GURUKUL INTERNATIONAL SCHOOL, Haldwani HOME WORK FOR SUMMER BREAK (2025-26)

Class- XII Science

ENGLISH

- Speaking
- 1 Prepare a 2 minutes video on the topic child labour under the following points
 - child labour- definition
 - causes of child labour in India
 - laws preventing child labour
 - conclusion

Case study

- 2 Charlie is clearly unhappy with his modern life characterised by insecurity fear and stress. He desires a simple more peaceful time and he finds this in his mental image of 1894 Galesburg.
 - i) How can you say that Charlie was trying a mental escape ?
 - ii) What type of life does Charlie desired for ?
 - iii) Why did Charlie feel that going to Galesburg will solve all his problems ?

3 Write an article on any one of the following

- i) video games promote violence
 - ii) Clean India Green India
 - iii) The power of positivity
- 4 **Read the following book and mention the important incidence in it also write the book review (any one)** Great expectations by Charles Dickens

I am Malala by Malala Yousafzai

- 5 Imagine one day you get an access to time machine and you can easily go to either past or future. Write about what are the changes you wish to do in the past and how are you going to break this news to your parents.
- 6 Ageing is a natural process. In the light of "My Mother at sixty six" what message is the poet conveying ?
- 7 According to Anees Jung, what is the mystery about wearing shoes ?

PHYSICS

- 1 Explain why electric field lines do not form closed loops, while magnetic field lines do.
- 2 A point charge +q is placed at the center of a spherical Gaussian surface. How would the electric flux through the surface change if
 - * The sphere is replaced by a cube of the same volume?
 - * A second point charge -q is placed inside the sphere?
 - * A second point charge +q is placed outside the sphere?
- 3 Why is it safer to be inside a car than under a tree during a lightning storm? Explain using the concept of electrostatic shielding.
- 4 Distinguish between electric potential and electric potential energy. Provide an analogy to explain the difference.
- 5 An electric dipole is placed in a uniform electric field. Under what conditions will the dipole experience (i) a net force.
- 6 Three charges -q, +Q, and -q are placed at equal distances on a straight line. If the potential energy of the system of these charges is zero, then what is the ratio Q/q?
- 7 Derive the expression for the electric potential due to an electric dipole at a point on its axial line and at a point on its equatorial line.
- 8 State Gauss's Law and use it to derive the expression for the electric field due to a uniformly charged infinite plane sheet.
- Derive the expression for the capacitance of a parallel plate capacitor with a dielectric slab of thickness t and dielectric constant K placed between the plates (where the distance between the plates is d and t < d).
 Have a productive summer and a great time tackling these problems! Let me know if you have any other questions.
 ii) a net torque? Can it experience both simultaneously?
- 10 Explain the role of a dielectric medium in increasing the capacitance of a parallel plate capacitor. How does polarization of the dielectric occur in an external electric field?
- 11 Two identical capacitors are charged to the same potential V. They are then connected in parallel. What is the potential difference across the combination? What is the total energy stored? Compare this with the sum of the initial energies stored in the individual capacitors. Explain any difference.
- 12 Three charges -q, +Q, and -q are placed at equal distances on a straight line. If the potential energy of the system of these charges is zero, then what is the ratio Q/q?
- 13 Derive the expression for the capacitance of a parallel plate capacitor with a dielectric slab of thickness t and dielectric constant K placed between the plates (where the distance between the plates is d and t < d). Have a productive summer and a great time tackling these problems! Let me know if you have any other questions.</p>

14 Case study based

Read the following source and answer any four out of the following questions:

Electric charge is the physical property of matter that causes it to experience a force when placed in an electromagnetic field. There are two types of charges positive and negative charges. Also, like charges repel each other whereas unlike charges attract each other.



- i) Charge on a body that carries 200 excess electrons is a) -3.2×10^{-18} C b) 3.2×10^{-18} C c) -3.2×10^{-17} C
- ii) Charge on a body that carries 10 excess electrons is a) -1.6×10^{-18} C b) 1.6×10^{-18} C c) 2.6×10^{-18} C d) 1.6×10^{-21} C
- iii) Mass of electron is a) 9.1×10^{-31} kg

³¹ kg b) 9.1×10^{-31} g c) 1.6×10^{-19} kg

- iv) A body is positively charged, it implies that
 - a) there is only a positive charge in the body.
 - b) there is positive as well as negative charge in the body but the positive charge is more than the negative charge.

d) 3.2×10^{-17} C

d) 1.6×10^{-19} g

- c) there is equally positive and negative charge in the body but the positive charge lies in the outer regions.
- d) the negative charge is displaced from its position.
- v) On rubbing, when one body gets positively charged and the other negatively charged, the electrons transferred from the positively charged body to the negatively charged body are
 - a) valence electrons only b) electrons of inner shells
 - c) both valence electrons and electrons of the inner shell. d) none of the above

CHEMISTRY

2

3

1 Read the passage and answer question a to d that follows.

The vapour pressure of solvent is lowered by the presence of non-volatile solute and this lowering of vapour pressure is governed by Raoult's law, according to which 'the relative lowering of vapour pressure of the solvent over a solution is equal to mole fraction of solute present in the solution. However in a binary solution if both the components are volatile then another form of Raoult's law is used. The partial vapour pressure of each component is directly proportional to their mole fraction. Solution which obeys Raoult's law over the entire range of concentration are called ideal solutions. Two types of deviations from Raoult's law are observed, positive and negative deviation.

- a) What type of solution is formed by ethanol and water ?
- b) What type of solution is formed by benzene and toluene ?
- c) Identify which liquid will have a higher vapour pressure at 90°C if the boiling point of two liquids A and B are 140°C and 180°C respectively.
- d) Why the vapour pressure of an aqueous solution of glucose is is lower than that of water?

Read the passage and answer question a) to d) that follows.

Oxidation –reduction reactions are commonly known as redox reactions. They involve transfer of electrons from one species to another. In a spontaneous reaction, energy is released which can be used to do useful work. The reaction is split into two half reactions. Two different container are used and a wire is used to drive the electrons from one side to the other and a Galvanic cell is created. It is an electrochemical cell that uses spontaneous redox reactions to generate electricity. A salt bridge also connects the two half cells. The reading of the voltmeter gives the cell potential or emf. If E°_{cell} is positive, the reaction is spontaneous and if it is negative, the reaction is non-spontaneous and is referred to as electrolytic cell. Electrolysis refers to the decomposition of a substance by an electric current.

- a) Is silver plate the anode or cathode in Zn- AgNO₃ cell ? What will happen if the salt bridge is removed ?
- b) When electrochemical cell does behaves like an electrolytic cell ?
- c) What will happen to the concentration of Zn^{2+} and Ag^{+} when $E_{cell} = 0$?
- d) Why conductivity of a solution does decreases with dilution?
- **Directions:** Q.no.3 and Q. no, 4 consists of two statements, one is Assertion and the other is Reason. Give answer **Assertion (A):** Mercury cell does not steady potential.
- **Reason** (**R**) : In the cell reaction, ions are not involved in solutions.

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

4

- Assertion (A): When NaCl is added to water a depression in freezing point is observed.
 - **Reason (R)** : The lowering in vapour pressure of a solution causes depression in freezing point.
 - 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 the A.
 - c) A is true but R is false.
 - d) A is false but R is true.
- 5 Calculate the molarity of each of the following solutions i) $30 \text{ g of } Co(NO_3)_2.6H_2O \text{ in } 4.3 \text{ L of solution.}$ (At. mass of Co = 58.7 u) ii) 30 mL of 0.5 M H₂SO₄ diluted to 500 mL.
- Calculate the emf of the cell in which the following reaction takes place 6
 - $Ni(s) + 2Ag^{+}(0.002 \text{ M}) \longrightarrow Ni^{2+}(0.160 \text{ M}) + 2Ag(s)$ [Given that E^0 cell = 1.05 V]
- Explain Kohlrausch's law of independent migration of ions. Mention any three applications of Kohlrausch's law. 7

8 **Define the following terms**

- a) Standard Hydrogen Electrode c) Henry's Law and its three applications
 - b) Osmosis and Osmotic pressure d) Raoult's Law
- e) Nernst Equation

- f) Lead storage cell
- h) Electrode reaction of Fuel cell
- g) Electrochemical theory of Rust 9 Write the Nernst equation and the EMF of the following cell at 298 K Mg(s) | Mg²⁺ (**0.001**M) || Cu²⁺ (**0.0001**M) | Cu(s) [Given, $E_{Mg}^{0}{}^{2+}{}_{Mg} = -2.37$ V, $E_{Cu}^{0}{}^{2+}{}_{Cu} = +0.34$ V]
- 10 The air is a mixture of a number of gases. The major components are oxygen and nitrogen with approximate proportion of 20 % is to 79 % by volume at 298 K. The water is in equilibrium with air at a pressure of 10 atm. At 298 K, if the Henry's law constants for oxygen and nitrogen are 3.30×10^7 mm and 6.51×10^7 mm respectively, calculate the composition of these gases in water.

MATHEMATICS

- Plot the graphs of inverse trigonometric functions, such as $\sin^{-1}(x)$, $\cos^{-1}(x)$, and $\tan^{-1}(x)$, and analyze their 1 properties.
- 2 Research and present real-life applications of inverse trigonometry, such as navigation, physics, or engineering.
- 3 Create a set of matrices and perform operations such as addition, subtraction, multiplication, and inverse.
- 4 Create a diagram to illustrate the concept of relations and functions, and identify the domain and range.

5 Find the principal values of the following

- $\sin^{-1}(1/2)$ i)
- ii) $\cos^{-1}(-1/2)$
- iii) $\tan^{-1}(1)$

Prove the following identities 6

- $\sin^{-1}(x) + \cos^{-1}(x) = \pi/2$ i)
- ii) $\tan^{-1}(x) + \tan^{-1}(1/x) = \pi/2$
- 7 Find the inverse of the following matrices
 - i) A = [[2, 1], [4, 3]]
 - ii) B = [[1, 2], [3, 4]]
- 8 Solve the following system of linear equations using matrices
 - i) 2x + 3y = 7
 - ii) x 2y = -3

9 Determine whether the following relations are reflexive, symmetric, and transitive

- $R = \{(a, b) : a = b\}$ i)
- ii) $R = \{(a, b) : a < b\}$

BIOLOGY

Read the following case study and answer the given case based questions in your Biology notebook. 1 Case study:

Over population causes number of family problems. Strategies like birth control methods help to control population explosion. Natural methods of birth control do not involve medications or devices to prevent pregnancy but rather rely on behavioural practices or making observations about menstrual cycle.

Case based Questions.

- Which method helps in contraception by temporary absence of coitus? i)
 - a) Coitus interruptus b) Withdrawal method c) Rhythm method d) Lactational amenorrhea method

- ii) Assertion (A): The effectiveness of coitus interruptus method is limited.
 - **Reason** (\mathbf{R}) : Some sperms may pass into vagina before ejaculation.
 - a) Both assertion and reason are true and reason is the correct explanation of assertion.
 - b) Both assertion and reason are true but reason is not the correct explanation of assertion.
 - c) Assertion is true but reason is false.
 - d) Both assertion and reason are false.
- iii) Why is lactational amenorrhea effective for about 4-5 months after parturition?
 - a) Ovulation occurs on about the 14th day of menstruation
 - b) Ovulation does not occur during intense lactation
 - c) This method inhibits mobility of sperms
 - d) Both (b) and (c)
- iv) Which fact is not the basis of periodic absence method of birth control ?
 - a) Ovum remains alive for about 1-2 days.
 - b) Ovulation occurs on about 14th day of menstruation.
 - c) Sperms survive for about 3 days
 - d) Alteration in uterine endometrium
- v) On which days of menstrual cycle should coitus be avoided to prevent fertilisation ?
- a) 10-17

b) 6-13 c) 1-5 d) 15-28

2 **Disease Investigation:**

* Task: Choose a human disease (infectious or genetic) and research it in detail.

- * Activities:
- * Investigate the causative agent (pathogen or genetic mutation).
- * Study the mode of transmission or inheritance.
- * Learn about the symptoms, diagnosis, treatment, and prevention strategies.
- * Explore the social and economic impact of the disease.
- * Present your findings in a comprehensive report in A4 sheets

3 **Investigatory project.**

Make a well illuminating Investigatory project file on the different topics already discussed and allotted to each student in class.

Focus on all the keypoints of the given topic with the help of flowcharts, pictures and diagrams. File should include :

- Cover page
- Index
- Acknowledgement
- Certificate
- Introduction
- Details about the topic
- Bibliography

PHYSICAL EDUCATION

1 Analyze the role of biomechanics in improving sports performance. Choose a specific sport and explain how biomechanical principles can be applied to enhance technique and reduce injury risk.

2 Case Study based question

Raman is a student of class XII and is suffering from obesity. During a recent medical checkup at school he was advised to practice Yogasana and participate in sports activities for curing.

- i) The Yoga instructor at the school has asked Raman to peform
- a) Bhujangasana b) Pawanmuktasana c) Vajrasana d) Chakrasana ii) The BMI index for an obese person is
 - a) < 18.5 b) 18.5 24.9 c) > 30 d) > 25
- iii) Due to the obesity. Raman is also suffering from knock knees for which he is advised to
 - a) walk on inner edge of foot b) walk on heels
 - c) walk on outer edge of foot d) walk on toes
- 3 Investigate the impact of nutrition on athletic performance. Conduct a review of existing research on the role of different nutrients (carbohydrates, proteins, fats) in enhancing athletic performance. Discuss the implications for athletes and coaches.
- 4 Examine the relationship between physical activity and mental health. Research and discuss the evidence on how regular physical activity can influence mental health outcomes, such as anxiety and depression in adolescents.
- 5 Evaluate the effectiveness of different warm-up and cool-down techniques. Research and compare different warm-up and cool-down methods (dynamic stretching, static stretching etc.) and their impact on athletic performance and injury prevention.
- 6 Develop a proposal for promoting physical activity in your school community. Identify the current challenges and barriers to physical activity in your school and propose a plan to increase participation including strategies for students and teachers.

7 Draw a layout of Tennis court.

HINDI

1 स्थिति आधारित प्रश्न

सीमा अपनी सहेली के साथ शॉपिंग करने बाजार गई। वहां उसने देखा कि लोग जरूरत से ज्यादा चीजें खरीद रहे हैं कुछ तो सिर्फ इसलिए क्योंकि चीजें सुंदर और आकर्षक लग रही थी सीमा को भी इन सभी चीजों ने बहुत आकर्षित किया पर वह उलझन में पड़ गई कि क्या वह यह सब खरीदे या नहीं।

- क) सीमा की उलझन बाजार की किस जादुई शक्ति को दर्शाती है ?
- ख) इस स्थिति में सीमा को क्या निर्णय लेना चाहिए और क्यों ?
- ग) बाजार दर्शन पाठ के अनुसार ऐसी स्थिति में सजग उपभोक्ता की पहचान कैसे की जा सकती है ?
- 2 डेंडलाइन का क्या आशय है ?
- 3 फ्लैशबैक तथा ड्राई एंकर को स्पष्ट कीजिए।
- 4 मुद्रित माध्यमों के महत्व पर प्रकाश डालिए।
- 5 आजकल मोबाइल और इंटरनेट का अत्यधिक उपयोग विद्यार्थियों के जीवन को किस प्रकार प्रभावित कर रहा है ? इस समस्या के समाधान के लिए आप क्या सुझाव देंगे ? पांच बिंदुओं में उत्तर दें।
- 6 निम्नलिखित रचनाओं / कहानियों का अध्ययन कर उनके प्रमुख पात्रों का चरित्र वर्णन कीजिए।
 - क) पंचलाइट।
 - . ख) जहांआरा
 - ग) मारे गए गुलफाम
- 7 'सर्दी के मौसम की पहली बर्फबारी' विषय पर एक रचनात्मक लेख लिखिए।

COMPUTER

Instructions: Attempt the following problems. Use proper function structure and include exception handling wherever necessary.

- 1 Define a function calculate_area(shape, dimensions) that calculates the area of a circle, rectangle, or triangle based on user input. Include exception handling for invalid inputs.
- 2 Write a program that includes a function to divide two numbers and handle ZeroDivisionError and ValueError.
- 3 Create a recursive function to calculate factorial. Handle the case where the user enters a negative number using exceptions.
- 4 Write a Python function that takes a list of numbers and returns the average. Raise and handle an exception if the list is empty.
- 5 Simulate a basic banking system with deposit, withdraw, and balance check functions. Handle exceptions such as invalid amount and insufficient balance.
- 6 Explain the role of try, except, else, and finally with an example program where a user enters data and it is processed.