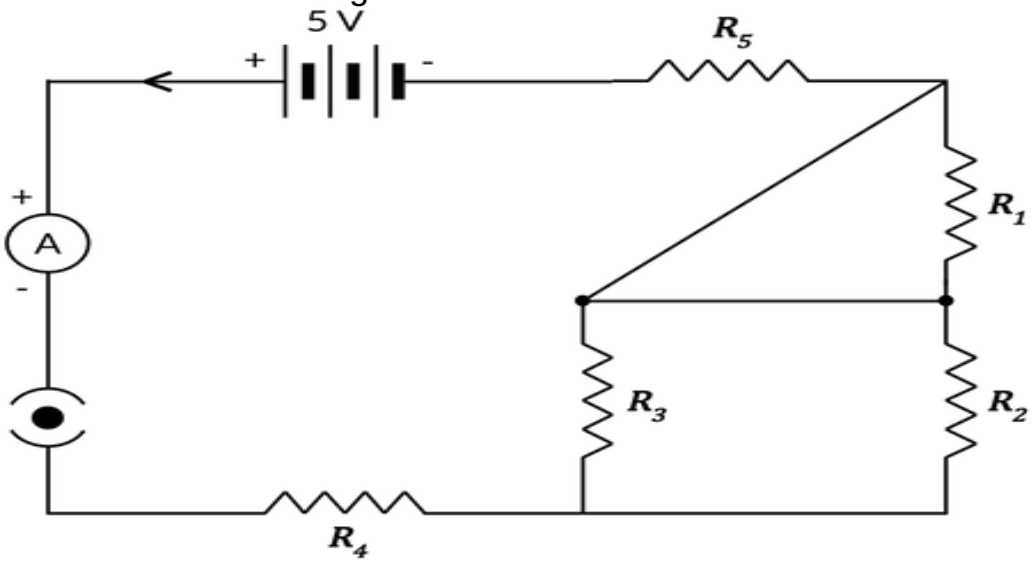
PHYSICS:

1. Calculate the area of cross section of a wire of length 2m, its resistance is 25Ω and the resistivity of material of wire is $1.84*10^{-6}$ Ωm.

2. A current of 8 A flows through a conductor for two minutes.
(a) Calculate the amount of charge passed through any area of cross section of the conductor.
(b) Calculate the total number of electrons flowing.

3. (a) Define the term 'volt'.
(b) State the relation between work, charge and potential difference for an electric circuit.
(c) Calculate the potential difference between the two terminals of a battery if 100 J of work is required to transfer 20 C of charge from one terminal of the battery to the other.

4. Consider the following electric circuit.



(a) Which two resistors are connected in series?
(b) Which two resistors are connected in parallel?
(c) If every resistor is 2ohm, what current will flow in the circuit?

5. A fuse wire melts at 5 A . If it is desired that the fuse wire of the same material melt at 10 A, then should the new fuse wire be of smaller or larger radius than the earlier one? Give reasons for your answer.

CHEMISTRY:

1. Samuel had a silver coin which turned black. He kept coin in a bowl lined with aluminium foil. Then he filled the bowl with water and boiled it. After sometime, he found that the coin has become new. Its blackness disappeared. How did it happen?

2. A water insoluble substance X on reaction with dilute hydrochloric acid released a colourless and odourless gas accompanied by brisk effervescence. When the gas passed through water, the solution obtained turns blue litmus red. On bubbling the gas trough lime water, it initially became milky and milkiness disappeared when the gas was passed in excess. Identify the substance X. Write the chemical equation of the reaction involved.

3. A strip of metal X is dipped in a blue colored salt solution YSO_4. After some time, a layer of metal Y from the salt solution is formed on the surface of metal strip X. Metal X is used in galvanization whereas metal Y used in making electric wires. Metal X and metal Y together form an alloy Z.
   a) What could metal X be? b) What could metal Y be? c) Name the metal salt YSO_4.
   d) What type of chemical reaction takes place when metal X reacts with salt solution YSO_4? Write the equation of the chemical reaction involved.
   e) Name the alloy Z.

4. An aqueous solution of metal nitrate P reacts with sodium bromide solution to form a yellow ppt. of a compound Q which is used in photography. Q undergoes photochemical decomposition. Identify and name P and Q. Write the chemical equation for the reactions involved. Also identify the type of reaction.

5. Take 3g of barium hydroxide in a test tube, now add amount 2g of ammonium chloride and mix the contents with the help of the glass rod. Now touch the test tube from outside. (i) What do you feel on touching the test tube? (ii) State the inference about the type of reaction occurred. (iii) Write the balanced chemical equation of the reaction involved.

6. Name the substance oxidised and reduced, and also identify the oxidising agents and reducing agents in the following reactions: (i) $Fe_2O_3 + 3CO \rightarrow 2Fe + 3CO_2$. (ii) $3MnO_2 + 4Al \rightarrow 3Mn + 2Al_2O_3$ (iii) $H_2S + SO_2 \rightarrow S + H_2O$

7. Can we stir silver nitrate solution with a copper spoon? Why or why not? Support you answer. (b) Why a brown coating is formed on the iron rod when iron rod is kept dipped in copper sulphate solution for some time? What change will be observed in the colour of the solution. (c) A green coating develops on the copper vessel in the rainy season. Why?

8. Practice NCERET EXERCISE & EXEMPLAR question of Chemical reaction and equation.

BIOLOGY:

1. Discuss the objectives of Namami Ganga Programme.

2. Chipko movement was stared in 1970s in a small village of Garhwal high up in Himalayas. Villagers stood against greedy contractors. Women folk hugged the trees. The Chipko - movement spread slowly to all nearby areas under the leadership of Shri Sunder Lal Bahuguna.

(i) Do you feel inspired by this movement which prevented felling of trees?
(ii) Who do you think are real stakeholders?
(iii) Which old belief has been challenged by Chipko movement?

3. Water finds a very important role in our day to day life but a large portion of our population has no access to pure drinking water. Many of them are also suffering from waterborne diseases.
   (i) What makes water unsafe for drinking?
   (ii) What steps should an individual take to prevent pollution of water?

4. Which of the two is better option:
   (i) To collect rain water in ponds or artificial lakes
   (ii) To let it recharge ground water by water harvesting.
   List two causes for the failure of sustained availability of ground water.

IX

SCIENCE HOLIDAY HOMEWORK

Physics

Note: Write physics holiday assignments in a separate long size notebook (192 pages) or A4 paper. Prepare a cover page titled as **Portfolio**.

Q1.Write Mind map from **Chapter Motion** on the following topics.

a) Distance
b) Displacement
c) Speed
d) Average speed
e) Velocity
f) Average velocity
g) Uniform motion and non - uniform motion.
h) Acceleration

Q2. Solve the attached worksheet on Motion.

Reference books:

NCERT Text book

NCERT Exemplar

SAINIK SCHOOL KALIKIRI

ANNAMAYA - 517234

MOTION WORKSHEET

Class 09 - Science

1. A moving body is covering a distance directly proportional to the square of time. The acceleration of the body is: **[1]**

   a) constant
   b) zero
   c) increasing
   d) decreasing

2. Which of the following is the characteristic of displacement of an object? **[1]**

   a) Displacement has only magnitude and no specific direction
   b) The magnitude of the displacement is greater than the distance travelled by a moving object
   c) Displacement has magnitude as well as specific direction
   d) Displacement cannot be zero

3. Which of the following is the characteristic of distance travelled by an object? **[1]**

   a) It has only magnitude and no specific direction
   b) It has a magnitude as well as specific direction
   c) It can be zero
   d) The distance travelled by an object is less than the magnitude of the displacement of the object.

4. A body is said to be in rest when: **[1]**

   a) Its position doesn't change with time with respect to the observer.
   b) It's position changes with time w.r.t observer.
   c) The body moves in uniform motion, w.r.t observer.
   d) None of these.

5. In which of the following cases of motion, the distance moved and the magnitude of displacement are equal? **[1]**

   a) The earth is revolving around the Sun
   b) The pendulum is moving to and fro
   c) A car is moving on a straight road
   d) A car is moving in a circular path

6. A signal from a space ship reaches the ground in 5 minutes. What was the distance of the space ship from the ground station? The speed of the signal is 3×10^8 m/s. **[1]**

   a) 9×10^7 m
   b) 9×10^{10} m
   c) 9×10^6m
   d) 3×10^6 m

7. What is the slope of the body when it moves with uniform velocity? **[1]**

a) positive

b) zero

c) may be positive or negative

d) negative

8. If the velocity of a body is reducing, it is said to have **[1]**

a) Retardation

b) Both Negative acceleration and Retardation

c) Negative acceleration

d) Positive acceleration

9. A ball is thrown up with a velocity of 20 ms^{-1}. What is the time of flight, neglecting air resistance? **[1]**

a) 8 sec

b) 1 sec

c) 2 sec

d) 4 sec

10. Usha swims in a 90 m long pool. She covers 180 m in one minute going either way. The average velocity is: **[1]**

a) $30ms^{-1}$

b) zero

c) $180ms^{-1}$

d) $90ms^{-1}$

11. A car accelerates uniformly from 18 km/h to 36 km/h in 5 sec. The acceleration is **[1]**

a) 5 ms^{-1}

b) 1 ms^{-2}

c) 1 km/s^2

d) 216 ms^{-2}

12. For a uniformly accelerated body with initial and final velocities as u and v ms^{-1}, the average velocity is: **[1]**

a) $\frac{u - v}{2}$

b) $\frac{v}{2}$

c) $\frac{u + v}{2}$

d) $\frac{u}{2}$

13. Suppose a boy is enjoying a ride on a merry-go-round which is moving with a constant speed of $10ms^{-1}$. It implies that the boy is **[1]**

a) moving with no acceleration

b) at rest

c) in accelerated motion

d) moving with uniform velocity

14. The displacement of a body is proportional to the cube of the time lapsed. The magnitude of the acceleration is: **[1]**

a) decreasing with time

b) increasing with time

c) constant

d) zero

15. If a body starts from rest, what can be said about the acceleration of the body? **[1]**

a) Uniform accelerated

b) Positively accelerated

c) Negative accelerated

d) Non-Uniform accelerated

16. If a moving body comes to rest, then it's acceleration is: **[1]**

a) Negative

b) Positive

c) Constant

d) Zero

17. If the v-t graph is a straight line inclined to the time axis, then: **[1]**

a) a $\neq$ 0

b) a = constant $\neq$ 0

c) a $\neq$ constant $\neq$ 0

d) a = 0

18. **Assertion (A):** The speed of the car is constant, its velocity is not constant because the direction of the car is **[1]**

changing continuously.

Reason (R): The direction of velocity is the same as the direction of displacement of the body.

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

b) Both A and R are true but R is not the correct explanation of A.

c) A is true but R is false.

d) A is false but R is true.

19. **Assertion (A):** An object may acquire acceleration even if it is moving at a constant speed. **[1]**

Reason (R): With change in the direction of motion, an object can acquire acceleration.

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

b) Both A and R are true but R is not the correct explanation of A.

c) A is true but R is false.

d) A is false but R is true.

20. **Assertion (A):** A boy goes from A to B with a velocity of 20 m/min and comes back from B to A with a velocity of 30 m/min. The average velocity of the boy during the whole journey is zero. **[1]**

Reason (R): The ratio of speed to the magnitude of velocity when the body is moving in one direction is equal to one.

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

b) Both A and R are true but R is not the correct explanation of A.

c) A is true but R is false.

d) A is false but R is true.

21. **Assertion (A):** A car is said to have a uniform speed of say, 60 km per hour, if it travels 30 km every half hour, 15 km every quarter of an hour, 1 km every minute, and 1/60 km every second. **[1]**

Reason (R): The SI unit of speed is metres per second.

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

b) Both A and R are true but R is not the correct explanation of A.

c) A is true but R is false.

d) A is false but R is true.

22. **Assertion (A):** An object can have constant speed but variable velocity. **[1]**

Reason (R): Speed is a scalar but velocity is a vector quantity.

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

b) Both A and R are true but R is not the correct explanation of A.

c) A is true but R is false.

d) A is false but R is true.

23. **Assertion (A):** A tiger can accelerate from rest at the rate of 4 m/s^2. **[1]**

Reason (R): The velocity attained by it in 10s is 40 m/s.

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

b) Both A and R are true but R is not the correct explanation of A.

c) A is true but R is false.

d) A is false but R is true.

24. **Assertion (A):** Motion with uniform velocity is always along a straight-line path. **[1]**

Reason (R): In uniform velocity a motion, speed is the magnitude of the velocity and is equal to the instantaneous velocity.

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

b) Both A and R are true but R is not the correct explanation of A.

c) A is true but R is false.
d) A is false but R is true.

25. **Assertion (A):** Velocity versus time graph of a particle in uniform motion along a straight path is a line parallel to the time axis. **[1]**

Reason (B): In uniform motion the velocity of a particle increases as the square of the time elapsed.

a) Both A and R are true and R is the correct explanation of A.
b) Both A and R are true but R is not the correct explanation of A.
c) A is true but R is false.
d) A is false but R is true.

26. **Assertion (A):** An object may have acceleration even if it is moving with uniform velocity. **[1]**

Reason (B): An object may be moving with uniform velocity but it may be changing its direction of motion.

a) Both A and R are true and R is the correct explanation of A.
b) Both A and R are true but R is not the correct explanation of A.
c) A is true but R is false.
d) A is false but R is true.

27. **Assertion (A):** A bus moving due north takes a turn and starts moving towards the east with the same speed. There will be no change in the velocity of the bus. **[1]**

Reason (R): Velocity is a vector quantity.

a) Both A and R are true and R is the correct explanation of A.
b) Both A and R are true but R is not the correct explanation of A.
c) A is true but R is false.
d) A is false but R is true.

28. **Assertion (A):** The speedometer of an automobile measure the average speed of the automobile. **[1]**

Reason (R): Average velocity is equal to total displacement per total time-taken.

a) Both A and R are true and R is the correct explanation of A.
b) Both A and R are true but R is not the correct explanation of A.
c) A is true but R is false.
d) A is false but R is true.

29. **Assertion (A):** The speed or velocity of a car running on a crowded city, road changes continuously. **[1]**

Reason (R): The movement of a car on a crowded city road is an example of non-uniform acceleration.

a) Both A and R are true and R is the correct explanation of A.
b) Both A and R are true but R is not the correct explanation of A.
c) A is true but R is false.
d) A is false but R is true.

30. **Assertion (A):** A boy is enjoying a ride on a merry-go-round which is moving at a constant speed of 10 m/s. The boy is in uniform accelerated motion. **[1]**

Reason (R): A body has a uniform acceleration if it travels in a straight line and its velocity first decreases then increases by equal amounts in equal intervals of time.

a) Both A and R are true and R is the correct explanation of A.
b) Both A and R are true but R is not the correct explanation of A.
c) A is true but R is false.
d) A is false but R is true.

31. **Assertion (A):** When the displacement of a body is directly proportional to the square of the time. Then the body is moving with uniform acceleration. **[1]**

Reason (R): The slope of velocity-time graph with time axis gives acceleration.

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

b) Both A and R are true but R is not the correct explanation of A.

c) A is true but R is false.

d) A is false but R is true.

32. **Assertion (A):** Motion of satellites around their planets is considered as accelerated motion. **[1]**

Reason (R): During their motion, the speed remains constant, while the direction of motion changes continuously.

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

b) Both A and R are true but R is not the correct explanation of A.

c) A is true but R is false.

d) A is false but R is true.

33. **Fill in the blanks:** **[6]**

(a) A body is said to possess _____ if it travels in a straight line and its velocity increases or decreases by equal amounts in equal intervals of time. **[1]**

(b) Negative acceleration is called _____. **[1]**

(c) The acceleration is taken to be _____ if it is in the direction of velocity. **[1]**

(d) Acceleration is a _____ quantity. **[1]**

(e) _____ of a body is defined as the rate of change of its velocity with time. **[1]**

(f) The change in velocity of the object for any time interval is _____. **[1]**

34. The equation of motion is applicable for _____ acceleration motion. **[1]**

a) Uniformly

b) Non-uniformly

c) Variably

d) Zero

35. Starting from rest at the top of an inclined plane a body reaches the bottom of the inclined plane in 4 seconds. At what time does the body cover one fourth the distance starting from rest at the top? **[1]**

a) 3 second

b) 2 second

c) 1 second

d) 4 second

36. An object travels 16 m in 4 s and then another 16 m in 2 s. What is the average speed of the object? **[1]**

37. A plane has a take off speed of 88.3 m/s and requires 1365 m to reach that speed. Determine the acceleration of the plane and the time required to reach this speed. **[1]**

38. What is a reference point? **[1]**

39. When is an object in motion considered to be a point object? **[1]**

40. The reference point from which the distance of a body is measured is called? **[1]**

41. Under what condition will the displacement and distance have the same magnitude? **[1]**

42. What is essential to describe the position of an object? **[1]**

43. What does the odometer of an automobile measure? **[1]**

44. Which of the following is true for displacement? **[1]**

a. It cannot be zero.

b. Its magnitude is greater than the distance traveled by the object.

45. Define average velocity. **[1]**

46. Define the term "velocity". **[1]**

47. What does the path of an object look like when it is in uniform motion? **[1]**

48. What do you understand by a uniform velocity? **[1]**

49. What is the relation between linear velocity and angular velocity? **[1]**

50. State SI unit of acceleration. **[1]**

51. Give an example of non-uniform acceleration? **[1]**

52. What is negative acceleration? **[1]**

53. When is the acceleration taken as negative? **[1]**

54. What do you mean by positive acceleration? **[1]**

55. Define acceleration of a body. **[1]**

SAINIK SCHOOL KALIKIRI

SUMMER VACATION HOLIDAY HOMEWORK

ON ART AND CRAFT

CLASS IX

- **3 Portrait drawing human anatomy with pencil shading**
- **Any Craft module with any material**

Sainik School Kalikiri, Annamayya district, Andhra Pradesh

Geography Holiday Homework

Following essentials are required to be fulfilled for their preparation and submission:

- Select any one of the following projects.
- The total length of the projects will be 15 pages.
- The projects will be handwritten and credit will be awarded to original drawings, illustrations and creative use of materials.
- The project reports will be presented in a neatly bound simple folder.
- Bring the hard copy of the project when you are coming back to school after the completion of summer vacation
- The projects will be developed and presented in this order

  i) Cover page
  ii) List of contents
  iii) Acknowledgement
  iv) Project overview
  v) Chapters
  vi) Summary and conclusions
  vii) Bibliography

List of Projects

1) Managing disasters-The role of students.
2) Can disaster be prevented? Enumerate some of the ways through which impact of disasters can be reduced.
3) Floods: Examine its causes, typical effects and main mitigation strategies.
4) Road and rail accidents: Illustrate their causes, effects and main mitigation strategies.
5) Discuss the process of community planning for disasters.

SUMMER HOLIDAY HOME WORK

ग्रीष्मकालीन गृहकार्य 2024-25

कक्षा- नौवीं (हिन्दी)

क्रम संख्या	गृहकार्य का विषय
	व्याकरण
1	मुहावरों का अर्थ लिखकर वाक्य में प्रयोग करो। (25) लिखिए।
2	प्रत्यय शब्द (25) लिखिए।
3	उपसर्ग शब्द (25) लिखिए।
	पत्रलेखन
4	इंटरनेट पर इंटरनेट का भंडार है, लेकिन इसके प्रयोग में सावधानी बरतने से इसका प्रभाव सामने आने लगता है। इंटरनेट का प्रयोग सोच समझकर करने की सलाह देते हुए छोटे भाई को पत्र लिखिए।
5	नवीं कक्षा में हिंदी विषय के चयन के कारणों तथा आज के युग में हिंदी की उपयोगिता बताते हुए विदेश में रहने वाले मित्र/सखी को पत्र लिखिए।
	अनुच्छेद लेखन
6	"मेरी अविस्मरणीय यात्रा ***अथवा*** मैंने ग्रीष्मावकाश कैसे बिताया"- इस विषय पर अनुच्छेद लिखिए।
7	मोबाइल फोन संपत्ति और विपत्ति की तरह ही सुखद और दु:खद है- इस विषय पर अनुच्छेद लिखिए।
8	'बढ़ते उद्योग कटते वन' इस विषय पर अनुच्छेद लिखिए।
	संवाद लेखन
9	बढ़ती गरमी और कम होती वर्षा के बारे में दो मित्रों की बातचीत का संवाद-लेखन कीजिए।
10	कुछ छोटे बच्चे अधिकांश समय टी.वी. देखते रहते हैं। इसका दुष्परिणाम उन्हें भुगतना पड़ता है। इसी विषय पर दो महिलाओं के बीच हुई बातचीत को संवाद के रूप में लिखिए।

SAINIK SCHOOL KALIKIRI
SUMMER VACATION HOMEWORK
వేసవి సెలవుల ఇంటి పని (2024-25)

విషయం: తెలుగు తొమ్మిదో తరగతి

1	" ధర్మభోద " పాఠ్యభాగ సారాంశాన్ని, మీ సొంతమాటల్లో రాయండి .
2	"ఆదికవి నన్నయ" గురించి మీరు తెలుసుకున్న అంశాలను రాయండి .
3	మీకు నచ్చిన కవిని గురించి ఒక వ్యాసం రాయండి .
4	న్యాపతి సుబ్బారావు గురించి మీ సొంత మాటల్లో రాయండి
5	అ) మీ ఊరిలోని సామెతలను సేకరించుకొని మరియు రాసుకొని రావలెను. ఆ) వేమన శతక పద్యాలు /భాస్కర శతక పద్యాల్లోని పది పద్యాలను మరియు భావాలను కంఠస్థం చేసి ఒక్కసారి రాసుకొని రావాలి .
6	ఈ క్రింది అంశాలపై రెండు వందల పదాల్లో వ్యాసములు రాయండి . అ) మాతృభాష ప్రాముఖ్యం ఆ) లలిత కళలు ఇ) విద్యార్థులు – రాజకీయాలు ఈ)గ్రంథాలయాలు ఉ) కృతిమ మేధస్సు (ARTIFICIAL INTELIGENCE)

	ఊ) గ్లోబల్ వార్మింగ్ (global warming; "భూగోళ/ప్రపంచ కవోష్ణత"

SAINIK SCHOOL KALIKIRI

LEARN TO LEAD (CBSE AFFIL: 180019)

HOLIDAY HOME WORK

Class: IX **Sub: Social Science**

Task: Subject Enrichment Activity/ Inter disciplinary Art Integrated project

Topic: Forest Society and Colonialism

- Compare the forest situations prevailed at pre- colonial, colonial and post- colonial era.
- Evaluate the growth &role of commercial forestry in different types of Vegetation.
- To defend the role of government and the local communities in protecting the forest cover

Interdisciplinary Project.

1) Constructivism
2) Inquiry based learning
3) Cooperative learning
4) Learning station
5) Collaborative learning
6) Videos/ Visuals/ documentaries/ movie clippings
7) Carousel technique
8) Art integrated learning
9) Group Discussions

SAINIK SCHOOL KALIKIRI

ANNAMAYA - 517234

VACATION HOME WORK

Class 09 - Mathematics

1. The value of $\sqrt{p^{-1}q} \cdot \sqrt{q^{-1}r} \cdot \sqrt{r^{-1}p}$ is

a) -1

b) 1

c) 2

d) 0

2. If $\frac{5-\sqrt{3}}{2+\sqrt{3}} = x + y\sqrt{3}$, then

a) x = -13, y = - 7

b) x = 13, y = -7

c) x = -13, y = 7

d) x = 13, y = 7

3. On simplification $(3+\sqrt{3})(3-\sqrt{3})$ gives

a) 0

b) $-2\sqrt{3}$

c) 16

d) 6

4. A rational number equivalent to a rational number $\frac{7}{19}$ is

a) $\frac{17}{119}$

b) $\frac{21}{57}$

c) $\frac{14}{57}$

d) $\frac{21}{38}$

5. Select the CORRECT statement.

a) Between two rational numbers, there exist infinite number of integers.

b) Every integer is a whole number.

c) None of these

d) If x = $\frac{\sqrt{3}+1}{\sqrt{3}-1} + \frac{\sqrt{3}-1}{\sqrt{3}+1} + \frac{\sqrt{3}-2}{\sqrt{3}+2}$, then the value of $x^2 + \left(\frac{39}{x}\right)^2$ is 110.

6. The decimal form of $\frac{1}{999}$ is

a) 0.999

b) $0.\overline{001}$

c) $0.00\overline{1}$

d) $0.\overline{001}$

7. $8\sqrt{15} \div 2\sqrt{3}$

a) $2\sqrt{15}$

b) $4\sqrt{5}$

c) $2\sqrt{5}$

d) $4\sqrt{15}$

8. The two irrational numbers between $\sqrt{2}$ and $\sqrt{3}$ are

a) 1.3010010001……. And 1.601001000100001……

b) 1.30100101……. And 1.6010010101……

c) 1.5010010001……. And

d) 1.5010010001……. And

1.601001000100001…… 1.801001000100001……

9. Which of the following numbers can be represented as non-terminating, repeating decimals?

a) $\frac{137}{25}$ b) $\frac{3}{16}$

c) $\frac{39}{24}$ d) $\frac{3}{11}$

10. The greater number among $\sqrt{17}-\sqrt{12}$ and $\sqrt{11}-\sqrt{6}$ is _____.

a) Can't be compared b) $\sqrt{17}-\sqrt{12}$

c) $\sqrt{11}-\sqrt{6}$ d) Both $\sqrt{17}-\sqrt{12}$ and $\sqrt{11}-\sqrt{6}$ are equal

11. If $10^x = 64$, what is the value of $10^{\frac{x}{2}+1}$?

a) 18 b) 80

c) 81 d) 42

12. The simplest rationalisation factor of $(2\sqrt{2}-\sqrt{3})$ is

a) $\sqrt{2}+\sqrt{3}$ b) $2\sqrt{2}+\sqrt{3}$

c) $2\sqrt{2}+3$ d) $\sqrt{2}-\sqrt{3}$

13. If, $x=\frac{a-b}{a+b}$, $y=\frac{b-c}{b+c}$, $z=\frac{c-a}{c+a}$ then the value of $\frac{(1+x)(1+y)(1+z)}{(1-x)(1-y)(1-z)}$ is _____.

a) -1 b) 1

c) abc d) $a^2b^2c^2$

14. If $x^{\frac{1}{12}} = 49^{\frac{1}{24}}$, then the value of x is

a) 7 b) 12

c) 49 d) 2

15. The value of $\sqrt{3-2\sqrt{2}}$ is

a) $\sqrt{2}+\sqrt{1}$ b) $\sqrt{2}-\sqrt{1}$

c) $\sqrt{3}+\sqrt{2}$ d) $\sqrt{3}-\sqrt{2}$

16. If $\sqrt{2}$= 1.414 then $\sqrt{\frac{(\sqrt{2}-1)}{(\sqrt{2}+1)}}$ =?

a) 0.207 b) 0.621

c) 0.414 d) 2.414

17. If a = -2, b = -1, then $a^b - b^a$ is equal to

a) -1 b) 0.5

c) -2 d) -1.5

18. The simplest form of $1.\overline{6}$ is

a) $\frac{833}{500}$ b) $\frac{5}{3}$

c) $\frac{4}{3}$ d) $\frac{8}{5}$

19. Which of the following is the value $(\sqrt{11}-\sqrt{7})(\sqrt{11}+\sqrt{7})$?

a) $\sqrt{7}$ b) 4

c) $\sqrt{11}$ d) -4

20. Between two rational numbers

a) there are only rational numbers and no irrational number b) there are infinitely many rational numbers

c) there is exactly one rational number d) there is no rational number

21. Find the value: $\left(\frac{32}{243}\right)^{1/5}$
22. Insert a rational number and an irrational number between 0 and 0.1
23. Simplify $(27)^{2/3}$.
24. Find five rational numbers between 1 and 2.
25. Divide $15\sqrt{15}$ and $3\sqrt{5}$.
26. Find the values of a and b in each of $\frac{3-\sqrt{5}}{3+2\sqrt{5}} = a\sqrt{5} - \frac{b}{11}$
27. Find the decimal expansion of $\frac{1}{7}$. Can you predict what the decimal expansions of $\frac{2}{7}, \frac{3}{7}, \frac{4}{7}, \frac{5}{7}, \frac{6}{7}$ are, without actually doing the long division? If so, how?
28. Find the values of a and b in each of $\frac{5+2\sqrt{3}}{7+4\sqrt{3}} = a - 6\sqrt{3}$
29. Rationalise the denominator: $\frac{1}{\sqrt{7}+\sqrt{6}-\sqrt{13}}$
30. If $a = xy^{p-1}$, $b = xy^{q-1}$ and $c = xy^{r-1}$, prove that $a^{q-r}\, b^{r-p}\, c^{p-q} = 1$
31. If $x = \frac{\sqrt{2}+1}{\sqrt{2}-1}$ and $y = \frac{\sqrt{2}-1}{\sqrt{2}+1}$ find the value of $x^2 + y^2 + xy$.
32. Prove that 1.101001000100001... is an irrational number.
33. Express: $2.0\overline{15}$ in the $\frac{p}{q}$ form, where p and q are integers and $q \neq 0$.
34. Represent $\sqrt{4.5}$ on the number line.
35. Find the values of a and b $\frac{7+\sqrt{5}}{7-\sqrt{5}} - \frac{7-\sqrt{5}}{7+\sqrt{5}} = a + \frac{7}{11}\sqrt{5}b$
36. If the polynomial $x^3 - 6x^2 + ax + 3$ leaves a remainder 7 when divided by (x - 1), then the value of **a** is

a) 7 b) 9

c) 0 d) 8

37. If x + 1 is a factor of the polynomial $2x^2 + kx$, then k =

a) -3 b) 4

c) -2 d) 2

38. The degree of a biquadratic polynomial is

a) 2 b) 4

c) 3 d) 1

39. If $(x + y)^3 - (x - y)^3 - 6y(x^2 - y^2) = ky^3$, then k =

a) 8 b) 2

c) 1 d) 4

40. The value of $x^3 + y^3 + 15xy - 125$ when x + y = 5 is

a) 0 b) 3

c) 1 d) 2

41. The value of $\frac{(a^2-b^2)^3+(b^2-c^2)^3+(c^2-a^2)^3}{(a-b)^3+(b-c)^3+(c-a)^3}$ is

a) 3(a - b)(b - c)(c - a)

b) (a + b)(b + c)(c + a)

c) 3(a + b)(b + c)(c + a)(a - b)(b - c)(c - a)

d) 2(a - b)(b - c)(c - a)

42. The factors of a^2 - 1 - 2x - x^2, are

a) (a - x - 1) (a + x - 1)

b) (a + x - 1) (a - x + 1)

c) (a + x + 1) (a - x - 1)

d) (a - x + 1) (a - x - 1)

43. $x + 1$ is a factor of the polynomial

a) $x^3 + 2x^2 - x - 2$

b) $x^3 + 2x^2 - x + 2$

c) $x^3 - 2x^2 + x + 2$

d) $x^3 + 2x^2 + x - 2$

44. The degree of the zero polynomial is

a) 0

b) any natural number

c) 1

d) not defined

45. $4a^2 + b^2 + 4ab + 8a + 4b + 4 = ?$

a) $(a + 2b - 2)^2$

b) $(2a + b + 2)^2$

c) $(a + 2b + 2)^2$

d) $(2a - b + 2)^2$

46. The zeroes of the polynomial $3x^2 + 11x - 4$ are

a) $\frac{1}{3}$, 4

b) $\frac{1}{2}$, -4

c) $\frac{1}{3}$, -4

d) $\frac{1}{4}$, -3

47. The coefficient of x^2 in $(2 - 3x^2)(x^2 - 5)$ is

a) 17

b) 1

c) -17

d) -10

48. The factors of x^2 - 9 is

a) (x - 3)(x - 3)

b) (x + 3)(x + 3)

c) (x + 3) (x - 3)

d) (x - 3)(x + 9)

49. The zero of the polynomial $(x - 2)^2 - (x + 2)^2$ is

a) 0

b) 2

c) 1

d) -2

50. If $x + \frac{1}{x} = 3$, then the value of $x^2 + \frac{1}{x^2}$ is

a) 0

b) 7

c) 1

d) 9

51. If both (x + 2) and (2x + 1) are factors of $ax^2 + 2x + b$, then the value of a - b is

a) -1

b) 2

c) 1

d) 0

52. Which of the following is a true statement?

a) $5x^3$ is a monomial

b) $x^2 + 5x - 3$ is a linear polynomial

c) x + 1 is a monomial

d) $x^2 + 4x - 1$ is a binomial

53. If x + 2 and x -1 are the factors of $x^3 + 10x^2 + mx + n$, then the values of m and n are respectively.

a) 5 and - 3

b) 17 and - 8

c) 23 and -19

d) 7 and - 18

54. If x-1 is the factor of p(x) = $x^3 - 23x^2 + kx - 120$, then the value of 'k' is

a) 120

b) 124

c) 142

d) 140

55. If $x^{51} + 51$ is divided by x + 1, then the remainder is

a) 0

b) 51

c) 50

d) 1

56. Classify as linear, quadratic or cubic polynomial: $3x^3$

57. Is the expression $x^{10} + y^3 + t^{50}$, polynomial in one variable or not? State the reason for your answer.

58. Factorize the using appropriate identity: $x^2 - \frac{y^2}{100}$

59. Factorise: $15x^2$ - x - 28.

60. Write the constant term in $\frac{\pi}{2}x^2 + 7x - \frac{2}{5}\pi$

61. Expand: $\left(\frac{1}{2}a - \frac{1}{4}b + 2\right)^2$.

62. Factorise: x^2 + xy - 2xz - 2yz

63. Is the expression $y^2 + \sqrt{2}$, polynomial in one variable or not? State the reason for your answer.

64. Factorise: 40 + 3x - x^2.

65. Factorise: a^2 + 2ab + b^2 - $9c^2$.

66. The polynomial p(x) = x^4 - $2x^3$ + $3x^2$ - ax + 3a - 7 when divided by x + 1 leave remainder 19. Find the remainder when p(x) is divided by x + 2.

67. Prove that $(a + b + c)^3 - a^3 - b^3 - c^3 = 3(a + b)(b + c)(c + a)$

68. Find the values of p and q so that x^4 + px^3 + $2x^2$ − 3x + q is divisible by (x^2 - 1)

69. Using factor theorem, factorize the polynomial: x^4 + $10x^3$ + $35x^2$ + 50x + 24

70. Divide p(x) by g(x), where p(x) = x + $3x^2$ – 1 and g(x) = 1 + x

71. Find the values of m and n so that the polynomial $x^3 - mx^2 - 13x + n$ has x-1 and x+3 as factors.

72. Find rational roots of the polynomial f (x) = $2x^3$ + x^2 - 7x - 6.

73. The polynomial $p(x) = x^4 - 2x^3 + 3x^2 - ax + 3a - 7$ when divided by x + 1 leave 19 as remainder. Also, find the remainder when p(x) is divided by x + 2.

74. If a + b + c = 5 and ab + bc + ca = 10, then prove that $a^3 + b^3 + c^3 - 3abc = -25$

75. If (x^3 + ax^2 + bx + 6) has (x - 2) as a factor and leaves a remainder 3 when divided by (x - 3), find the values of a and b.

SAINIK SCHOOL KALIKIRI

ACADEMIC YEAR – 2024-25

HOLIDAY HOMEWORK - CLASS 9 – ENGLISH

1. Prepare a pocket dictionary for referring new words of the first five chapters of prose, poetry and supplementary reader.

2. Capture any five beautiful moments of your summer vacation. Paste the photos on word document and write a few lines describing each moment. Convert the document to pdf.

3. Prepare a power point presentation on future schools based on the chapter ‘The Fun They Had’.

4. Read newspaper every day to enrich vocabulary and language skills.

* Submit 2 and 3 at hari@sskal.ac.in

HOLIDAY HOMEWORK

CLASS IX

SUBJECT : SCIENCE (BIOLOGY & CHEMISTRY)

BIOLOGY :

1. Prepare any model of your choice on any cell organelle and its functions.

   (or)

   Prepare PPT on cell structure and function.

2. Prepare creative poster on any of environmental problems.

   Ex : Air Pollution

3. Complete the class work.

4. Prepare the concept map on cell structure and function.

CHEMISTRY :

1. Differentiate any five properties of solids, liquids and gases.
2. What is meant by evaporation? Explain the factors affecting evaporation?
3. Define latent heat of fusion and latent heat of vaporization.
4. Give reasons for the following
   (a) Naphthalene balls disappear with time without leaving any solid.
   (b) We can get smell of perfume sitting several meters away.
   (c) Water at room temperature is a liquid
   (d) An iron almirah is a solid at a room temperature.
   (e) A gas exerts pressure on the wall of the container.
5. (a) Write the characteristics of particles of matter.
   (b) Draw the triangular diagram for the interconversion of three states of matter.

SAINIK SCHOOL KALIKIRI

SUMMER VACATION HOLIDAY HOMEWORK

ON ART AND CRAFT

CLASS VIII

- **3 Paintings and 2 drawing with pencil/color**
- **Any Craft module using cardboard**
- **Craft module using paper/scrap/any material**

SUMMER HOLIDAY HOME WORK

ग्रीष्मकालीन गृहकार्य 2024-25

कक्षा- आठवी

विषय : हिन्दी (हायर)

क्रम संख्या	गृहकार्य का विषय
	व्याकरण
1	प्रत्यय शब्द -20, उपसर्ग शब्द - 20 लिखिए।
2	संधि और उसके प्रकार उदाहरण सहित लिखिए।
3	समास और उसके प्रकार उदाहरण सहित लिखिए।
4	मुहावरे एवं लोकोक्तियाँ - 30 लिखिए।
	पत्रलेखन
5	अपने विद्यालय में खेल सामग्री मँगवाने के लिए अपने प्राचार्य महोदय को एक पत्र लिखिए।
6	अपने छोटे भाई को खेल/योगा के महत्व पर प्रकाश डालते हुए एक पत्र लिखिए।
	निबंध लेखन
7	(1) मोबाइल से लाभ या हानी (2) ग्लोबल वार्मिंग
	विज्ञापन लेखन
8	* विराट मोबाइल फ़ोन बनाने वाली कंपनी के लिए एक विज्ञापन तैयार कीजिए। * 'रॉयल टेलीविज़न' बनाने वाली कंपनी के लिए विज्ञापन तैयार कीजिए।

SUMMER HOLIDAY HOME WORK

ग्रीष्मकालीन गृहकार्य 2024-25

कक्षा- आठवी

विषय : हिन्दी (लोअर)

क्रम संख्या	गृहकार्य का विषय
	व्याकरण
1	संज्ञा और उसके प्रकार उदाहरण सहित लिखिए।
2	सर्वनाम और उसके प्रकार उदाहरण सहित लिखिए।
3	विशेषण और उसके प्रकार उदाहरण सहित लिखिए।
4	* पर्यायवाची (Synonym) शब्द 25 लिखिए * विलोम (Antonyms) शब्द 25 लिखिए।
	पत्रलेखन / कहानी लेखन
5	पाँच दिन का अवकाश माँगते हुए प्राचार्य महोदय को एक पत्र लिखिए।
6	अपनी मनपसंद **कोई भी दो** कहानी (Story) लिखिए।

SAINIK SCHOOL KALIKIRI
SUMMER VACATION HOME WORK
వేసవి సెలవుల ఇంటి పని (2024-25)

Subject: Lower Telugu **Class – VIII**

1	**Write Telugu Alphabets.(Varnamala)**
2	**Write Telugu Guninthalu. (క to క్ష)**
3	**Write and learn ten vemana poems in telugu**
4	**Write about your family in Telugu Language.**
5	**Write about your school in Telugu Language.**
6.	**Write 1 to 50 number names in Telugu Language.**

SAINIK SCHOOL KALIKIRI
SUMMER VACATION HOMEWORK
వేసవి సెలవుల ఇంటి పని (2024-25)

విషయం: తెలుగు ఎనిమిదో తరగతి

1	" **ఆంధ్ర వైభవం** " గేయం సారాంశాన్ని మీ సొంతమాటల్లో రాయండి .
2	" **కొండేపూడి లక్ష్మీనారాయణ**" గురించి మీరు తెలుసుకున్న అంశాలను రాయండి .
3	మీకు నచ్చిన కవిని గురించి ఒక వ్యాసం రాయండి .
4	మీకు నచ్చిన కవులు/రచయితల చిత్రపటంలను సేకరించి తీసుకొని రావలెను.
5	అ) మీరు చూసిన పల్లెటూరులోని మనుషుల మధ్య సంబంధాలు అక్కడి ప్రకృతి దృశ్యాలను వర్ణిస్తూ మీ మిత్రుని కి ఒక లేఖ రాయండి . ఆ) **వేమన శతక పద్యాలు / సుమతీ శతక పద్యాల్లోని** పది పద్యాలను మరియు భావాలను కంఠస్థం చేసి ఒక్కసారి రాసుకొని రావాలి .
6	అ) అక్షరమాలను రాయండి. ఆ) "**క**" నుండి " **క్ష** " గుణింతాలను రాయండి . ఇ) "**క**" నుండి " **క్ష** " ఒత్తులను ను రాయండి .

7	ఈ క్రింది అంశాలపై రెండు వందల పదాల్లో వ్యాసములు రాయండి . **అ) గ్రంథాలయాలు** **ఆ) కృతిమ మేధస్సు (ARTIFICIAL INTELIGENCE)** **ఇ) గ్లోబల్ వార్మింగ్ (global warming; "భూగోళ/ప్రపంచ కవోష్ణత**

Class VIII Computer Science Summer Vacation Holiday Homework:

As part of your summer vacation homework, enroll in the "Starting Python Programming" course available on Alison. Python is a widely used programming language with various applications in today's technology-driven world.

To enroll, please visit the following link: [Starting Python Programming Course](https://alison.com/course/starting-python-programming). This course is free of charge and is designed to introduce you to the basics of Python programming in an easy-to-understand manner, suitable for students at your level.

After completing the course, please submit a printout of your digital certificate. This will showcase your foundational understanding of Python programming, which is a valuable skill in the field of computer science.

Use this opportunity to enhance your programming skills and explore the exciting world of Python!

Wishing you a productive and enriching summer break!

SAINIK SCHOOL KALIKIRI
SUMMER VACATION HOLIDAY HOMEWORK
CLASS VIII – ENGLISH

S. N	Homework	What to Do?	How to do?
1	Verb Forms	Five verb forms of at least 200 verbs (other than Classwork)	Create a table with 5 columns named V1, V2, V3, V4, V5. List at least 200 verbs with their forms: 100 regular verbs (e.g., Play, played, played, playing, plays) and 100 irregular verbs (e.g., Eat, ate, eaten, eating, eats).
2	Phrasal Verbs	50 phrasal verbs, meaning, and usage	Select 50 phrasal verbs of your choice. Write their meanings and demonstrate their usage in sentences. You may refer to a dictionary for help.
3	Daily Report Writing	A small paragraph on 'How did I spend the day?'	Write a small paragraph in the past tense about how you spent each day, from 10 May to 10 June.
4	A Word – A Day	A new word, meaning, synonym, antonym, and usage	Each day from 10 May to 10 June, choose a new word and note its meaning, a synonym, an antonym, and how it is used in a sentence.
5	Review Writing	Favorite movie/program/cartoon/book reviews	Write a review of any two items listed (movie, program, cartoon, or book). Each review should have a word limit of 150 words.
6	Creative Story Writing	Your original story	Imagine you are writing a story for a movie you want to direct. Craft an original and engaging narrative.

Note: Please write your homework in a long, single-rule notebook, not on A4 sheets.

Dear Cadet,

I hope you are enjoying your time with family and friends during the vacation! While it's a time for relaxation, remember to help out at home and limit your screen time.

This homework is designed to keep you academically engaged and improve your English skills. Please approach it seriously and work on it daily, rather than trying to complete it all at once. Slow and steady progress is the key to success! Should you have any questions, feel free to call or WhatsApp me at the number below.

All the best! I look forward to seeing you after the vacation with your completed homework.

Thanks & Regards,

Ch Mary Babu
9959104160

SAINIK SCHOOL KALIKIRI

CHITTOOR - 517234

VACATION HOME WORK

Class 08 - Mathematics

Section A

1. $-\frac{2}{5} \times \left(-\frac{5}{2}\right)$ = _____.

a) 5
b) 2
c) $\frac{2}{5}$
d) 1

2. Which of the given is not true?

a) $\frac{2}{3} - \frac{5}{4} = \frac{5}{4} - \frac{2}{3}$
b) $\frac{2}{3} \times \frac{5}{4} = \frac{5}{4} \times \frac{2}{3}$
c) $\frac{2}{3} + \frac{5}{4} = \frac{5}{4} + \frac{2}{3}$
d) $\frac{2}{3} \div \frac{5}{4} = \frac{2}{3} \times \frac{4}{5}$

3. Three rational numbers lying between $\frac{-3}{4}$ and $\frac{1}{2}$ are

a) $\frac{-5}{4}, 0, \frac{1}{4}$
b) $\frac{-1}{4}, 0, \frac{1}{4}$
c) $\frac{-1}{4}, \frac{1}{4}, \frac{3}{4}$
d) $-\frac{1}{2}, 0, \frac{3}{4}$

4. Which of the following is not true?

a) Rational numbers are closed under multiplication
b) Rational numbers are closed under division
c) Rational numbers are closed under addition
d) Rational numbers are closed under subtraction

5. $0 \times \frac{15}{17}$ = _____.

a) 15
b) 0
c) 17
d) $\frac{15}{17}$

6. The numbers _____ and _____ are their own reciprocals.

a) 1, 2
b) 1, -1
c) 0, 1
d) –1, 0

7. Which of the following rational numbers is equal to its reciprocal?

a) $\frac{1}{2}$
b) 1
c) 0
d) 2

8. If a = 2 and b = 3, then value of $\left(\frac{1}{a} + \frac{1}{b}\right)^a$.

a) $\frac{75}{26}$
b) $\frac{24}{26}$
c) $\frac{25}{36}$
d) $\frac{25}{26}$

9. Multiplicative inverse of a negative rational number is:

a) 1

b) 0

c) a negative rational number

d) a positive rational number

10. One (1) is:

a) the identity for the subtraction of rational numbers

b) the identity for division of rational numbers

c) the identity for the addition of rational numbers

d) the identity for multiplication of rational numbers

Section B

11. $\frac{7}{11}$ of all the money in Hamid's bank account is ₹ 77000. How much money does Hamid have in his bank account?
12. Find the multiplicative inverse of -1.
13. From a rope 40 m long, pieces of equal size are cut. If the length of one piece is $\frac{10}{3}$m, find the number of such pieces.
14. By what numbers should we multiply $\frac{-8}{13}$ so that the product may be 24?
15. If 16 shirts of equal size can be made out of 24m of cloth, how much cloth is needed for making one shirt? (Decimal value)
16. Find using distributivity : $\left\{\frac{9}{16} \times \frac{4}{12}\right\} + \left\{\frac{9}{16} \times \frac{-3}{9}\right\}$.
17. A $117\frac{1}{3}$m long rope is cut into equal pieces measuring $7\frac{1}{3}$m each. How many such small pieces are these?
18. On a winter day the temperature at a place in Himachal Pradesh was -16°C. Convert it in degree Fahrenheit (°F) by using the formula $\frac{c}{5} = \frac{F-32}{9}$.
19. Which rational number does not have a reciprocal?
20. The reciprocal of –1 is _____.

Section C

21. Verify – (– x) = x for x = $\frac{3}{5}$
22. Verify the property x × y = y × x of rational numbers by using $x = \frac{-3}{8}$ and $y = \frac{-4}{9}$
23. Find $\frac{4}{7} \times \frac{14}{3} \div \frac{2}{3}$.
24. Find the product of additive inverse and multiplicative inverse of $\frac{-1}{3}$.
25. Verify the property x × y = y × x of rational number by using $x = \frac{2}{3}$ and $y = \frac{9}{4}$
26. Find: $\frac{1}{3} \times \frac{-5}{7} \times \frac{-21}{10}$
27. Simplify the expression by using the suitable property. Also, name the property.
    $\left[\frac{1}{2} \times \frac{1}{4}\right] + \left[\frac{1}{2} \times 6\right]$
28. Name the property used in the expression: $-\frac{2}{3} \times \left[\frac{3}{4} + \frac{-1}{2}\right] = \left[\frac{-2}{3} \times \frac{3}{4}\right] + \left[\frac{-2}{3} \times \frac{-1}{2}\right]$
29. Find the multiplicative inverse of $-1\frac{1}{8}$
30. Write the additive inverse of $\frac{2}{-9}$
31. A skirt that is $35\frac{7}{8}$cm long has a hem of $3\frac{1}{8}$cm. How long will the skirt be if the hem is let down?
32. Verify that – (– x) is the same as x for $x = \frac{13}{17}$.
33. Multiply $\frac{6}{13}$ by the reciprocal of $\frac{-7}{6}$.
34. By what numbers should we multiply $\frac{-8}{13}$ so that the product may be 24?
35. Verify the property x × (y × z) = (x × y) × z of rational number by using x = 1, y = $\frac{-1}{2}$ and $z = \frac{1}{4}$ and What is the name of this property?
36. Using suitable rearrangement find the sum: $-5 + \frac{7}{10} + \frac{3}{7} + (-3) + \frac{5}{14} + \frac{-4}{5}$
37. Verify the property x × (y × z) = (x × y) × z of rational number by using $x = \frac{2}{3}, y = \frac{-3}{7}$ and $z = \frac{1}{2}$ and What is the name of this property?

38. Write any 5 rational numbers between $\frac{-5}{6}$ and $\frac{7}{8}$.
39. $5\frac{1}{2}$m long rope is cut into 12 equal pieces. What is the length of each piece?
40. Write the additive inverse of $\frac{21}{112}$
41. Four friends had a competition to see how far could they hop on one foot. The table given shows the distance covered by each.

Name	Distance covered (in km)
Seema	$\frac{1}{25}$
Nancy	$\frac{1}{32}$
Megha	$\frac{1}{40}$
Soni	$\frac{1}{20}$

    a. How farther did Soni hop than Nancy?

    b. What is the total distance covered by Seema and Megha?

    c. Who walked farther, Nancy or Megha?

42. Simplify: $\left(-5 \times \frac{2}{15}\right) - \left(-6 \times \frac{2}{9}\right)$
43. Using appropriate properties find
    $-\frac{2}{3} \times \frac{3}{5} + \frac{5}{2} - \frac{3}{5} \times \frac{1}{6}$
44. Find 3 rational numbers between $\frac{-4}{3}$ and $\frac{-8}{7}$.
45. $\frac{1}{6}$ of the class students are above average, $\frac{1}{4}$ are average and rest are below average. If there are 48 students in all, how many students are below average in the class?
46. Verify commutative property of multiplication if x = 2 and $y = \frac{-7}{8}$.
47. Find 5 rational numbers between $\frac{-1}{3}$ and $\frac{4}{-5}$.
48. Let a, b, c be the three rational numbers where a = $\frac{2}{3}$, b = $\frac{4}{5}$ and c = $\frac{-5}{6}$ then verify that a $\times$ (b $\times$ c) = (a $\times$ b) $\times$ c (Associative property of multiplication)
49. Verify the property x $\times$ (y + z) = x $\times$ y + x $\times$ z of rational number where $x = \frac{-1}{5}, y = \frac{2}{15}$ and $z = \frac{-3}{10}$
50. Express $\frac{5}{-3} + \left(\frac{3}{-2}\right) + \left(\frac{-7}{3}\right) + 3$ as a rational number in $\frac{p}{q}$ form.
51. What will be the product of two rational numbers. Discuss your answer.
52. $\frac{2}{5}$ of total number of students of a school come by car while $\frac{1}{4}$ of students come by bus to school. All the other students walk to school, of which $\frac{1}{3}$ walk on their own and the rest are escorted by their parents. If 224 students come to school walking on their own, how many students study in that school?
53. The overall width in cm of several wide-screen televisions is 97.28 cm, $98\frac{4}{9}$cm, $98\frac{1}{25}$cm and 97.94 cm. Express these numbers as rational numbers in the form $\frac{p}{q}$ and arrange the widths in ascending order.
54. Find the additive inverse of zero.
55. Huma, Hubna and Seema received a total of ₹2016 as monthly allowance from their mother such that Seema gets $\frac{1}{2}$ of what Hubna gets and Huma gets $1\frac{2}{3}$ times Seema's share. How much money do the three sisters get individually?
56. The table shows the portion of some common materials that are recycled.

Material	Recycled
Paper	$\frac{5}{11}$
Aluminium cans	$\frac{5}{8}$
Glass	$\frac{2}{5}$

Scrap	$\frac{3}{4}$

a. Is the rational number expressing the amount of paper recycled more than $\frac{1}{2}$ or less than $\frac{1}{2}$?

b. Which items have a recycled amount less than $\frac{1}{2}$?

c. Is the quantity of aluminium cans recycled more (or less) than half of the quantity of aluminium cans?

d. Arrange the rate of recycling the materials from the greatest to the smallest.

57. Represent the rational numbers $\frac{-1}{4}$, $\frac{-7}{12}$ and $\frac{-5}{6}$ as points A, B and C on the number line.

58. Give one example each to show that the rational numbers are closed under addition, subtraction and multiplication. Are rational numbers closed under division? Give two examples in support of your answer.

59. Manavi and Kuber each receive an equal allowance. The table shows the fraction of their allowance each deposit into his/her saving account and the fraction each spends at the mall. If the allowance of each is ₹1260, find the amount left with each.

Where money goes	**Fraction of allowance**	
	Manavi	**Kuber**
Saving account	$\frac{1}{2}$	$\frac{1}{3}$
Spend at mall	$\frac{1}{4}$	$\frac{3}{5}$
Left over	?	?

60. Find 10 rational numbers between $\frac{7}{-9}$ and $\frac{-5}{8}$.

SAINIK SCHOOL KALIKIRI

LEARN TO LEAD (CBSE AFFIL: 180019)

Holiday Home Work

Class VIII **Sub: Social Science**

Task: Subject Enrichment Activity/ Art Integrated project

Topic: The Indian Constitution

- Key features of the Constitution.
- Background and challenges to make the Indian Constitution.
- Significant personalities involved in the making of the Indian Constitution.

Art integration project

Ex. Surveys / Interviews / Research work/ Observation/ Story based Presentation/ Art integration/ Quiz/ Debate/ role play/ viva, /group discussion, /visual expression/ interactive bulletin boards/ gallery walks/ exit cards/ concept maps/ peer assessment/ art integration /Self-

NCC Holiday Homework Instructions

To make the most of your NCC holiday homework, we've streamlined the process for you. Follow these steps to ensure you complete your tasks effectively:

Download the DGNCC Training App(i.e. https://play.google.com/store/apps/details?id=com.chl.ncc): Head over to the Google Play Store and install the DGNCC Training App on your device. This app is your gateway to accessing essential NCC training materials.

Navigate to "Presis": Once the app is installed, open it and click on the "Presis" section. Here, you'll find a range of resources tailored to your NCC training needs.

Access Junior Cadets Content: Within "Presis," locate the section dedicated to Junior Cadets. This is where you'll find content specifically designed for cadets like you.

Download "Common Subjects": Under the Junior Cadets section, look for the option to download "Common Subjects." This contains valuable material pertinent to your NCC training.

Explore Official NCC SD Common Subject Content: Once downloaded, delve into the official release of NCC SD Common Subject content. This material is curated to enrich your understanding of essential subjects.

Read and Summarize: Your task is to thoroughly read the common subject content. Choose any 15 chapters that pique your interest, and submit important headings from each chapter.

Remember, this holiday homework is not just about completing tasks but also about deepening your knowledge and understanding of NCC principles. Should you have any questions or encounter any difficulties, don't hesitate to reach out for assistance. (+91 7981070167 ANO S/O Jagdish Babu)

Best wishes for a productive holiday period!

Dept of NCC, Sainik School Kalikiri

SAINIK SCHOOL KALIKIRI
SUMMER VACATION HOLIDAY HOME WORK – 2024
SCIENCE - CLASS 8

SCIENTIFIC REPORT MAKING

1. Visit agriculture field and interact with a farmer about Agricultural practice and prepare a questionnaire. Write in A4 paper and submit a **report** with a photo.

POSTER MAKING

2. Prepare a Poster on the following topic **food preservatives/food poisoning.**

Mind Map

3. Prepare a mind map on the **benefits of microorganism daily life** with pictures/ diagrams – A4 size

HAPPY VACATION AND STAY SAFE

SAINIK SCHOOL KALIKIRI

SUMMER VACATION HOLIDAY HOMEWORK

ON ART AND CRAFT

CLASS VII

- **5 Pencil drawings and shading**

  (OR)
- **5 Paintings**
- **Any Craft module using cardboard**
- **Nature collage**

SUMMER HOLIDAY HOME WORK

ग्रीष्मकालीन गृहकार्य 2024-25

कक्षा- सातवी

विषय : हिन्दी (हायर)

क्रम संख्या	गृहकार्य का विषय
	व्याकरण
1	मुहावरों का अर्थ लिखकर वाक्य में प्रयोग करो। (20) लिखिए।
2	संज्ञा और उसके प्रकार उदाहरण सहित लिखिए।
3	सर्वनाम और उसके प्रकार उदाहरण सहित लिखिए।
4	विशेषण और उसके प्रकार उदाहरण सहित लिखिए।
5	पर्यायवाची शब्द (Synonyms words) (25) लिखिए। विलोम शब्द (Antonym words) (25) लिखिए।
	पत्रलेखन
6	अपने विद्यालय में खेल सामग्री मँगवाने के लिए अपने प्राचार्य महोदय को एक पत्र लिखिए।
7	अपने छोटे भाई को खेल/योगा के महत्व पर प्रकाश डालते हुए एक पत्र लिखिए।
	निबंध लेखन
8	(1) मोबाइल से लाभ या हानी (2) ग्लोबल वार्मिंग

SUMMER HOLIDAY HOME WORK

ग्रीष्मकालीन गृहकार्य 2024-25

कक्षा- सातवी

विषय : हिंदी (लोअर)

क्रम संख्या	गृहकार्य का विषय
1	सम्पूर्ण बारह खड़ी लिखिए।
2	वर्णमाला लिखिए- स्वर और व्यंजन
3	पक्षियों के नाम (Birds Name) 20 लिखिए।
4	पर्यायवाची शब्द (Synonyms)- 20 लिखिए।
5	विलोम शब्द (Opposite)- 20 लिखिए।
6	सब्जियों के नाम (Vegetables Name) 20 लिखिए।
7	फलों के नाम (Fruits Name) 20 लिखिए।
8	जानवरों के नाम (Animals Name) 20 लिखिए।
9	'मेरा प्रिय खेल' इस विषय पर अपने शब्दों में लिखिए।
10	अपनी मन पसंद **कोई भी दो** कहानी (Story) लिखिए।

SAINIK SCHOOL KALIKIRI
SUMMER VACATION HOMEWORK
వేసవి సెలవుల ఇంటి పని (2024-25)

Subject : Lower Telugu **Class-VII**

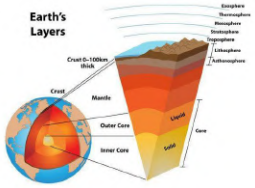
1	**Write the Telugu Alphabets.(Varnamala)**
2	**Write Telugu Guninthalu.(క to క్ష)**
3	**Write Telugu Othulu.(క to క్ష)**
4	**Write about yourself in ten sentences in Telugu Language.**
5	**Write** **a) Names of Any 20 Vegetables in Telugu Language.** **b) Names of Any 20 Fruits in Telugu Language.**
6	**Write the Names of any ten animals in Telugu Language.**
7.	**Write 1 to 30 number names in Telugu Language**

Social Science Holiday homework

Please make **Any two** of the following

Class - 7A/B

1. Write a detailed note on Chola Dynasty, Architecture, Agriculture and Irrigation system
   (10 Images in 5 A4 sheets)
   (10 pages content in A4 sheets, Handwritten)
2. Make a 3D model of earth and label the Interior part of the earth - Crust , Mantle and core.
   for Reference



3. Prepare a list and explain the popular struggles for equality around the world.
   (Any Five movements)
   (10 Images in 5 A4 sheets)
   (10 pages content in A4 sheets, Handwritten)

4 .Make a Video/vlog on Any place/Monuments / museums/ Forest/ Waterfalls/ Hills/ Any tourist place Which you are visiting during this Vacation. If you are not visiting any Place you Can make a vlog about your own Village/City. (**Please note : You have to visit with the parents, don't go on your own**)

SAINIK SCHOOL KALIKIRI
SUMMER VACATION HOMEWORK
వేసవి సెలవుల ఇంటి పని (2024-25)

విషయం: తెలుగు **ఏడవ తరగతి**

1	“ అక్షరం” గేయం సారాంశాన్ని మీ సొంతమాటల్లో రాయండి .
2	“ **రావినూతల ప్రేమకిషోర్** ” గురించి మీరు తెలుసుకున్న అంశాలను రాయండి .
3	“**మాయకంబళి**” కథా సారాంశాన్ని మీ సొంతమాటల్లో రాయండి .
4	“**గుట్టం జాషువా**” గురించి రాయండి.
5	అ) “**తాళ్ళపాక అన్నమాచార్యులు** ” గురించి మీరు తెలుసుకున్న అంశాలను రాయండి .
6	అ) అక్షరమాలను రాయండి. ఆ)‘ **క** ’ నుండి “ **క్ష** “ గుణింతాలును రాయండి . ఇ)‘ **క** ’ నుండి “ **క్ష** “ ఒత్తులను ను రాయండి .

7	ఈ క్రింది అంశాలపై రెండువందల పదాల్లో వ్యాసములు రాయండి . అ) **తెలుగు భాష గొప్పదనం** ఆ) **భారతదేశం గొప్పదనం** ఇ) **వార్తా పత్రికలు**

SAINIK SCHOOL KALIKIRI

CLASS – 7 SUMMER HOLIDAY HOMEWORK

2024-2025

NOTE-

1. All questions are compulsory.
2. Practice with cubes up to 20, squares up to 30, and tables up to 30.

Q1. Which of the following statements is not true? Give reason.

(a) When two positive integers are added, we always get a positive integer.

(b) When two negative integers are added we always get a negative integer.

(c) When a positive integer and a negative integer is added we always get a negative integer.

(d) Additive inverse of an integer 2 is (– 2) and additive inverse of (– 2) is 2.

Q2. (– 11) × 7 is not equal to

(a) 11 × (– 7) **(b) – (11 × 7)**

(c) (– 11) × (– 7) **(d) 7 × (– 11)**

Q3. Which of the following is the multiplicative identity for an integer a?

(a) a **(b) 1** **(c) 0** **(d) – 1**

Q4. . If a and b are two integers, then which of the following may not be an integer? Give example.

(a) a + b **(b) a – b** **(c) a × b** **(d) a ÷ b**

Q5. (–a) + b = b + Additive inverse of _____

Q6. [(–8) + _____] + _____ = _____ + [(–3) + _____] = –3

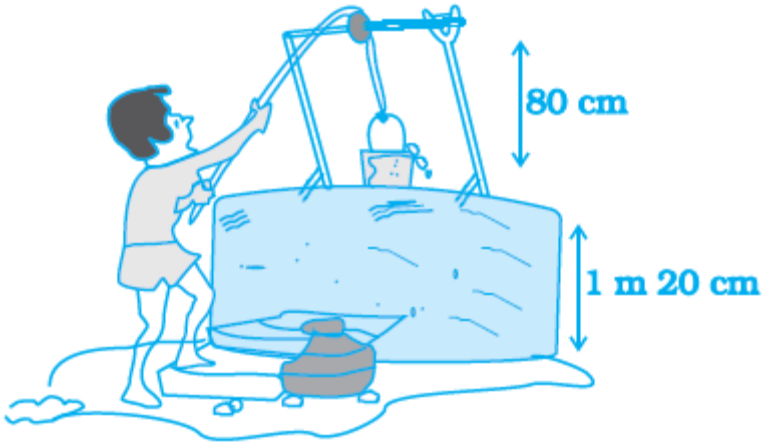
Q7. (– 23) × (42) = (– 42) × ____

Q8. [12 × (– 7)] × 5 = ___ × [(– 7) × ___]

Q9. 23 × (– 99) = ___ × (– 100 + ___) = 23 × ___ + 23 × ___

Q10. When we divide a negative integer by a positive integer, we divide them as whole numbers and put a _____ sign before quotient.

Q11. Water level in a well was 20m below ground level. During rainy season, rain water collected in different water tanks was drained into the well and the water level rises 5 m above the previous level. The wall of the well is 1m 20 cm high and a pulley is fixed at a height of 80 cm. Raghu wants to draw water from the well. The minimum length of the rope that he can use is

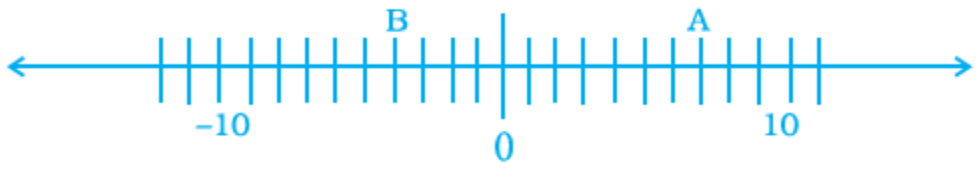


(a) 17 m (b) 18 m (c) 96 m (d) 97 m

Q12. On the following number line value 'Zero' is shown by the point

(a) X (b) Y (c) Z (d) W

Q13. By observing the number line state which of the following statements is not true. Give reason also.



(a) B is greater than –10 (b) A is greater than 0

(c) B is greater than A (d) B is smaller than 0

Q12. Solve the fractions.

(a) 3 – 7/4

(b) -2 + 3/8

(c) -17 – 8/17

(d) 12 +3/9

Q13. In a "magic square", the sum of the numbers in each row, in each column and along the diagonals is the same. Is this a magic square?

4/11	9/11	2/11
3/11	5/11	7/11
8/11	1/11	6/11

Q14. Nisha ate (3/5) part of an apple and the remaining apple was eaten by her brother Ravi. What part of the apple did Ravi eat? Who had the larger share? By how much?

Q15. **Michael finished colouring a picture in (7/12) hour. Vaibhav finished colouring the same picture in (3/4) hour. Who worked longer? By what fraction was it longer?**

Q16. **Vidya and Pratap went for a picnic. Their mother gave them a water bottle that contained 5 liters water. Vidya consumed 2/5 of the water. Pratap consumed the remaining water.**

(i) How much water did Vidya drink?

(ii) What fraction of the total quantity of water did Pratap drink?

Q17. **A vehicle covers a distance of 43.2 km in 2.4 litres of petrol. How much distance will it cover in one litre of petrol?**

Q18. **A two-wheeler covers a distance of 55.3 km in one litre of petrol. How much distance will it cover in 10 litres of petrol?**

Q19. **Find the area of rectangle whose length is 5.7cm and breadth is 3 cm.**

Q20. **Find the area of rectangle whose length is 3.4cm and breadth is 2 m.**

Class VII Computer Science Summer Vacation Holiday Homework:

Register for the "Internet and Social Media Safety" course available on Alison. This course is designed to equip you with essential knowledge about online threats and safety measures.

To enroll, please visit the following link: [Internet and Social Media Safety Course](https://alison.com/course/internet-and-social-media-safety). The course is free of charge and the content is presented in a clear and understandable manner, making it suitable for students at your level.

Upon completion of the course, kindly submit a printout of your digital certificate after the vacation.

By completing this course, you will gain fundamental awareness of internet threats and safety protocols, empowering you to navigate the online world responsibly.

Remember, it's not just about staying safe yourself; it's also about educating your friends and families to ensure their online safety as well.

Wishing you a safe and educational summer break!

SAINIK SCHOOL KALIKIRI

ACADEMIC YEAR – 2024-25

HOLIDAY HOMEWORK - CLASS 7 – ENGLISH

1. Prepare a pocket dictionary for referring new words of the first five chapters of prose, poetry and supplementary reader.

2. Capture any five beautiful moments of your summer vacation. Paste the photos on A4 sheet and write a few lines describing each moment.

3. Learn an idiom a day. Write the meaning and sentence usage of the idiom.

4. Read newspaper every day to enrich vocabulary and language skills.

SAINIK SCHOOL KALIKIRI

ACADEMIC YEAR: 2024-25

VII SCI HOLIDAY HOMEWORK

1. Attempt any 2-project work from the following:

(a) Create an infographic that combines scientific data on climate change with artistic elements. You can illustrate concepts like greenhouse gas emissions, the melting of polar ice caps, or the impact of deforestation, using visually appealing graphics and artwork.

(b) Any advanced technologies/ scientific phenomena through art.

(c) Prepare any one science illusion diagram (colorful or black-white)

(d) You can contribute to the beautification of your community and the preservation of the environment by taking initiative of plantation. Take a photo of yourself with the newly planted sapling and share it to your science teacher through WhatsApp (9903428237)

2. Prepare any one science model from given below:

- Rubber Band Car
- Making of Electromagnet

- Simple circuit working model
- Make Kaleidoscope
- Any other project from your science book.

3. Here's a list of a few good Indian films that are motivating and insightful. You are suggested to watch a few films from the list and make at least one drawing/sketch inspired by them..

Swades: Directed by Ashutosh Gowariker, this drama stars Shah Rukh Khan as an NRI who returns to India and becomes involved in rural development projects.
Taare Zameen Par - Directed by Aamir Khan, this film explores the story of a dyslexic child and his struggles within the Indian education system.
Lagaan - Directed by Ashutosh Gowariker, this epic sports drama set during the British Raj in India revolves around a group of villagers who challenge British colonizers to a game of cricket to avoid paying taxes.
Dangal - Based on the true story of wrestler Mahavir Singh Phogat, this film directed by Nitesh Tiwari highlights gender equality and the empowerment of women through sports.
Peranbu - Directed by Ram, this drama stars Mammootty and explores the complexities of parenting and unconditional love through the story of a father raising his differently-abled daughter.
Kumbalangi Nights - Directed by Madhu C. Narayanan, this coming-of-age drama follows the lives of four brothers in a dysfunctional family, exploring themes of masculinity, brotherhood, and emotional vulnerability.
Kakka Muttai (The Crow's Egg) - Directed by M. Manikandan, this heartwarming film follows the adventures of two young brothers from a Chennai slum who are determined to taste pizza for the first time.
Prithvi- The actor plays a tough government official in the Kannada film *Prithvi* who is out to bring to book corrupt officials and industrialists.

4. Having role models in student life is incredibly important for several reasons. Overall, role models play a crucial role in shaping the values, aspirations, and behaviors of students, helping them develop into confident, capable, and compassionate individuals.

Write a brief note on your role model and describe his/her influence on your life.