



**Gems Akademia**  
International School

**Summer Holiday**  
**Homework Grade XII**

**ENGLISH LANGUAGE**

Write a review of the movie 'King Richard'.

**ENGLISH LITERATURE**

As a literary form of writing, stream of consciousness became a part of experimentation that occupied many modernist writers of twentieth century. In the light of this statement, discuss The Singing Lesson by Katherine Mansfield and any other work of her contemporary.

Or

With reference to Act 1,2 and 3, bring out the supernatural powers of the character in The Tempest.

**BENGALI**

যে কোনো দেশের খাদ্য সংস্কৃতি সেই দেশকে চিনতে সাহায্য করে এই বিষয় অবলম্বন করে ৫০০ শব্দের মধ্যে একটি প্রবন্ধ রচনা করো.

**HINDI**

हर्दी परयोजना कार्य( कसीं एक वषिय पर)

1. आषाढ का एक दिन नाटक के आधार पर कालदास का चरित्र चर्चण कीजिए
2. भक्तनि कहानी की शीर्षक की सार्थकता को स्पष्ट करते हुए कहानी के उद्देश्य पर प्रकाश डालिए तथा भक्तनि का चरित्र चर्चण कीजिए
3. एक फूल की चाह कविता का नाट्य रूपांतरण कीजिए। 1000-1500 शब्दों में लिखिए।

**PHYSICS**

**Practical Work:**

**Experiment No. 1** – Determination of Focal Length of the given Convex Lens by U-V Method.

**This Experiment has been completed by all in class. Those who have not yet submitted the Practical File MUST submit it on 13<sup>th</sup> June 2022.**

**Experiment No. 2 – Determination of Focal length of a Convex Lens by Displacement Method.**

Writing part must be completed during the holidays.

Instructions will be given in online class.

**Project Work:**

**Complete writing on any ONE of the following Projects Topics:**

Following are the ISC Projects.

The following topics are allotted to students whose names are alongside, so that no other student chooses the same topic.

1. Electromagnetic Induction and Faraday's Laws.	Adrija Mukherjee
2. Semiconductor devices - Junction Diode.	Anubhab Roychowdhury
3. Magnetic effect of Electric Current.	Ayush Mishra
4. Photoelectric effect.	Ayush Roy
5. Charging and Discharging a Capacitor.	Debabrata Baidya
6. Interference of Light.	Debalina Chakraborty
7. Semiconductor Devices–Transistors.	Yashasvi Upadhyay
8. Viscosity	Swastika Chaklader
9. Total Internal Reflection and Fibre Optics	Sneshasis Purkait
10. Dark Matter and Dark energy	Kainat Dewan
11. Wave Particle Duality	Kaivalya Thakur
12. Surface Tension	Rohan Burman
13. Einstein's Theory of Relativity	Rhitabrata Saha
14. Kirchoff's laws and its applications	Paras Bengani
15. Doppler Effect in Sound	Debchakra Sapui
16. Interference and Beats	Md. Shams Sajid
17. Earth's magnetic Field	Rajdeep Saha
18. A.C Generator	Rishita Panja
19. Radioactive Decay and its Chemical Effects	Ritam Dutta
20. Aerodynamics	Mandira Thander

**GUIDELINES FOR THE PROJECT:**

Prepare a technical report which should include Title, Abstract, some theoretical discussion, Experimental set up, observation with tables of Data collected (if possible), graph/chart, analysis and discussion of results, deductions, conclusion.

Pg.1 - Name, Class, Section, Index No. and UID (to be filled later), Topic in bold.

Pg. 2- Acknowledgement

Pg.3- Introduction of the topic

Pg. 4 onwards - project according to guidelines

**The Projects & Lab Manuals have to be completed and submitted on 13<sup>th</sup> June 2022.**

## CHEMISTRY

- 1) ISC Project : To be completed as discussed in class.
- 2) ISC Practical File: Titration (Mohr's salt).

## BIOLOGY

### TOPICS

- 1) Taxonomy
  - a) Malvaceae – Hibiscus
- 2) Spotting
  - a) T.S. of ovary of mammal
  - b) T.S. of testis of mammal
  - c) T.S. of blastula / blastocyst of mammal
  - d) T.S. of ovary to show the type of placentation ( marginal, axile, basal & parietal)
  - e) Whole mount of Plasmodium sporozoite
  - f) Whole mount of Entamoeba histolytica trophozoite
  - g) Preserved specimen of Ascaris
  - h) Ecological adaptation
  - i) Aquatic habitat – Hydrilla, Fish
  - j) Xeric habitat – Cactus, Camel

### Flowers adapted to pollination

- 1) Hibiscus – Insect pollinated flower
- 2) Maize – Wind pollinated flower

### Project

- 1) Adrija Mukherjee – Gene therapy
- 2) Para Bengani – Down Syndrome
- 3) Md. Shams Sajid – Human genome project
- 4) Deblina Chakraborty – DNA Fingerprinting
- 5) Snehasish Purkait – Biopiracy
- 6) Swastika Chaklader – Cancer
- 7) Kaivalya Thakur – Role of microorganisms in industry
- 8) Yashasvi Upadhyay - Role of agrochemicals in increasing food production
- 9) Anubhab Chakraborty – Single cell protein
- 10) Rohan Barman –Genetic disorders
- 11) Rajdeep Saha –Aids
- 12) Rhitabrata Saha – Drug addiction and community.
- 13) Debabrata Baidya – Climate change
- 14) Rishita Panja – Human population

## MATHEMATICS

### PROJECT ON SECTION A

Choose any one project of the following from Section A as Mathematics Project I

Use file paper to write your project.

#### I. PROJECT I : SECTION A

1. Using a graph, demonstrate a function which is one-one but not onto.
2. Using a graph demonstrate a function which is invertible.
3. Construct a composition table using a binary function addition/multiplication modulo up to 5 and verify the existence of the properties of binary operation.
4. Draw the graph of  $y = \sin^{-1}x$  (or any other inverse trigonometric function), using the graph of  $y = \sin x$  (or any other relevant trigonometric function). Demonstrate the concept of mirror line (about  $y = x$ ) and find its domain and range.
5. Explore the principal value of the function  $\sin^{-1}x$  (or any other inverse trigonometric function) using a unit circle.
6. Find the derivatives of a determinant of the order of  $3 \times 3$  and verify the same by other methods.
7. Verify the consistency of the system of three linear equations of two variables and verify the same graphically. Give its geometrical interpretation.
8. For a dependent system (non-homogeneous) of three linear equations of three variables, identify infinite number of solutions.
9. For a given function, give the geometrical interpretation of Mean Value theorems. Explain the significance of closed and open intervals for continuity and differentiability properties of the theorems.
10. Explain the concepts of increasing and decreasing functions, using geometrical significance of  $\frac{dy}{dx}$ . Illustrate with proper examples.
11. Explain the geometrical significance of point of inflexion with examples and illustrate it using graphs.
12. Explain and illustrate (with suitable examples) the concept of local maxima and local minima using graph.
13. Explain and illustrate (with suitable examples) the concept of absolute maxima and absolute minima using graph.
14. Illustrate the concept of definite integral  $\int_a^b f(x)dx$ , expressing as the limit of a sum and verify it by actual integration.
15. Demonstrate application of differential equations to solve a given problem (example, population increase or decrease, bacteria count in a culture, etc.).

16. Explain the conditional probability, the theorem of total probability and the concept of Bayes' theorem with suitable examples.

17. Explain the types of probability distributions and derive mean and variance of binomial probability distribution for a given function.

**Project must be submitted latest by 30<sup>th</sup> June 2022.**

**B. Practice more sums on Inverse Trigonometric Function, Continuity and Differentiability, Derivatives.**

## Computer Science

The following JAVA programs must be done in the practical file.

### Program No. 21

A Hoax Number is defined as a composite number, whose sum of digits is equal to the sum of digits of its distinct prime factors.

For example :

(i) 84 is a hoax number as

The sum of digits :  $8+4=12$

Distinct prime factors : 2, 3, 7

The sum of digits of its distinct prime factors :  $2 + 3 + 7 = 12$

(ii) 85 is a hoax number as

The sum of digits :  $8+5=13$

Distinct prime factors : 5, 17

The sum of digits of its distinct prime factors :  $5 + 1 + 7 = 13$

Accept two positive integers  $m$  and  $n$ , where  $m$  is less than  $n$  as user input. Display all Hoax numbers that are in the range between  $m$  and  $n$  (both inclusive) and output them along with the frequency, in the format given below:

Test your program with the following data and some random data:

#### Example 1

INPUT:

$m = 5$

$n = 100$

OUTPUT:

THE HOAX NUMBERS ARE:

22 58 84 85 94

FREQUENCY OF HOAX NUMBERS IS: 5

#### Example 2

INPUT:

$m = 100$

$n = 200$

OUTPUT:

THE HOAX NUMBERS ARE:

136 160 166

FREQUENCY OF HOAX NUMBERS IS: 3

#### Example 3

INPUT:

$m = 100$

$n = 130$

## Program No 22

A Prime-Adam integer is a positive integer (without leading zeros) which is a prime as well as an Adam number.

**Prime number:** A number which has only two factors, i.e. 1 and the number itself.

Example: 2, 3, 5, 7 ... etc.

**Adam number:** The square of a number and the square of its reverse are reverse to each other.

Example: If  $n=13$  and reverse of 'n' = 31, then,

$$(13)^2 = 169$$

$$(31)^2 = 961 \text{ which is reverse of } 169$$

thus 13, is an Adam number.

Accept two positive integers  $m$  and  $n$ , where  $m$  is less than  $n$  as user input. Display all Prime-Adam integers that are in the range between  $m$  and  $n$  (both inclusive) and output them along with the frequency, in the format given below:

Test your program with the following data and some random data:

### Example 1

**INPUT:**  $m = 5$   
 $n = 100$

**OUTPUT:** THE PRIME-ADAM INTEGERS ARE:  
11 13 31  
FREQUENCY OF PRIME-ADAM INTEGERS IS: 3

### Example 2

**INPUT:**  $m = 100$   
 $n = 200$

**OUTPUT:** THE PRIME-ADAM INTEGERS ARE:  
101 103 113  
FREQUENCY OF PRIME-ADAM INTEGERS IS: 3

### Example 3

**INPUT:**  $m = 50$   
 $n = 70$

**OUTPUT:** THE PRIME-ADAM INTEGERS ARE:  
NIL  
FREQUENCY OF PRIME-ADAM INTEGERS IS: 0

### Example 4

**INPUT:**  $m = 700$   
 $n = 450$

**OUTPUT:** INVALID INPUT.

## Program No 23

A **Fascinating** number is one which when multiplied by 2 and 3 and then, after the results are concatenated with the original number, the new number contains all the digits from 1 to 9 exactly once. There can be any number of zeros and are to be ignored.

Example: 273

$$273 \times 1 = 273$$

$$273 \times 2 = 546$$

$$273 \times 3 = 819$$

Concatenating the results we get, 273546819 which contains all digits from 1 to 9 exactly once.

Thus, 273 is a Fascinating number.

Accept two positive integers m and n, where m must be less than n and the values of both 'm' and 'n' must be greater than 99 and less than 10000 as user input. Display all Fascinating numbers that are in the range between m and n (both inclusive) and output them along with the frequency, in the format given below:

Test your program with the following data and some random data:

### Example 1

**INPUT:** m = 100  
n = 500

**OUTPUT:** THE FASCINATING NUMBERS ARE:  
192 219 273 327

FREQUENCY OF FASCINATING NUMBERS IS: 4

### Example 2

**INPUT:** m = 900  
n = 5000

**OUTPUT:** THE FASCINATING NUMBERS ARE:  
1902 1920 2019 2190 2703 2730 3027 3270

FREQUENCY OF FASCINATING NUMBERS IS: 8

### Example 3

**INPUT:** m = 400  
n = 900

**OUTPUT:** THE FASCINATING NUMBERS ARE:  
NIL

FREQUENCY OF FASCINATING NUMBERS IS: 0

## Program No. 24

Design a program to accept a day number (between 1 and 366), year (in 4 digits) from the user to generate and display the corresponding date. Also, accept 'N' ( $1 \leq N \leq 100$ ) from the user to compute and display the future date corresponding to 'N' days after the generated date. Display an error message if the value of the day number, year and N are not within the limit or not according to the condition specified.

Test your program with the following data and some random data:

### Example 1

INPUT: DAY NUMBER: 255  
YEAR: 2018  
DATE AFTER (N DAYS): 22

OUTPUT: DATE: 12 TH SEPTEMBER, 2018  
DATE AFTER 22 DAYS: 4 TH OCTOBER, 2018

### Example 2

INPUT: DAY NUMBER: 360  
YEAR: 2018  
DATE AFTER (N DAYS): 45

OUTPUT: DATE: 26 TH DECEMBER, 2018  
DATE AFTER 45 DAYS: 9 TH FEBRUARY, 2019

### Example 3

INPUT: DAY NUMBER: 500  
YEAR: 2018  
DATE AFTER (N DAYS): 33

OUTPUT: DAY NUMBER OUT OF RANGE.

### Example 4

INPUT: DAY NUMBER: 150  
YEAR: 2018  
DATE AFTER (N DAYS): 330

OUTPUT: DATE AFTER (N DAYS) OUT OF RANGE.

## Program No 25

A **Goldbach** number is a positive even integer that can be expressed as the sum of two odd primes.

Note: *All even integer numbers greater than 4 are Goldbach numbers.*

Example:  $6 = 3 + 3$

$10 = 3 + 7$

$10 = 5 + 5$

Hence, 6 has one odd prime pair 3 and 3. Similarly, 10 has two odd prime pairs, i.e. 3 and 7, 5 and 5.

Write a program to accept an even integer 'N' where  $N > 9$  and  $N < 50$ . Find all the odd prime pairs whose sum is equal to the number 'N'.

Test your program with the following data and some random data:

Example 1:

INPUT: N = 14

OUTPUT: PRIME PAIRS ARE: 3, 11  
7, 7

Example 2:

INPUT: N = 30

OUTPUT: PRIME PAIRS ARE: 7, 23  
11, 19  
13, 17

Example 3:

INPUT: N = 17

OUTPUT: INVALID INPUT. NUMBER IS ODD.

Example 4:

INPUT: N = 126

OUTPUT: INVALID INPUT. NUMBER OUT OF RANGE.

## ACCOUNTANCY

Preparation of Common Size and Comparative Income Statement and Balance Sheet of a company by taking into account its audited, unaudited / imaginary financial results of two consecutive quarters of an accounting year or of two consecutive accounting years.

- The comparison has to be made in the form of Common Size and Comparative Income Statement and Balance Sheet.
- The comparison could also be shown graphically and/ or pictorially (bar diagrams and pie charts).

## COMMERCE

1. Visit a commercial Bank. Find out the procedure to open a savings account.

Find out the details of various Agency & General utility services provided by the bank.

2. Select any business undertaking. Study the selected business in terms of ownership, capital and profitability. Make a S.W.O.T. analysis and present it in a tabular form.

## BUSINESS STUDIES

**PROJECT WORK:** *Consider any two successful business leaders. Give a brief account of their leadership styles. Explain the impact of their leadership styles in the achievements of the organizational goals of their respective organizations.*

### QUESTION ANSWERS:

- a) *“HRM plays a vital role both in an organizations and in the society.” Explain.*
- b) *What is campus recruitment? How does campus recruitment benefits the students as well as business houses.*
- c) *“Psychological test help to predict how successful a candidate could be on the job.” Explain any three types of tests that would help management judge the capability of a candidate.*
- d) *An organization has decided to follow a three-tier selection process of appointing Executive Trainees: Aptitude Test, Group Discussion and Final Interview. Outline the details of this process stating clearly the tasks involved at each stage.*
- e) *Suppose in a large modern organization, you have been recruited as a staff training officer. Name and explain briefly different types of training programmes you would like to organize. Also, indicate what should be your pre-training and post-training activities.*
- f) *Define training. Give any four benefits that an employee can get from training .*

## ECONOMICS

Prepare a report on the competition in the aviation sector in India with reference to:

- a) Performance of the public sector and private sector.
- b) Operational strategies adopted by budget/low-cost carriers.

## HISTORY

Project Topic (Any one)

**Martin Luther or Nelson Mandela**

## GEOGRAPHY

Students will prepare a project on local field surveys on any one of the following topics. The length of the project report will be 15-20 written pages excluding photographs, maps diagrams and sketches. These surveys should be organized with a table of contents, sample taken and statistical methods used, interview schedule. The report should be organized systematically and the conclusions should be clearly stated.

1. Agricultural land use survey.

2. Household survey, of about 30-60 households of a village or locality. Family size, age structure, educational background, occupation, involvement of men and women in economic activity, educational service. Draw conclusions to reflect the economic development of the household.

3. Study of a manufacturing industry or a self-employed person.

## SOCIOLOGY

Topic - Communalism in India

## HOME SCIENCE

Meal planning for:-

- i. Birthday party
- ii. Picnic Basket (packed lunch)
- iii. Obesity

## ART

### TOPIC - Collage

<b>Collage</b>	Collage describes both the technique and the resulting work of art in which pieces of paper, photographs, fabric and other ephemera are arranged and stuck down onto a supporting surface.
<b>Theme</b>	<i>Choose one starting point and develop your idea.</i> A. Hanging out with friends. B. Poster of a movie. C. Love your pets.
<b>Activities</b>	1. Size of the Collage should be <b>22 inch x 28 inch</b> . 2. Make layout drawing. 3. Stuck onto supporting surface. <b>(E.g.: Mount Board)</b> 4. Step by step presentation with photograph, write up and final outcome.

## SUPW

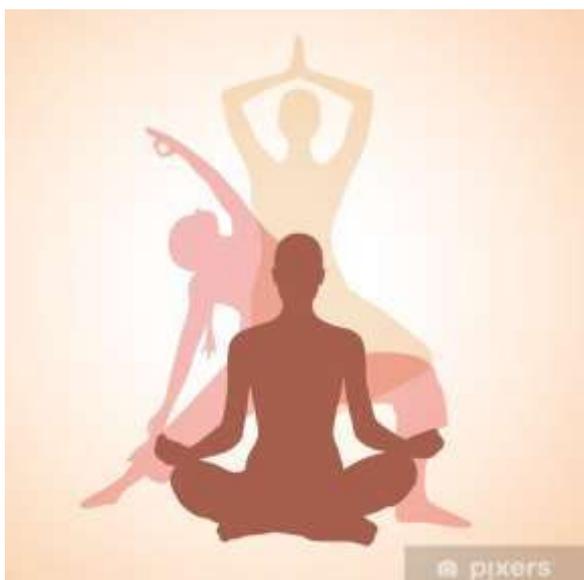
### Topic: i) Poster and ii) Candle

**Socially Useful Productive Work (SUPW)** is a "purposive productive work and services related to the needs of the child and the community will be proved meaningful to the learner. The training acquired in the classroom or home is expected to help students to solve day-to-day problems of the community.

In addition to developing individual skills, **SUPW** aims to help develop among the students the habit to work as a community, encourage community thinking, increase awareness of scientific advancements and develop a scientific outlook.

### Topic 1: Posters on Benefits of Yoga

1. Identify the goal of your **poster**.
2. Consider your target audience.
3. Decide where you want to share your **poster**.
4. Select a pre-made **poster** template.
5. Pick a relevant or branded colour scheme.
6. Include a clear call to action.
7. Use varied fonts to **create** visual hierarchy.



### Topic 2: Homemade Candles

#### Supply list: candle

- One package of candle-making soy wax
- One package of large candle wicks
- One bottle of fragrance oil
- One spatula

- One heat-proof container
- One double boiler
- One thermometer
- One pair of chopsticks or pencils

### **Step 1: Measure the wax**

Before you begin the candle-making process, make sure you have a clean, flat surface to work on. You can also protect the area with newspaper or paper towels. Move anything that you don't want to get wax on.

Measure out how much wax you would need to fill your container, then double it. That's how much wax you will need to melt.

### **Step 2: Melt the wax**

Pour the wax into your double boiler and allow to melt for **10 to 15 minutes**, stirring frequently.

### **Step 3: Add fragrance oils**

When your candle wax is melted, it's time to add fragrance oils. Follow the instructions on your wax package for how much to add. Simply pour it into your melted wax and stir for a few seconds. While this step is optional, we definitely recommend it for a lovely floral smell.

### **Step 4: Attach the wick**

The wick needs to be attached to the bottom of your container before you pour in the wax. You can attach the wick by dipping it in the melting wax then quickly sticking it to the bottom of the container. Let the wax sit **five minutes** to harden. Alternatively, you can superglue it.

### **Step 5: Pour the wax**

Before you pour the wax into your container, let it cool for a few minutes. When the temperature on the thermometer reads 140 degrees, it's time to pour.

Then, slowly pour the wax into your container. Hold the wick in place, but don't pull on it. Leave a small amount of wax in the boiler for topping off your candle later.

### **Step 6: Secure the wick**

To prevent your wick from swaying in the melty wax, you need to secure it in place. Lay two chopsticks across the top of the container. Sandwich the wick in between so that it stays centered while the wax hardens.

Allow the wax to set for **four hours** at room temperature.

**Step 7: Add more wax**

If your candle hardened with an unsightly top (think cracks or holes) simply reheat and add your remaining wax. Let harden.

**Step 8: Cut the wick.**

Your candle wick should be less than half an inch long. If, when lit, the candle flickers or has a tall flame, trim the wick.



---