Carmel Convent School, Jammu

SUMMER HOLIDAY HOMEWORK
CLASS XII (SCIENCE STREAM)
(2023-2024)

"Learning should be joyful and full of excitement. It's life's greatest adventure an illustrated adventure into the minds of the noble and the learned."

Subject	Holiday Home Work (Summer Vacation)
Physics	**(Assignment A)** • Study the chapter 'Electromagnetic Waves' in details. • Sources of EM waves (b) Uses of EM Waves (c) Propagation of EM waves (d) Frequency and Wavelength range of EM waves (e) Displacement Current (f)Modified Ampere's Circuital law • Prepare your notes and solve the in text exercises. • Prepare practical file Write all the experiments in practical notebook given below: **Section A** 1. To determine resistance per cm of a given wire by plotting a graph of potential difference versus current. 2. To find resistance of a given wire using metre bridge and hence determine the resistivity (specific resistance) of its material. 3. To verify the laws of combination (series and parallel) of resistances using a metre bridge. 4. To compare the EMF of two given primary cells using potentiometer. 5. To determine the internal resistance of a given primary cell using potentiometer. 6. To determine resistance of a galvanometer by half-deflection method and to find its figure of merit. **Section B** 1. To find the value of v for different values of u in case of a concave mirror and to find the focal length.

	2. To find the focal length of a convex lens by plotting graphs between u and v or between 1/u and 1/v. 3. To determine angle of minimum deviation for a given prism by plotting a graph between angle of incidence and the angle of deviation. 4. To determine refractive index of a glass slab using a travelling microscope. 5. To draw the I-V characteristic curve of a p-n junction in forward bias and reverse bias. 6. To draw the characteristic curve of a Zener diode and to determine its reverse breakdown voltage. 7. To study the characteristics of a common emitter npn (or pnp) transistor and to find out the values of current and voltage gains.

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Physics	(Assignment) **Project based** Prepare an Investigatory Project on any one of the following topics or any other topic of your choice based on the concept of Physics (as per CBSE guidelines). **POINTERS FOR MAKING PROJECT REPORT** The material should be placed and bound in the following order: 1. Top Sheet of transparent plastic –The top page of your report should carry the following information in printed form or handwritten in neat block letters: **Title of Project:** **Name of Student:** **Roll Number:** 2. Aim of Project 3. Apparatus Required 4. Principle/Theory 5. Construction with Labeled Diagram 6. Working 7. Observations

	8. Calculations 9. Result/ Conclusions 10. Applications / Future scope 11. Graph if any 12. References/Bibliography 13. Back cover of plastic: may be opaque or transparent

Chemistry

Holiday Homework (2023-24)

Subject	Holiday Home Work (Summer Vacation)
Chemistry	(Assignment A) **SOLUTION** 1. Calculate the mole fraction of water in a mixture consisting of 9.0 water, 120 g acetic acid, ana 115 g ethyl alalcohol. 2. The density of a 2.0 M solution of acetic acid in water is 1.02 g/mL. Calculate the mole fraction of acetic acid. 3. The density of a 2.03 M solution of acetic acid in water is 1.017 g/mL. Calculate the molality of solution. 4. The molalityof a solution of ethyl alcohol in water is 1.54 mol/kg. How many grams of alcohol is dissolved in 2.50 kg water? 5. What is the mole fraction of the solute in a 1.00 m aqueous solution? 6. The given sample of sulphuric acid was found to have mole fraction of H_2 SO_4 as 0.15. Calculate the molality of solution. **7.** Concentrated nitric acid used in laboratory work is 68% nitric acid by mass in aqueous solution. What should be the molarity of such a sample of the acid if the density of the solution is 1.504 g mL^{-1}? 8 . A solution of glucose in water is labelled as 10% ”/”, what would be the molality and mole fraction of each component in the solution? If the density of solution is 1.2 gmL^{-1}, then what shall be the molarity of the solution?

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Chemistry	(Assignment B) Write the formulae andcolours of the following salts: 1. Potassium chromate 2. Potassium dichromate 3. Nickel chloride 4. Aluminium sulphate 5. Manganese sulphate 6. Lead acetate 7. Copper sulphate 8. Ferrous sulphate 9. Potassium permanganate
	(Assignment C) **Project based** ."The Chemistry of Medicines": Investigate the chemistry behind common medicines or drugs. Choose a specific medication (e.g., pain relievers, antibiotics, antacids) and research its chemical composition, mode of action, and potential side effects. Discuss the importance of dosage, drug interactions, and the role of chemistry in pharmaceutical development. Follow the given headings in the project: a) INTRODUCTORY PAGE b) CERTIFICATE c) ACKNOWLEDGEMENT d) INDEX/CONTENTS e) INTRODUCTION f) AIM g) OBSERVATIONS h) RESULT i) CONCLUSION j) BIBLIOGRAPHY

Biology

Subject	Holiday Home Work (Summer Vacation)
Biology	**Q1.**(a) Explain a monohybrid cross taking seed coat as a trait in *Pisum sativum*.Work out the cross upto F_2 generation. (b) State the laws of inheritance that can be derived from such a cross. (c) How is the phenotypic ratio of F_2 generation different in a dihybrid cross? **Q2.** Fertilization is essential for production of seed,but in some angiosperms seeds develop without fertilization.Give an example of an angiosperm that produces seeds without fertilization.Name the process Explain the two ways by which seeds develop without fertilization. **Q3.** (a) A DNA segment has a total of 1000 nucleotides, out of which 240 of them are adenine containing nucleotides. How many pyrimidine bases this DNA segment possesses?(Hint: A+G=C+T) (b) Draw a diagrammatic sketch of a portion of DNA to support your answer. Q4. Name the pollinating agents of flowers like maize, wheat, salvia and sunflower. Give characteristic features of these flowers. **Q5.**Make a project file on the topic GMO (Genetically Modified Organisms). Collect the data and record it in the given format: a) Index b)Acknowledgement c)Introduction d)Theory(Refer books and internet for this) e)Questionnaire/ Case studies f)Experience g)Conclusion h)Bibliography Do self study of chapter “Reproductive Health”. Study material of this chapter will be provided to you. There will be Unit-1 Exam chapter after the summer vacations.

Mathematics

Subject	Summer vacation Holidays Homework
Mathematics	Chapter :- Inverse Trigonometric functions Find the principal value of $\tan^{-1}(1)$. If $\tan^{-1}(x-1)/(x-2) + \tan^{-1}(x+1)/(x+2) = \pi/4$, then find the value of x. Solve: $\tan^{-1} 2x + \tan^{-1} 3x = \pi/4$ Find the value of $\cos^{-1}(1/2) + 2\sin^{-1}(1/2)$. Prove that $\sin^{-1}(3/5) - \sin^{-1}(8/17) = \cos^{-1}(84/85)$. Determine the principal value of $\cos^{-1}(-1/2)$. Find the value of $\cot(\tan^{-1}\alpha + \cot^{-1}\alpha)$. The value of $\tan^{-1}\sqrt{3} - \sec^{-1}(-2)$ is equal to: Chapter:- Matrices 1. If a matrix has 8 elements, what are the possible orders it can have. 2. Define square matrix 3. The no. of all possible metrics of order 3 × 3 with each entry 0 or 1 is 4. If A, B are symmetric matrices of same order, them AB – BA is a 5. If A and B are symmetric matrices of the same order, prove that AB + BA is symmetric 6. If A is any square matrix, prove that AA^1 is symmetric 7. find X $\begin{bmatrix}2 & -3\\1 & 1\end{bmatrix}\begin{bmatrix}x\\4\end{bmatrix}=\begin{bmatrix}1\\3\end{bmatrix}$ 8. Give example of matrices such that AB = 0, BA = 0, A ≠ 0, B ≠ 0 9. $A=\begin{bmatrix}0 & 1 & -1\\-1 & 0 & 1\\1 & -1 & 0\end{bmatrix}$ Show that , is skew symmetric matrix. 10. $\begin{bmatrix}x & y\\3y & x\end{bmatrix}\begin{bmatrix}1\\2\end{bmatrix}=\begin{bmatrix}3\\5\end{bmatrix}$ find x and y. 12. If A is a square matrix such that $A^2 = A$, then $(I + A)^3 - 7A$ is equal to 13. Construct a 3 × 4 matrix, whose element are given by aij = $\frac{1}{2}\lvert -3i + j \rvert$ **Chapter – Determinants** 1. Find the area of the triangle whose vertices are (3, 8), (– 4, 2) and (5, 1). 2. The monthly incomes of Aryan and Babban are in the ratio 3 : 4 and their monthly expenditures are in the ratio of 5 : 7. If each saves ? 15,000 per month, find their monthly incomes, using the matrix method. 3. solve the system of equations (CBSE. 2017): 2x+3y+10z=2 4x-6y+5z=5 6x+9y-20z=-4 Activity-1

	To draw the graph of 1 sin x − , using the graph of sin x and demonstrate the concept of mirror reflection (about the line y = x) Activity -2 To explore the principal value of the function sin–1x using a unit circle.

Physical education

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Physical education	1. Revise the chapter 1st and 2nd. 2. Practical, track and field (400 mtr.) Field and track events. 3. Play at home atleast 30 min. Daily to stay fit and healthy.

EVS

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EVS	Q: List all the wastes that you generate at home, school or during your trip to other places; could you very easily reduce? Which would be difficult or rather impossible to reduce? Q: a) A decade back, the enormous vehicular traffic in Delhi had made Delhi rank 4 th among most polluted cities of the world. Two measures taken by the Delhi government brought marked improvement in air quality by 2005.What are these two measures and how did they reduce air pollution? b) What is the norm set by Euro-II for petrol and diesel vehicles? Q: Public all over India is very much concerned about the deteriorating air quality in large parts of north India. Alarmed by this situation, the residents welfare association of your locality organized an awareness programme entitled “bury not burn”. They invited you being a biology student to participate. a) How would you justify your arguments that promote burying and discourage burning? b) With the help of flow charts, one for each practice, depict the chain of events that follow. Q: Make a project on any one topic given below: Waste Management/Wildlife conservation/Sewage treatment/Energy Conservation/Wetland Management. Collect the data and record it in the given format: A) Index B) Acknowledgement C) Introduction D) Theory(Refer books and internet for this) E) Questionnaire/ Case studies F) Experience G) Conclusion H) Bibliography Read the chapter - Soil Degradation Revise the chapter - Air pollution and Water pollution

Computer Science

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Computer Science	Prepare PowerPoint for below given topics: Networking and its advantages 1. Types of Networks: PAN, LAN, MAN, WAN 2. Transmission Media: Twisted pair cable, Coaxial cable, Optical fiber, Infra-Red, Satellite transmission. 3. Network Topologies: Bus, Star, Ring 4. Modem 5. Cyber safety and security Cyber Bullying: 1. Preventive Measures 2. Computer Safety and Security 3. Internal Safety and Ethics 4. Safe Social Networking 5. Safe Email Practices 6. Dos and Don'ts for Cyber Safety Practical Work: 1. Write a program to convert Temperature from Fahrenheit to centigrade and Vice-versa. 2. Write a program using a class to store the mark list of 5 and to print highest Marks and Average Marks. 3. Write a C++ program to calculate perimeter and area of a square whose side is 2.5 cm. 4. WAP to use Parameterized constructors. 5. WAP to calculate area of a circle, rectangle and square using Function Overloading.