



## GREENWAY MODERN SCHOOL

### Summer Holiday Homework 2021-22

#### Science Stream

#### Class XII

Dear children,

Holidays are the well-deserved opportunity to relax and rewind by indulging in activities that are pleasurable at the same time educative. Summer Holiday Homework is an initiative on our part, to inculcate innovativeness, creativity and interest in the task assigned to our students. It will not only enable them to recapitulate what was taught but will also help them to connect themselves to the various learning processes.

We would like to thank all of you for making online classes and virtual assessment a success.

Stay Safe

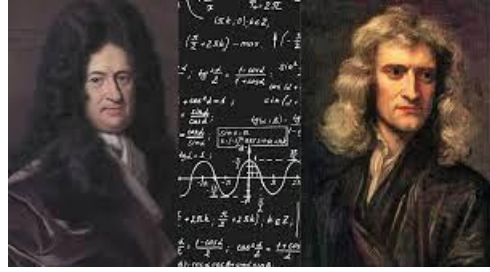
Be kind and supportive to your family

Get creative

**This too shall pass. And we will pick up you right where we left you!!!!**



## MATHEMATICS



Q.1 Identify the following known faces and write:

- (a) Name
- (b) DOB
- (c) Work/ Theory
- (d) Achievements
- (e) Example of theory that mathematician gave

Collect and present information on any other three mathematicians who worked in the field of Probability, Calculus, and Statistics. Your answer must include the above given criteria.

Q.2 Write the applications of matrices in diverse fields like optics, chemistry, robotics and animation and many more. You may describe any three.

Q.3 Practice atleast five questions of on each, multiplication , addition and subtraction of matrices . practice some word problems which have the use of matrix operations.

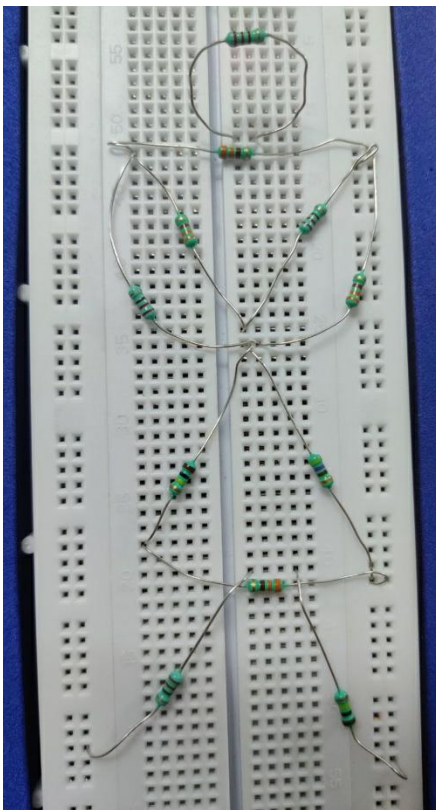
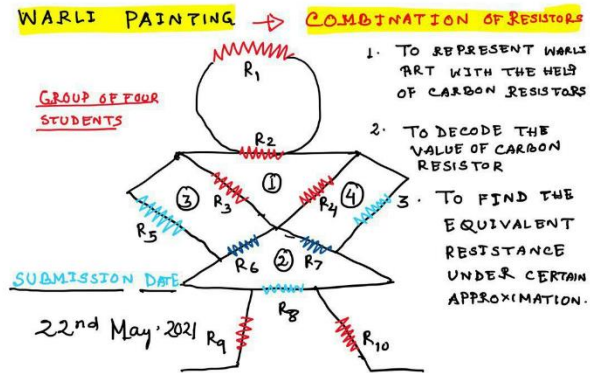
Q.4 Prepare a PPT on any two topics given below: (3 mins)

- (a) Probability
- (b) Matrices
- (c) Derivatives

**NOTE: SUBMIT YOUR ASSIGNMENT PROJECT IN THE CREATED ASSIGNMENT ONLY. NO FILES WILL BE ACCEPTED IN PERSONAL CHAT.**

# PHYSICS

## 1. Art Integrated Activity



### Reference Sample

- i) Based on the shown sample, construct a combination of resistors depicting Warli art.
- ii) Decode the value of each Carbon Resistor.
- iii) Find out the equivalent resistance for each loop.

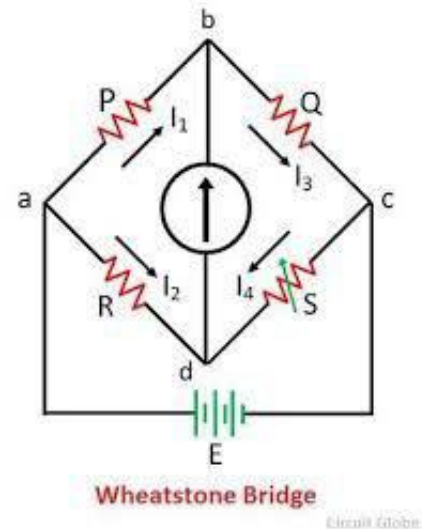
### 1. Case based Study

Wheatstone bridge is an electrical circuit used to measure an unknown electrical resistance by balancing two legs of a bridge circuit, one leg of which includes a known component. The primary benefit of the circuit is its ability to provide extremely accurate measurements

The resistance is adjusted until the bridge is balanced and no current flows through the galvanometer. At this point the voltage between the two midpoints (B and D) will be zero. Therefore the ratio of the two resistances in the known leg is equal to the ratio of the two resistances in the unknown leg.

Choose the correct option:

1. In balanced Wheatstone bridge:
  - Potential at point B and d remain same
  - Large current flows through the circuit
  - Battery becomes overheated
  - Resistance is become small
2. Wheatstone bridge is used to measure unknown:
  - Current
  - Voltage
  - Charge
  - Resistance
3. Wheatstone bridge is implemented in lab using:
  - Ammeter
  - Voltmeter
  - Metre bridge
  - Potentiometer
4. Condition for balanced Wheatstone Bridge:
  - $P/Q = R/S$
  - $R = P*S$
  - $P = R*S$
  - None of the above



3. Complete the file-work for the experiments related to:

- Ohm's law
- Metre bridge
- Potentiometer ( $E_1/E_2$ , 'r')

4. Solve the Board problems based on current electricity from the year 2018 to 2020

### COMPUTER SCIENCE

Create a small project " Vaccination Bot" in Python language As given in the main menu below:

Vaccination Bot

1. Age 60+
2. Age 45 to 60
3. Age 18 to 44
4. Age below 18.
5. Exit

Now make the UDF ( user defined functions )for the operations in the above choices:

1. If choice is 1 or 2 or 3 then , ask for name ,age Aadhar card number generate a random number between 1 to 30 as a date for the vaccination. And then display data of the person with vaccination date given to him.

2. If the choice is 4 display a message " stay tuned ...you will be vaccinated soon "

3. If the choice is 3 then exit the menu.

Note: you can make it more creative and interesting as for your choices.

## CHEMISTRY

- **ACTIVITIES:-**

1. To prepare the pure crystals of ammonium ferrous sulphate.
2. (a) To prepare 100ml of M/20 Mohr salt solution  
(b) To determine the molarity and strength of  $\text{KMnO}_4$  solution by using M/20 Mohr salt solution.
3. To detect the presence of carcinogenic constituents in water.  
(write in the sequence given below)

AIM

APPARATUS REQUIRED

THEORY ( USE, STRUCTURE, ADVANTAGES, DISADVANTAGES ETC.)

PROCEDURE ( may include tests for different radicals)

OBSERVATION

RESULT

CONCLUSION

- **ASSIGNMENT:-**

## SOLIDS

1. What are anisotropic substances?
2. Why are amorphous solids isotropic in nature?
3. Define the term 'crystal lattice.'
4. Define the term voids.
5. What type of stoichiometric defect is shown by (i)  $\text{ZnS}$  and (ii)  $\text{CsCl}$ ?
6. If the formula of a compound is  $\text{A}_2\text{B}$ , which sites would be occupied by A ions?
7. What is the coordination number for (a) an octahedral void? (b) a tetrahedral void?
8. How many octahedral voids are there in 1 mol of a compound having cubic closed packed structure?
9. Arrange simple cubic, bcc and fcc lattice in decreasing order of the fraction of the unoccupied space.
10. How much space is empty in a hexagonal closed packed solid?
11. An element crystallises separately both in hcp and ccp structure. Will the two structures have the same density? Justify your answer.
12. In Corundum,  $\text{O}^{2-}$  ions form hcp and  $\text{Al}^{3+}$  occupy two third of octahedral voids. Determine the formula of corundum.
13. Which point defect is observed in a crystal when a vacancy is created by an atom missing from a lattice site?
14. Define the term 'doping'.
15. Why does conductivity of silicon increase with the rise in temperature?
16. Name the crystal defect which lowers the density of an ionic crystal.

17. Solid A is very hard, electrical insulator in solid as well as in molten state and melts at extremely high temperature. What type of solid is it?
18. Which point defect in ionic crystal does not alter the density of the relevant solid?
19. Name one solid in which both Frenkel and Schottky defects occur.
20. Which type of defects are known as thermodynamic defects?
21. What type of substances would make better permanent magnets, ferromagnetic or ferrimagnetic? and why?
22. What type of stoichiometric defect is shown by AgCl?

SA (I) TYPE QUESTIONS (2-MARK QUESTIONS)

1. List four points of distinctions between crystalline and amorphous solids.
2. Mention the suitable reason for the following– (a) Ionic compounds are hard and brittle. (b) Copper is malleable and ductile.
3. List two differences between metallic and ionic crystals.
4. Account for the following :
  - (a) Glass objects from ancient civilizations are found to become milky in appearance.
  - (b) Window glass panes of old buildings are thicker at the bottom than at the top.
5. What is packing efficiency? Calculate the packing efficiency in body-centred cubic crystal?
6. Why is graphite soft and good conductor of electricity?
7. What do you understand by the following types of stacking sequences : (a) AB AB ..... (b) A BCABC .
8. How are the following properties of crystals affected by Schottky and Frenkel defects?
  - (a) Density (b) Electrical conductivity
9. In terms of band theory, what is the difference between (a) conductor and insulator (b) conductor and semiconductor?
10. Explain the terms : (a) Intrinsic semiconductor (b) Extrinsic semiconductor.
11. Explain how vacancies are introduced in a solid NaCl crystal when divalent cations ( $M^{2+}$ ) are added to molten NaCl.
12. What is meant by non-stoichiometric defect? Ionic solids which have anionic vacancies due to metal excess defect develop colour. Explain with the help of suitable example.
13. Define the term 'point defects'. Mention the main difference between stoichiometric and non-stoichiometric point defects.
14. Define F-centre. Mention its one consequence.
15. Give suitable reasons for the following :
  - (a) copper is conducting as such while  $CuSO_4$  is conducting only in molten state or in aq. solution.
  - (b) Alkali metal halide do not exhibit Frenkel defect.
16. List two differences between Schottky defect and Frenkel defect.
17. Explain the following terms with suitable examples (a) Ferromagnetism (b) 12-16 compounds

NUMERICALS UNIT CELLS AND CRYSTAL LATTICE

1. In a fcc arrangement of A and B atoms, atoms of A are present at the corners of the unit cell and atoms of B are present at the face centres. If one atom of A is missing from its position at the corner, what is the formula of the compound?
2. A compound made up of elements 'A' and 'B' crystallises in a cubic close packed structure. Atoms A are present on the corners as well as face centres, whereas atoms B are present on the edge-centres as well as body centre. What is the formula of the compound? [Ans. AB]
4. In a crystalline solid, anions 'C' are arranged in cubic close packing, cations 'A' occupy 50% of tetrahedral voids and cations 'B' occupy 50% of octahedral voids. What is the formula of the solid? [Ans. :  $A_2BC_2$ ]
5. Magnetite, a magnetic oxide of iron used on recording tapes, crystallises with iron atoms occupying  $1/8$  of the tetrahedral holes and  $1/2$  of the octahedral holes in a closed packed array of oxides ions. What is the formula of magnetite? [Ans. :  $Fe_3O_4$ ]

#### DENSITY OF UNIT CELL

6. Sodium crystallises in a bcc unit cell. What is the approximate number of unit cells in 4.6 g of sodium? Given that the atomic mass of sodium is  $23 \text{ g mol}^{-1}$ . [Ans. :  $6.022 \times 10^{22}$ ]
7. An element of atomic mass  $98.5 \text{ g mol}^{-1}$  occurs in fcc structure. If its unit cell edge length is 500 pm and its density is  $5.22 \text{ g cm}^{-3}$ . Calculate the value of Avogadro constant. [Ans. :  $6.02 \times 10^{23} \text{ mol}^{-1}$ ]
8. An element crystallises in a cubic close packed structure having a fcc unit cell of an edge 200 pm. Calculate the density if 200 g of this element contain  $24 \times 10^{23}$  atoms. [Ans. :  $41.6 \text{ g cm}^{-3}$ ]
9. A metallic element has a body centred cubic lattice. Edge length of unit cell is  $2.88 \times 10^{-8} \text{ cm}$ . The density of the metal is  $7.20 \text{ g cm}^{-3}$ . Calculate (a) The volume of unit cell. (b) Mass of unit cell. (c) Number of atoms in 100 g of metal. [Ans. : (a)  $2.39 \times 10^{-23} \text{ cm}^3$  (b)  $1.72 \times 10^{-22} \text{ g}$ , (c)  $1.162 \times 10^{24}$  atoms]
10. Molybdenum has atomic mass  $96 \text{ g mol}^{-1}$  with density  $10.3 \text{ g/cm}^3$ . The edge length of unit cell is 314 pm. Determine lattice structure whether simple cubic, bcc or fcc. (Given  $N_A = 6.022 \times 10^{23} \text{ mol}^{-1}$ ) [Ans. :  $Z = 2$ , bcc type]
11. The density of copper metal is  $8.95 \text{ g cm}^{-3}$ . If the radius of copper atom is 127 pm, find out whether the copper unit cell is a simple cubic, a bodycentred cubic or a face centred cubic? (Given at. mass of Cu =  $63.54 \text{ g mol}^{-1}$  and  $N_A = 6.02 \times 10^{23} \text{ mol}^{-1}$ ) [Ans. :  $Z = 4$ , fcc type]
12. A metal crystallises into two cubic lattices fcc and bcc, whose edge length are  $3.5 \text{ \AA}$  and  $3.0 \text{ \AA}$  respectively. Calculate the ratio of the density of fcc to bcc lattices.
13. The well known mineral fluorite is chemically calcium fluoride. It is known that in one unit cell of this mineral there are 4  $Ca^{2+}$  ions and 8  $F^-$  ions and that  $Ca^{2+}$  ions are arranged in a fcc lattice. The  $F^-$  ions fill all the tetrahedral holes in the fcc lattice of  $Ca^{2+}$  ions. The edge of the unit cell is  $5.46 \times 10^{-8} \text{ cm}$  in length. The density of the solid is  $3.18 \text{ g cm}^{-3}$ . Use this information to calculate Avogadro's number (Molar mass of  $CaF_2 = 78.08 \text{ g mol}^{-1}$ ) [Ans. :  $6.02 \times 10^{23} \text{ mol}^{-1}$ ]
14. Iron changes its crystal structure from body centred to cubic close packed structure when heated to  $916^\circ\text{C}$ . Calculate the ratio of the density of the BCC crystal to that of CCP crystal. Assume that the metallic radius of the atom does not change.
15. Tungsten crystallizes in body centred cubic unit cell. If the edge of the unit cell is 316.5pm, calculate the radius of tungsten atom? [Ans. : 137.04 pm]



16. Iron has a body centred cubic unit cell with a cell dimension of 286.65 pm. The density of iron is  $7.874 \text{ g cm}^{-3}$ . Use this information to calculate Avogadro number. (At. Mass of Fe = 55.845u). [Ans.:  $6.02 \times 10^{23} \text{ mol}^{-1}$ ]

#### IMPERFECTION IN SOLIDS

17. Analysis shows that a metal oxide has an empirical formula  $\text{M}_{0.96}\text{O}_{1.00}$ . Calculate the percentage of  $\text{M}^{2+}$  and  $\text{M}^{3+}$  ions in this crystal. [Ans. :  $\text{M}^{2+} = 91.7\%$ ,  $\text{M}^{3+} = 8.3\%$ ]

18. AgCl is doped with  $10^{-2}$  mol% of  $\text{CdCl}_2$ , find the concentration of cation vacancies. [Ans. :  $10^{-4} \text{ mol}$ ]

19. The concentration of cation vacancies in NaCl crystal doped with  $\text{CdCl}_2$  is found to be  $6.02 \times 10^{16} \text{ mol}^{-1}$ . What is the concentration of  $\text{CdCl}_2$  added to it? [Ans :  $10^{-5} \text{ mol\% CdCl}_2$ ]

20. The composition of a sample of Wustite is  $\text{Fe}_{0.93} \text{O}_{1.00}$ . What percentage of Fe is present as Fe(III)? [Ans. : 15.05%]

### BIOLOGY

Q1. Select the questions of 5 marks from the CBSE- 2017-2019 Examination (any 5) for Ch-2, "Sexual reproduction in flowering plants" and do them according to the marks allotted (in Biology register).

Q2. Make a list of all the scientists from Unit -1 and prepare a tabular form for the same along with their contribution in the field of biology (in Biology Register)

Q3. Prepare a list of all the abbreviations from Unit-1 along with their full forms. Please use only standardised abbreviations given in NCERT (in Biology Register).

Q4. Prepare an investigatory project to be marked in Annual CBSE Board Examination (2021-22). Topics can be discussed with me on regular basis. (5 marks)

Q5. Revise all the topics till date.

Q6. Draw well labelled diagrams of the following: (a)

T.S of young anther (b) microsporogenesis (c) megasporogenesis (d) mature embryo sac (e) embryo development in angiosperms.

Q7. Read and understand Ch-2 from NCERT, and complete the NCERT back questions in Biology register.

## **PSYCHOLOGY**

**INSTRUCTIONS FOR COMPILATION OF HOLIDAY HOMEWORK** All homework is to be done on A4 size sheets and compiled in a hard bound file / folder. Simple White cover for your file You may use white colour A4 size sheets. All sheets of a subject should be put together / tied/ stapled together and handed over to the respective subject teacher.

- The written part should be neatly presented in your own handwriting.
- Remember a well presented "Holiday Home Work" fetches you appreciation of the teachers and classmates.

**LAST DATE OF SUBMISSION OF HOLIDAY HOMEWORK : 01 July 2021**

### **HOME WORK**

#### **PRACTICAL WORK:**

- Complete the practical's conducted during the Enrichment classes in your practical files. Follow the guidelines and format given below to complete the practicals.
- Name of the Practicals need to be done in the File:
  - a) 1. Self Concept Questionnaire
  - b) 2. Student Stress Scale
  - c) 3. Bell's Adjustment Inventory

#### **PRACTICAL FORMAT :**

1. TITLE :
2. AIM :
3. INTRODUCTION /BASIC CONCEPT :
4. Description of the Test:
  - Reliability
  - Validity

- Norms

#### 4. PRELEMINARIES/Participants Profile.

- Name:
- Age:
- Sex:
- Mental Condition:

#### 5. Materials required

#### 6. Procedure

- Instructions
- Precautions
- 

7. **RAPPORT FORMATION:** A friendly conversation was carried out to make the subject feel at ease. I assured the subject that results would be kept confidential. All of his/her queries related to the study were clarified.

#### 8. Introspective report (Feedback by Subject)

#### 9. Scoring

#### 10. Result Analysis & Interpretation based on manual as discussed in class

#### 11. Conclusion

#### 12. Reference

## ENGLISH

Q1 Cut newspaper clippings of classified advertisements of all 09 categories(03 of each kind),as well as 02 Non classified advertisements and paste them in your notebook, with proper headings

Q2. Collect at least 02 invitation cards of different events paste them along with their envelopes in your note book

Q3. Collect 04 NOTICES from different sources( newspapers, magazine, official sites etc) and paste them in your notebook

Q4. Write an article expressing your views on the topic “ Stress anxiety and depression— next pandemic following covid 19” 150 words

Q5. You are a student representative of your school you got a chance to attend a workshop on the topic “Preparing future generations for natural disasters, calamities and pandemics” .Write a report of the same to be published in your school’s ‘students newsletter ‘

150 words

## **Physical Education**

Expected Learning Outcome

- Learners will become aware of different modalities of Physical Fitness.
- Learners will explore specifically about the game /sport that interest them .

1: Fitness tests administration for all items.

2 Meaning of Asanas and it's benefits along with procedure and contraindication for any four Asanas for each lifestyle disease.

3: Procedure for administering Senior Citizen Fitness Test for 5 elderly family members. 4 Any one game of your choice according to syllabus.( Labelled diagram of field & equipment Rules, Terminologies & Skills).

Note:

1. Holiday home work will be done in Physical education Practical file .