



# M.D. DAYANAND MODEL SCHOOL

NAKODAR

A large, stylized graphic for 'Summer Holiday Assignment'. The word 'Summer' is in orange cursive, and 'Holiday' is in blue cursive. A smiling sun wearing sunglasses is positioned above the text. The graphic is surrounded by decorative elements like stars and palm leaves.

# Summer Holiday

ASSIGNMENT



LEARN



EXPLORE



GROW



SUCCEED

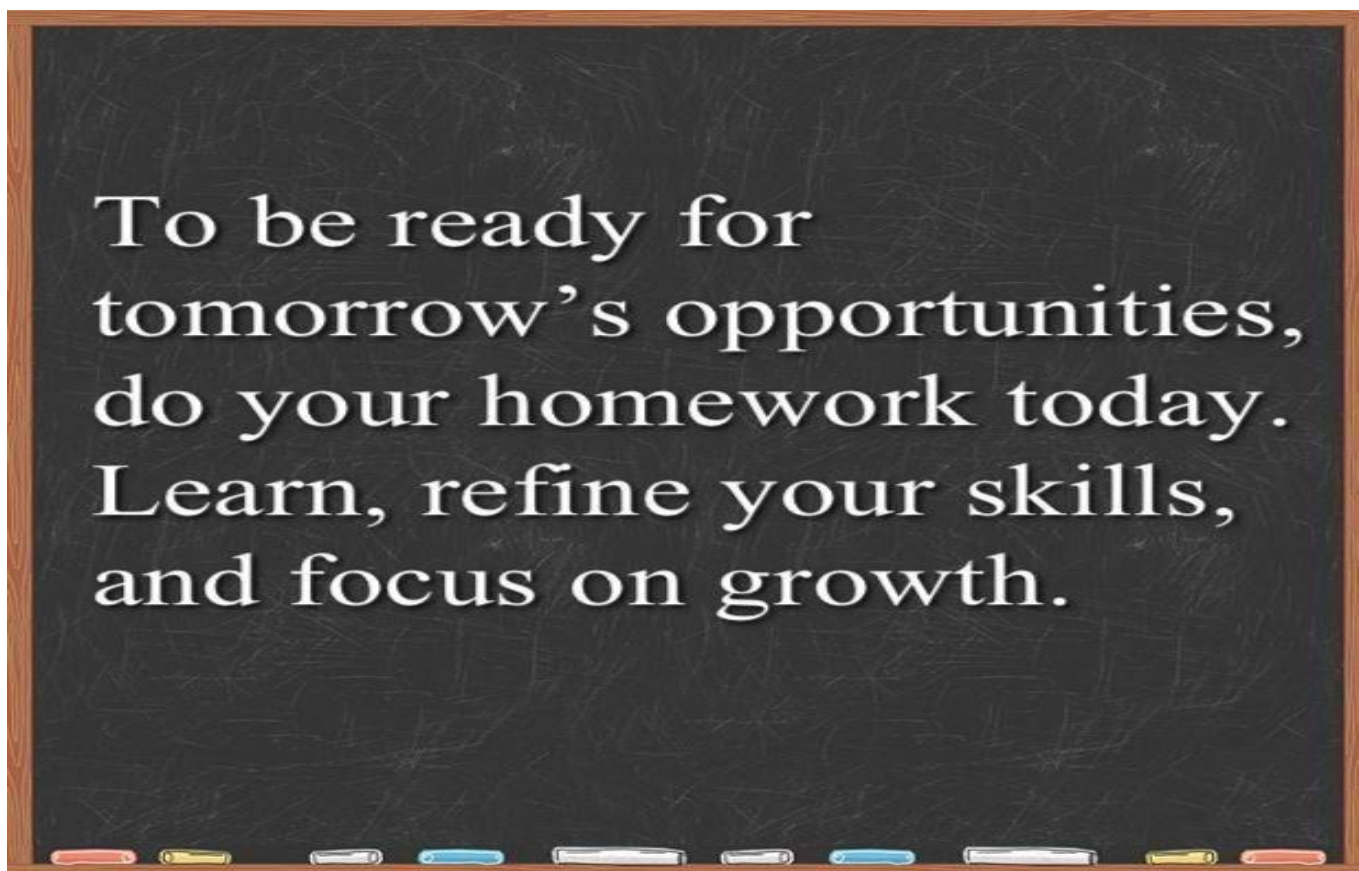
Enjoy • Learn • Grow  
Make the most of your holidays!

A small graphic of a clipboard with a blue cup holding several colored pencils. The clipboard has a piece of paper with the text 'Learn Explore Grow Succeed' and a red heart below it.


Learn  
Explore  
Grow  
Succeed

# CLASS XI (COMMERCE)

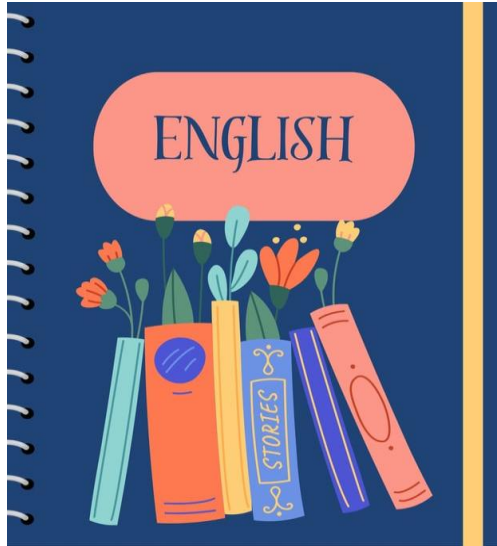
## Home tasks for summer vacations.



**\*Prepare syllabus of UT-1 along with following tasks for summer vacation.**

SUBJECTS	TASKS
<p style="text-align: center;"><b>Economics</b></p> 	<p><b>NOTE: Make a single project file for all the given tasks. Make it presentable , as it will be a part of final practical examination.</b></p> <p>*****</p> <p><b>Exploring Mean &amp; Median in Real Life</b></p> <p>*****</p> <p><b>Part A: Data Collection</b></p> <ul style="list-style-type: none"> <li>• <b>Daily Expenses:</b> Track your personal or family daily expenses for 10 consecutive days.</li> <li>• <b>Study Hours:</b> Record the number of hours you study each day for 2 weeks.</li> <li>• <b>Social Media Usage:</b> Note the time spent on social media daily for 7 days.</li> </ul> <p><b>Part B: Calculation</b></p> <ol style="list-style-type: none"> <li><b>1. Mean:</b> Calculate the average for each dataset. Convert your dataset in all three types of series. Calculate Mean by all three methods.</li> <li><b>2. Median:</b> Arrange the data in ascending order and find the middle value <b>And represent it graphically.</b></li> <li><b>3. Comparison:</b> Write a short note on how the mean and median differ in each case. Which is a better measure of central tendency and Why?</li> </ol> <p><b>**Your file must be equipped with acknowledgement , certificate , introduction, conclusion and bibliography.</b></p>

## English



## PROJECT WORK

### Chapter: Discovering Tut: The Saga Continues... (Hornbill)

#### Project Title:

"Unearthing the Mystery: King Tut's Life and Legacy"

#### Objectives of the study

- Aligning to the intersection of history and science
- Gain research and critical analysis skills
- Explore creative expression and empathy for historical figures
- Improve presentation and writing abilities

#### Project Components

#### 1. Chapter Summary and Theme Analysis

- **Task:** Write a 400–600 words summary of the chapter.
- **Focus:**
  - Who was King Tut?
  - What mystery surrounds his death?
  - What scientific methods were used to investigate the mummy?
  - What themes (e.g., modern science vs. ancient traditions, curiosity, legacy) emerge?

#### 2. Research Report: "The Boy King and His World"

- **Task:** Prepare a 2–3 page illustrated report on:
  - Ancient Egyptian civilization during Tutankhamun's reign
  - Burial customs and the importance of the afterlife
  - Howard Carter's discovery of the tomb
  - The impact of CT scans and forensic archaeology
- **Sources:** Use books, trusted websites, documentaries (e.g., *National Geographic*, *BBC*).

#### 3. Visual Component

- **Options:**
  - Create a **poster or digital presentation** titled: "King Tut: Life, Death, and Discovery."
  - Include images (or drawings), maps of the

Valley of the Kings, and timelines.

#### 4. Oral Presentation (Optional for Home Practice)

- **Task:** Prepare a 2–3 minute speech or video explaining:
  - Why King Tut still fascinates people today.
  - What we learned from the forensic investigation.

#### Rubrics

Component	Marks
Summary & Theme	5
Research Report	5
Visual Component	5
Presentation	5
<b>Total</b>	<b>20</b>

### Accountancy



#### Accounting Simulation (Project File)

◆ **Plan your business by deciding a name, business type (trading, service, or manufacturing), Decide an initial investment amount (capital you are putting in your business)**

**Use this capital to list initial assets you will buy (furniture, stock, cash in hand, etc.). List initial liabilities - any money you borrowed or need to pay.**

◆ **Write a brief introduction about your business**

**Design a business logo**

\* **A sample invoice with your business name.**

\* **Create a simple advertisement poster or flyer for your business**

◆ **Prepare journal entries for 10 days of business operations, recording realistic transactions like purchases, sales, expenses, drawings, and bank dealings etc. using the standard accounting format.**

◆ **Open ledger accounts for all relevant heads. Post the journal entries into their respective ledger accounts using ledger format.**

◆ **Apply the theory base of accounting:- List and explain any 5 accounting concepts/Principles used in your business.**

◆ **Reflect on your learning in a short paragraph by answering:**

✓ **What did you learn from maintaining the journal?**

✓Why is accounting important for business?  
✓What was one challenge you faced during the project (limitation of accounting)

'Think like a real business owner. Be creative.'

## Marketing



### SUBJECT :- MARKETING

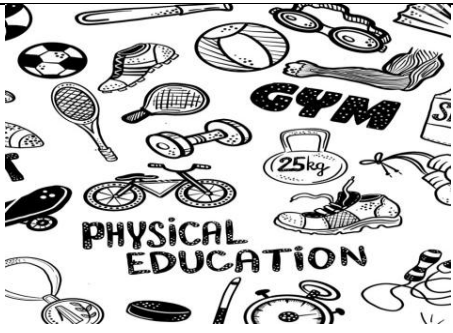
- **Create Your Own Product :- (Roll No. 1 to 10)**  
Project Work on 4 P's of Marketing Mix of Product (Page limit:- 15-20)  
Design Branding, Packaging, Pricing and Promotional strategies for a new product
- **Waste To Wealth Marketing Activity:- (Roll No. 11 to 20)**  
Create useful products (at least 5) from waste material and decide promotional strategies  
Example:- Newspaper pen stand, Bottle Planter, Decorative items  
Students decide: Brand name, Price, Packaging and Promotional strategies
- **What Can Be Marketed Collage:- (Roll No. 21 to 30)**  
Prepare a collage of what can be marketed  
Use images, symbols and different colors
- **The World Of Brands:- Exploring 30 popular bands:- (Roll No. 31 to 40)**  
Prepare file including names and Logos (pictures) of 30 brands.  
Add their tag lines
- **Advertisement Poster:- (Roll No. 41 to 47)**  
Create social media advertisement poster for:-  
Cosmetic products, Mobile phones, Chocolates and Healthy Drinks  
Can be handmade or digital  
Include:- Hash tags, offers etc.
- **Make PPT on the topics given (file attached) (Page limit:- 10-15) (For All The Students)**

## Banking



- ❖ **A visit to Bank**  
Make file of various vouchers used in bank for different purposes.  
(For all the students)
- ❖ **Make PPT on the topics given (file attached) (Page limit:- 10-15)**

## Physical Education

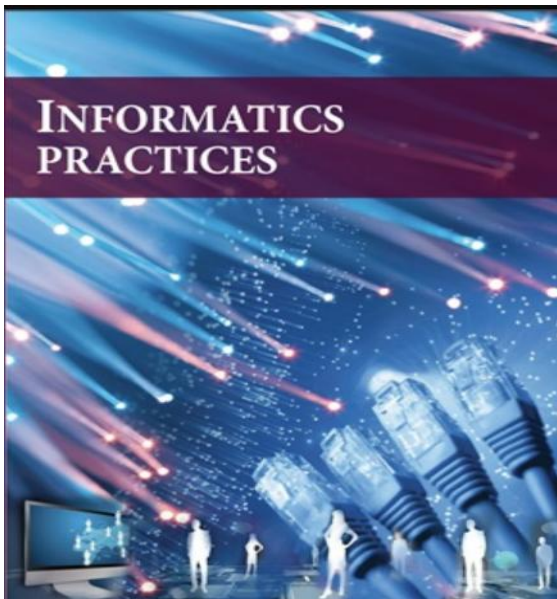


**Make a practical file on any of the given topics:**

1. Volleyball
2. Kho - kho

**IP**

**(Practical file of MQ SQL )**



1. Create Database Named Class 11
2. Open Database Class 11
3. Create a student table with the student id, class, section, gender, name, dob, and marks as attributes where the student id is the primary key.
4. View the structure of the table
5. Insert the details of at least 10 students in the above table.
6. Display the details of the student table.
7. Delete record of students who secured less than 65 marks.
8. Increase marks by 5% for who have studentid more than 1105.
9. Display the content of the table of female students.
10. Display studentid, Name and Marks whose marks are more than 50.
11. Find the average of marks from the student table.
12. Find the number of students, who are from section 'A'.
13. Add a new column email in the above table.
14. Add the email ids of each student in the created email column.
15. Display the information of all the students, name contains 'sh'
16. Display the information of all the students, name starts with 'sh'

17. Display studentid, Name, DOB of who are born in 2005

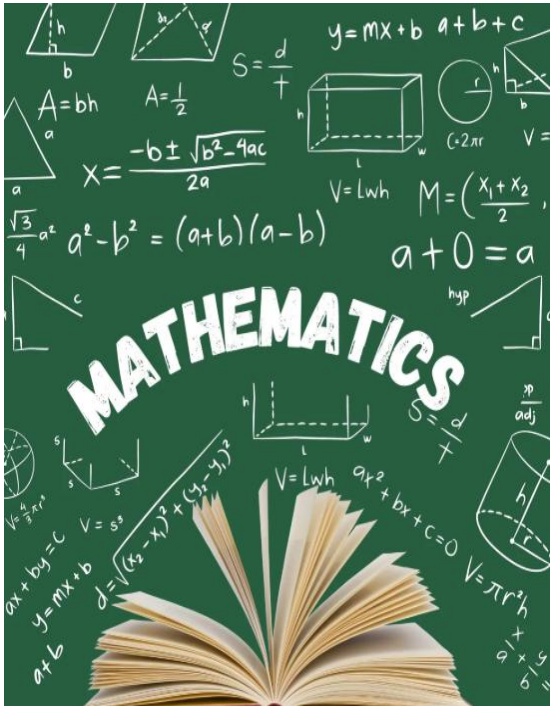
18. Display studentid, Name, DOB, Marks, Email of male students in ascending order of their names.

19. To find average of marks from the students

20. Drop table.

21. Drop Database.

## Mathematics



**“Solve assignment on mathematics notebook.”**

**Q1. A school conducted a survey among 100 students regarding participation in two sports: Basketball and Football.**

- 58 students play Basketball
- 42 students play Football
- 18 students play both games

**Based on the above information, answer the following: Represent the information using a Venn diagram.**

1. Find the number of students who play only Basketball.
2. Find the number of students who play only Football.
3. Find the number of students who play neither game.
4. If one more sport Cricket is introduced, explain how set theory becomes useful in analysing the data.

**Q2. Let  $A = \{x: x \text{ is a factor of } 24\}$  and**

**$B = \{x: x \text{ is a prime number less than } 15\}$**

**Answer the following:**

1. Write A and B in roster form.
2. Find:  $A \cap B$ ,  $A \cup B$ ,  $A - B$ ,  $B - A$ .
3. Verify whether:  $B \subseteq A$
4. Find:  $(A - B) \cup (B - A)$

**Q3. A company assigns exactly one employee ID to each employee.**

1. Explain why this assignment represents a function.
2. Identify the domain and codomain.
3. Can two employees have the same employee ID? Justify.
4. Can one employee have two employee IDs? Explain mathematically.

**Q4. The temperature in a city on a particular day is given by:  $T(x) = 2x + 18$**

**where  $x$  represents time in hours after sunrise. Find:**

1. Temperature after 3 hours.
2. Temperature after 8 hours.
3. Time when temperature becomes  $30^\circ\text{C}$ .

**Q5. If  $z_1 = 5 + 3i, z_2 = 2 - 7i$  Find:  $z_1 + z_2$  ,  $z_1 - z_2$  ,  $z_1 z_2$ , Conjugate of  $z_2$ .**

**Q6. A factory manufactures water bottles.**

**Profit per bottle = ₹35 , Daily fixed expenditure = ₹4200. The owner wants profit greater than ₹7000.**

- 1. Form the inequality.**
- 2. Find the minimum number of bottles required.**
- 3. Represent the solution on number line.**

**Q7. Solve:  $\frac{3x-4}{2} \leq 5$  and represent the solution set on number line.**

**Q8. From 8 boys and 6 girls, a committee of 5 students is to be formed.**

**Find the number of ways in which the committee can be formed if:**

- 1. No restriction is given.**
- 2. Exactly 2 girls are included.**
- 3. At least 3 boys are included.**

**Q9. Find the coordinates of a point P which is equidistant from four points  $O(0,0,0)$ ,  $A(a,0,0)$ ,  $B(0,b,0)$  and  $(0,0,c)$ .**

**Q10. Find the value of x and y, if  $\frac{(1+i)x-2i}{3+i} + \frac{(2-3i)y+i}{3-i} = i$**

**Q11. A manufacturer has 600 litres of a 12% solution of acid. How many litres 30% acid solution must be added to it so that acid content in the resulting mixture be more than 15% but less than 18%.**

**Q12. The three sides of a triangle are given by  $(2x+3)$  cm,  $(4x-1)$  cm and 14 cm on the basis of this, answer the following.**

- (i) If the perimeter of triangle is at least 34 cm, then what is the minimum value of x?**
- (ii) If the perimeter of triangle is at most 82 cm, then what is the maximum value of x?**
- (iii) As we know that the sum of two sides in a triangle is greater than third side so find x if  $(2x+3) + (4x-1) > 14$  and represent the solution on number line.**

**Hindustani music vocal**

**Make a project file on the following topics:**

**Unit -1** Swara , Saptak , Thaata , and Margi Sangeet

**Unit -2** Dhrupad.

**Unit - 3** Life sketch Tansen and V.N.Bhatkhande

**Unit -4** Taal Ektala and Teentala



**Unit -5** Rag Bihag and Bhairavi

## HOLIDAY HOMEWORK 2026-27

### CLASS- XI SCIENCE

“SUMMER  
IS THE  
PERFECT TIME  
TO RESET AND  
RECHARGE.”

**Prepare syllabus of UT-1 along with following tasks of summer vacation.**

<b>SUBJECT</b>	<b>TASK</b>
<b>English</b>	<p style="text-align: center;"><b>PROJECT WORK</b></p> <p style="text-align: center;"><b>Chapter: Discovering Tut: The Saga Continues... (Hornbill)</b></p> <p><b>Project Title:</b></p> <p style="text-align: center;">"Unearthing the Mystery: King Tut's Life and Legacy"</p> <p><b>Objectives of the study</b></p> <ul style="list-style-type: none"><li>• Aligning to the intersection of history and science</li><li>• Gain research and critical analysis skills</li><li>• Explore creative expression and empathy for historical figures</li><li>• Improve presentation and writing abilities</li></ul> <p style="text-align: center;"><b>Project Components</b></p> <p><b>1. Chapter Summary and Theme Analysis</b></p> <ul style="list-style-type: none"><li>• <b>Task:</b> Write a 400–600 words summary of the chapter.</li></ul>

- **Focus:**
  - Who was King Tut?
  - What mystery surrounds his death?
  - What scientific methods were used to investigate the mummy?
  - What themes (e.g., modern science vs. ancient traditions, curiosity, legacy) emerge?

## 2. Research Report: "The Boy King and His World"

- **Task:** Prepare a 2–3 page illustrated report on:
  - Ancient Egyptian civilization during Tutankhamun’s reign
  - Burial customs and the importance of the afterlife
  - Howard Carter’s discovery of the tomb
  - The impact of CT scans and forensic archaeology
- **Sources:** Use books, trusted websites, documentaries (e.g., *National Geographic*, *BBC*).

## 3. Visual Component

- **Options:**
  - Create a **poster or digital presentation** titled: “King Tut: Life, Death, and Discovery.”
  - Include images (or drawings), maps of the Valley of the Kings, and timelines.

## 4. Oral Presentation (Optional for Home Practice)

- **Task:** Prepare a 2–3 minute speech or video explaining:
  - Why King Tut still fascinates people today.
  - What we learned from the forensic investigation.

### Rubrics

Component	Marks
Summary & Theme	5
Research Report	5
Visual Component	5
Presentation	5
<b>Total</b>	<b>20</b>

Biology

**CLASS XI - BIOLOGY**

## HOME ASSIGNMENT

**ART INTEGRATED PROJECT**

# MITOSIS & MEIOSIS

*Cell Division Through Art*

**YOUR TASK**

Create a creative and informative model or activity to represent the stages of **MITOSIS** and **MEIOSIS** using art and craft materials.

**USE ANY OF THE MATERIALS**

Clay

Beads

Thread / Wool

Cardboard

Toothpicks

Colours & Markers

**YOU MAY CREATE**

- ★ 3D Cell Division Models
- ★ Bead Chromosome Models
- ★ Thread Art Diagrams
- ★ Hanging Mobile Models
- ★ Any other innovative idea

**MUST INCLUDE**

- ✓ Proper labeling of all stages
- ✓ Difference between mitosis & meiosis
- ✓ Scientific accuracy
- ✓ Creativity & neat presentation

**POINTS TO REMEMBER**

- ◆ Show all stages in correct sequence.
- ◆ Highlight key events (chromosome behavior, division of nucleus, cytokinesis etc.).
- ◆ Use neat labels and colors.
- ◆ Make it creative, informative and easy to understand.

**MITOSIS vs MEIOSIS**

FEATURE	MITOSIS	MEIOSIS
No. of divisions	One	Two
No. of daughter cells	Two	Four
Chromosome number	Maintained	Halved
Genetic variation	No	Yes
Occurs in	Somatic cells	Germ cells
Function	Growth & repair	Gamete formation

*Let's Learn Biology Creatively!*

**SUBMISSION DATE:** \_\_\_\_\_

**CLASS XI - BIOLOGY**

## HOME ASSIGNMENT

**ART INTEGRATED ACTIVITY**

# BINOMIAL NOMENCLATURE

*Fun with Scientific Names*

**YOUR TASK**

Create a creative activity or model to understand and showcase **BINOMIAL NOMENCLATURE** using art and craft materials.

Binomial Nomenclature is the system of giving scientific names to organisms using two words:  
**Genus species**  
 (First word is Genus – Capital letter)  
 (Second word is species – Small letter)  
 Example: *Mangifera indica*

**USE ANY OF THESE IDEAS**

Clay Organism Models

Bead Classification Chain

Thread Taxonomy Tree

Scientific Name Flash Cards

Taxonomy Art / Poster

**INCLUDE IN YOUR WORK**

- ✓ Common name of the organism
- ✓ Scientific name (Genus + species)
- ✓ Highlight Genus and Species
- ✓ Neatness and creativity
- ✓ Short note on the organism (optional)

**EXAMPLES**

- *Homo sapiens* (Human)
- *Mangifera indica* (Mango)
- *Panthera tigris* (Tiger)
- *Solanum tuberosum* (Potato)
- *Azadirachta indica* (Neem)

**SUBMISSION DATE:** \_\_\_\_\_

*"Every organism has a scientific identity!"*

**Note:** Do only one of the above.

Physical Education

**Make a practical file on any of the given topics**

1. Volleyball
2. Kho - kho

# Assignment 1

## Chapter 1: Some Basic Concepts of Chemistry

### Section A: Case Study Based Questions

#### Case Study

A fertilizer company prepared a sample containing ammonium sulfate and impurities. A chemist analysed 13.2 g of the sample and found that it contained 6.8 g nitrogen. During transportation, another bag of the same fertilizer absorbed moisture from air and its mass increased by 5%.

#### Questions

1. Calculate the percentage of nitrogen in the original sample.
2. Determine whether the absorbed moisture will change the percentage composition of nitrogen. Give reason.
3. State which law of chemical combination is applicable in percentage composition studies.

Chemistry

### Section B: Short Answer Type Questions

1. Why is atomic mass of chlorine taken as 35.5 u and not a whole number?
2. A student calculated molar mass of NaOH as  $39 \text{ g mol}^{-1}$  instead of  $40 \text{ g mol}^{-1}$ . Explain how this error will affect the number of moles calculated.
3. Why is mole concept considered a bridge between microscopic and macroscopic chemistry?

### Section C: Long Answer Type Questions

1. Explain how Dalton's Atomic Theory successfully explained the laws of chemical combinations. Also mention one limitation.
2. A compound contains carbon, hydrogen and oxygen. Explain stepwise how empirical formula and molecular formula are determined experimentally.
3. Discuss the importance of stoichiometry in industrial chemistry with suitable examples.

### Section D: Numerical Questions

1. A hydrocarbon contains 85.7% carbon and 14.3% hydrogen. Its molar mass is  $56 \text{ g mol}^{-1}$ . Determine its empirical and molecular formula.
2. 12 g magnesium reacts with 20 g oxygen according to:  
 $2\text{Mg} + \text{O}_2 \rightarrow 2\text{MgO}$   
Calculate the limiting reagent and mass of MgO formed.
3. Calculate the number of atoms present in 4.4 g of carbon dioxide.
4. A compound contains 40% carbon, 6.7% hydrogen and 53.3% oxygen. Determine its empirical formula.

5. Calculate the number of moles present in 44 g of carbon dioxide (CO<sub>2</sub>).
6. A compound contains 40% carbon, 6.7% hydrogen and 53.3% oxygen. Determine its empirical formula.
7. Calculate the number of molecules present in 18 g of water (H<sub>2</sub>O).
8. In the reaction:  $2\text{H}_2 + \text{O}_2 \rightarrow 2\text{H}_2\text{O}$   
If 4 g of hydrogen reacts with 40 g of oxygen, identify the limiting reagent.
9. 5.6 g of iron reacts with excess hydrochloric acid according to the equation:  
$$\text{Fe} + 2\text{HCl} \rightarrow \text{FeCl}_2 + \text{H}_2$$
  
Calculate the mass of hydrogen gas produced.

## Assignment 2

### Chapter 2: Structure of Atom

#### Section A: Case Study Based Questions

##### Case Study

During an experiment in a discharge tube, a scientist observed cathode rays moving towards the positive plate. Later, another scientist performed alpha particle scattering experiment and concluded that most of the space inside an atom is empty.

##### Questions

1. Name the scientist associated with cathode ray experiment.
2. What conclusion was drawn from Rutherford's alpha scattering experiment?
3. Why was Thomson's model unable to explain Rutherford's observations?

---

#### Section B: Short Answer Type Questions

1. Why do electrons not lose energy while revolving in Bohr's permitted orbits?
2. Explain why 2s orbital has lower energy than 2p orbital.
3. Why is Heisenberg's Uncertainty Principle important in quantum mechanics?

---

#### Section C: Long Answer Type Questions

1. Compare Thomson's atomic model and Rutherford's atomic model on the basis of structure and limitations.
  2. Explain Bohr's model of hydrogen atom and discuss its achievements and limitations.
  3. Describe the significance of quantum numbers in determining electronic configuration.
-

## Section D: Numerical Questions

1. Calculate the energy of a photon having wavelength 500 nm.
2. The frequency of radiation emitted by hydrogen atom is  $6 \times 10^{14}$  Hz. Calculate its wavelength.
3. Calculate the maximum number of electrons possible in: (a) N-shell (b) 4d subshell
4. Write the electronic configuration of: (a) Chromium ( $Z = 24$ ) (b) Copper ( $Z = 29$ )
5. Calculate the energy of radiation having wavelength 300 nm. Use:  $E = \frac{hc}{\lambda}$
6. An electron in a hydrogen atom jumps from  $n = 5$  to  $n = 2$ . Name the spectral series formed and identify whether energy is absorbed or emitted.
7. Calculate the maximum number of electrons possible for:
  - (a) Principal quantum number  $n = 3$
  - (b) Subshell  $d$
8. The wavelength of a radiation is  $6 \times 10^{-7}$  m. Calculate its frequency. Use:  $c = \nu\lambda$
9. Write the electronic configuration of the following ions and identify whether they are isoelectronic:
  - (a)  $\text{Na}^+$
  - (b)  $\text{Mg}^{2+}$
  - (c)  $\text{F}^-$

IP

### June Home assignment (Practical file of MQ SQL )

1. Create Database Named Class11
2. Open Database Class 11
3. Create a student table with the student id, class, section, gender, name, dob, and marks as attributes where the student id is the primary key.
4. View the structure of the table
5. Insert the details of at least 10 students in the above table.
6. Display the details of the student table.
7. Delete record of students who secured less than 65 marks.
8. Increase marks by 5% for who have studentid more than 1105.

	<p>9.Display the content of the table of female students.</p> <p>10.Displaystudentid, Name and Marks whose marks are more than 50.</p> <p>11.Find the average of marks from the student table.</p> <p>12.Find the number of students, who are from section 'A'.</p> <p>13.Add a new column email in the above table.</p> <p>14.Add the email ids of each student in the created email column.</p> <p>15.Display the information of all the students, name contains 'sh'</p> <p>16.Display the information of all the students, name starts with 'sh'</p> <p>17.Display studentid, Name, DOB of who are born in 2005</p> <p>18.Displaystudentid, Name, DOB, Marks, Email of male students in ascending order of their names.</p> <p>19.To find average of marks from the students</p> <p>20.Drop table.</p> <p>21. Drop Database.</p>
<p><b>Mathematics</b></p>	<p><b>Q1. A school conducted a survey among 100 students regarding participation in two sports: Basketball and Football.</b></p> <ul style="list-style-type: none"> <li>• <b>58 students play Basketball</b></li> <li>• <b>42 students play Football</b></li> <li>• <b>18 students play both games</b></li> </ul> <p><b>Based on the above information, answer the following:</b></p> <p><b>Represent the information using a Venn diagram.</b></p> <ol style="list-style-type: none"> <li><b>1. Find the number of students who play only Basketball.</b></li> <li><b>2. Find the number of students who play only Football.</b></li> <li><b>3. Find the number of students who play neither game.</b></li> <li><b>4. If one more sport Cricket is introduced, explain how set theory becomes useful in analysing the data.</b></li> </ol> <p><b>Q2. Let <math>A = \{x: x \text{ is a factor of } 24\}</math> and <math>B = \{x: x \text{ is a prime number less than } 15\}</math></b></p> <p><b>Answer the following:</b></p> <ol style="list-style-type: none"> <li><b>1. Write A and B in roster form.</b></li> <li><b>2. Find: <math>A \cap B</math>, <math>A \cup B</math>, <math>A - B</math>, <math>B - A</math>.</b></li> </ol>

**3. Verify whether:  $B \subseteq A$**

**4. Find:  $(A - B) \cup (B - A)$**

**Q3. A company assigns exactly one employee ID to each employee.**

- 1. Explain why this assignment represents a function.**
- 2. Identify the domain and codomain.**
- 3. Can two employees have the same employee ID? Justify.**
- 4. Can one employee have two employee IDs? Explain mathematically.**

**Q4. The temperature in a city on a particular day is given by:  $T(x) = 2x + 18$  where  $x$  represents time in hours after sunrise. Find:**

- 1. Temperature after 3 hours.**
- 2. Temperature after 8 hours.**
- 3. Time when temperature becomes  $30^\circ C$ .**

**Q5. If  $z_1 = 5 + 3i$ ,  $z_2 = 2 - 7i$  Find:  $z_1 + z_2$ ,  $z_1 - z_2$ ,  $z_1 z_2$ , Conjugate of  $z_2$ .**

**Q6. A factory manufactures water bottles.**

**Profit per bottle = ₹35, Daily fixed expenditure = ₹4200. The owner wants profit greater than ₹7000.**

- 1. Form the inequality.**
- 2. Find the minimum number of bottles required.**
- 3. Represent the solution on number line.**

**Q7. Solve:  $\frac{3x-4}{2} \leq 5$  and represent the solution set on number line.**

**Q8. From 8 boys and 6 girls, a committee of 5 students is to be formed.**

**Find the number of ways in which the committee can be formed if:**

- 1. No restriction is given.**
- 2. Exactly 2 girls are included.**
- 3. At least 3 boys are included.**

**Q9. Find the coordinates of a point P which is equidistant from four points O(0,0,0), A(a,0,0), B(0,b,0) and (0,0,c).**

**Q10. Find the value of x and y, if  $\frac{(1+i)x-2i}{3+i} + \frac{(2-3i)y+i}{3-i} = i$**

**Q11. A manufacturer has 600 litres of a 12% solution of acid. How many litres 30% acid solution must be added to it so that acid content in the resulting mixture be more**

	<p>than 15% but less than 18%.</p> <p><b>Q12. The three sides of a triangle are given by <math>(2x+3)</math> cm, <math>(4x-1)</math> cm and 14 cm on the basis of this, answer the following. (i) If the perimeter of triangle is at least 34 cm, then what is the minimum value of <math>x</math>? (ii) If the perimeter of triangle is at most 82 cm, then what is the maximum value of <math>x</math>? (iii) As we know that the sum of two sides in a triangle is greater than third side so find <math>x</math> if <math>(2x+3) + (4x-1) &gt; 14</math> and represent the solution on number line.</b></p>
<b>Music</b>	<p>Unit - Swara , Saptak,Thaat,and Margi Sangeet</p> <p>Unit -2Dhrupad.</p> <p>Unit – 3Life sketch Tansen and V.N.Bhatkhandebhi</p> <p>Unit -4TaalEktala and Teentala</p> <p>Unit -5Rag Bihag and Bhairavi</p> <p>and project File</p>

## Physics

### ASSIGNMENT 1: UNITS AND MEASUREMENTS

1. A particle is in a unidirectional potential field where the potential energy (U) of a particle depends on the x-coordinate given by  $U_x = k(1 - \cos ax)$  & k and 'a' are constants. Find the physical dimensions of 'a' & k.
2. The equation for the speed of sound in a gas states that  $v = \sqrt{\gamma K_B T / m}$ . Speed v is measured in m/s,  $\gamma$  is a dimensionless constant, T is temperature in kelvin (K), and m is mass in kg. Find the SI unit for the Boltzmann constant,  $K_B$ ?
3. The time period (T) of a spring mass system depends upon mass (m) & spring constant (k) & length of the spring (l)  $\left[ k = \frac{\text{Force}}{\text{length}} \right]$ . Find the relation among T, m, l & k using dimensional method.
4. The distance moved by a particle in time t from centre of a ring under the influence of its gravity is given by  $x = a \sin \omega t$ , where a &  $\omega$  are constants. If  $\omega$  is found to depend on the radius of the ring (r), its mass (m) and universal gravitational constant (G). Using dimensional analysis find an expression for  $\omega$  in terms of r, m and G.
5. A satellite is orbiting around a planet. Its orbital velocity ( $v_0$ ) is found to depend upon  
(A) Radius of orbit (R)  
(B) Mass of planet (M)  
(C) Universal gravitation constant (G)  
Using dimensional analysis find an expression relating orbital velocity ( $v_0$ ) to the above physical quantities.
6. Given  $\vec{F} = \frac{\vec{a}}{t}$  where symbols have their usual meaning. The dimensions of a is.
7. Assume that the largest stone of mass 'm' that can be moved by a flowing river depends upon the velocity of flow v, the density d & the acceleration due to gravity g. If 'm' varies as the  $K^{\text{th}}$  power of the velocity of flow, then find the value of K.
8. The equation of state for a real gas at high temperature is given by  $P = \frac{nRT}{V-b} - \frac{a}{T^{1/2}V(V+b)}$  where n, P, V & T are number of moles, pressure, volume & temperature respectively & R is the universal gas constant. Find the dimensions of constant a in the above equation.
9. If Energy (E), velocity (v) and time (T) are fundamental units. What will be the dimension of surface tension?
10. In system called the star system we have 1 star kilogram =  $10^{20}$  kg. 1 starmeter =  $10^8$  m, 1 starsecond =  $10^3$ s then calculate the value of 1 joule

## Assignment 2

### ASSIGNMENT (SUBJECTIVE)

#### MOTION IN A STRAIGHT LINE

1. A particle starts from point A with constant speed  $v$  on a circle of radius  $R$ . Find magnitude of average velocity during its journey from: -



a.) A to B

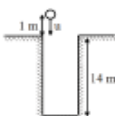
b.) A to C

c.) A to D

2. A particle is moving along  $x$ -axis. Initially it is located 5 m left of origin and it is moving away from the origin and slowing down. In this coordinate system, what are the signs of the initial velocity and acceleration.



3. A car accelerates with uniform rate from rest on a straight road. The distance travelled in the last second of a three second interval from the start is 15 m then find the distance travelled in first second in m.
4. A particle moving in one-dimension with constant acceleration of  $10 \text{ ms}^{-2}$  is observed to cover a distance of 100 m during a 4s interval. How far will the particle move in the next 4s?
5. A particle starts from rest at  $t = 0$  and  $x = 0$  to move with a constant acceleration  $= +2 \text{ ms}^{-2}$ , for 20 seconds. After that, it moves with  $-4 \text{ ms}^{-2}$  for the next 20 seconds. Finally, it moves with positive acceleration for 10 seconds until its velocity becomes zero.
- What is the value of the acceleration in the last phase of motion?
  - What is the final  $x$ -coordinate of the particle?
  - Find the total distance covered by the particle during the whole motion.
6. A body moving with uniform acceleration has a velocity of  $-11 \text{ cm/s}$  when its  $x$  coordinate is 3.00 cm. If its  $x$  coordinate 2 s later is  $-5 \text{ cm}$ , what is the magnitude in  $\text{cm s}^{-2}$  of its acceleration?
7. A driver travelling at speed  $36 \text{ kmh}^{-1}$  sees the light turn red at the intersection. If his reaction time is 0.6s, and then the car can decelerate at  $4 \text{ ms}^{-2}$ . Find the stopping distance of the car.
8. The window of the fourth floor of building is 5 m high. A man looking out of the window sees an object moving up and down the height of window for 2 sec. Find the height that the object reaches from the top end of the window.
9. A body is dropped from a height of 300 m. Exactly at the same instant another body is projected from the ground level vertically up with a velocity of  $150 \text{ ms}^{-1}$ . Find when they will meet.
10. A stone is dropped from the top of a tall cliff, and 1s later a second stone is thrown vertically downward with a velocity of  $20 \text{ ms}^{-1}$ . How far below the top of the cliff will the second stone overtake the first?
11. Speed of train is increasing linearly with time. The train passes a hut with speed  $2 \text{ m/s}$  and acquires a speed of  $12 \text{ m/s}$  after 10 s. What is the speed of the train in  $\text{m/s}$ , 5 s after passing the hut?
12. Two particle A and B are moving in same direction on same straight line. A is ahead of B by 20m. A has constant speed  $5 \text{ m/sec}$  and B has initial speed  $30 \text{ m/sec}$  and retardation of  $10 \text{ m/s}^2$ . Then if  $x$  (in m) is total distance travelled by B as it meets A for second time. Then value of  $x$  will be.
13. A boy throws a ball with speed  $u$  in a well of depth 14 m as shown. On bounce with bottom of the well the speed of the ball gets halved. What should be the minimum value of  $u$  (in  $\text{m/s}$ ) such that the ball may be able to reach his hand again? It is given that his hands are at 1 m height from top of the well while throwing and catching.



14. From the top of a tower, a ball is thrown vertically upwards. When the ball reaches  $h$  below the tower, its speed is double of what it was at height  $h$  above the tower. Find the greatest height attained by the ball from the tower.
15. A rocket is fired vertically upwards with initial velocity  $40 \text{ m/s}$  at the ground level. Its engines then fired and it is accelerated at  $2 \text{ m/s}^2$  until it reaches an altitude of  $1000 \text{ m}$ . At that point the engines shut off and the rocket goes into free-fall. If the velocity (in  $\text{m/s}$ ) just before it collides with the ground is  $40\alpha$ . Then fill the value of  $\alpha$ . Disregard air resistance ( $g = 10 \text{ m/s}^2$ ).
16. A balloon rises from rest on the ground with constant acceleration  $\frac{g}{3}$ . A stone is dropped when the balloon has risen to a height  $60 \text{ meter}$ . The time taken by the stone to reach the ground is.
17. The position  $x$  of a particle w.r.t. time  $t$  along  $x$ -axis is given by  $x = 9t^2 - t^3$  where  $x$  is in metre and  $t$  in second. Find
- Maximum speed along  $+x$  direction
  - Position of turning point
  - Displacement in first ten seconds
  - Distance travelled in first ten seconds
18. The momentum of a particle moving in straight line is given by  $p = \ln t + \frac{1}{t}$  (in  $\text{kg m/s}$ ), find the time  $t > 0$  at which the net force acting on particle is  $0$  and its momentum at that time. [Hint:  $F = \frac{dp}{dt}$ ].
19. The velocity of the particle is given as  $v = 3t^3 + t - \frac{1}{t^2}$ . Calculate the net force acting on the body at time  $t = 2 \text{ sec}$ , if the mass of the body is  $5 \text{ kg}$ .
20. A wheel rotates so that the angle of rotation is proportional to the square of time. The first revolution was performed by the wheel for  $8 \text{ sec}$ . Find the angular velocity  $\omega$ ,  $32 \text{ sec}$  after the wheel started. [Hint: Consider  $\theta = kt^2$ , find  $k$ ]
21. The charge flowing through a conductor beginning with time  $t = 0$  is given by the formula  $q = 2t^2 + 3t + 1$  (coulombs). Find the current  $i = \frac{dq}{dt}$  at the end of the  $5^{\text{th}}$  second.
22. The angle  $q$  through which a pulley turns with time  $t$  is specified by the function  $\theta = t^2 + 3t - 5$ . Find the angular velocity  $\omega = \frac{d\theta}{dt}$  at  $t = 5 \text{ sec}$ .
23. The motion of a particle in a straight line is defined by the relation  $x = t^4 - 12t^2 - 40$  where  $x$  is in meters and  $t$  is in sec. Determine the position  $x$ , velocity  $v$  and acceleration  $a$  of the particle at  $t = 2 \text{ sec}$ .
24. A point moves in a straight line so that its distance from the start in time  $t$  is equal to
- $$s = \frac{1}{4}t^4 - 4t^3 + 16t^2,$$
- At what times was the point at its starting position?
  - At what times is its velocity equal to zero?
25. A body whose mass is  $3 \text{ kg}$  performs rectilinear motion according to the formula  $s = 1 + t + t^2$ , where  $s$  is measured in  $\text{cm}$  &  $t$  in  $\text{seconds}$ . Determine the kinetic energy  $\frac{1}{2}mv^2$  of the body in  $5 \text{ sec}$  after its start.
26. A force of  $40 \text{ N}$  is responsible for the motion of a body governed by the equation  $s = 2t + t^2$ , where  $s$  is in meters and  $t$  in sec. What is the momentum of the body at  $t = 2 \text{ sec}$ ? [Hint: Find acc. then  $m = \frac{F}{a}$  &  $p = mv$ ]
27. The angle rotated by a disc is given by  $\theta = \frac{2}{3}t^3 - \frac{25}{2}t^2 + 77t + 5$ , where  $\theta$  is in rad and  $t$  in seconds.
- Find the times at which the angular velocity of the disc is zero.
  - Its angular acceleration at these times.
28. The acceleration of a particle starting from rest vary with respect to time is given by  $a = (2t - 6)$ , where  $t$  is in seconds. Find the time (in seconds) at which velocity of particle in negative direction is maximum.

29. Acceleration of a particle is defined as  $a = (75V^2 - 30V + 3)(m/s^2)$ . If the constant speed achieved by the particle is given by  $V_c$ , then find the value of  $10V_c$ .
30. Position vector of a particle is given by  $\vec{r} = 3t^3\hat{i} + 4t\hat{j} + t^2\hat{k}$ . Find the average acceleration of particle from  $t = 1$  s to  $t = 2$  sec.
31. In the following graph variation with time (t), in velocity (v) of a particle moving rectilinearly is shown. What is average velocity in m/s of the particle in time interval from 0 s to 4 s?



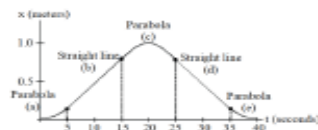
32. The graph illustrates motion of a bucket being lowered into a well from the top at the instant  $t = 0$ , down to the water level, filled with water and drawn up again. Here 'x' is the depth. Find the average speed of the bucket in m/s during whole operation.



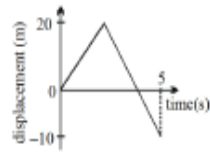
33. A particle moves along a straight line, x. At time  $t = 0$ , its position is at  $x = 0$ . The velocity, V, of the object changes as a function of time t, as indicated in the figure; t is in seconds, V in m/sec and x in meters.
- What is x at  $t = 3$  sec?
  - What is the instantaneous acceleration (in  $m/sec^2$ ) at  $t = 2$  sec?
  - What is the average velocity (in m/sec) between  $t = 0$  and  $t = 3$  sec?
  - What is the average speed (in m/sec) between  $t = 1$  and  $t = 3$  sec?



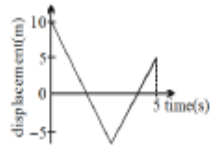
34. The figure below is a displacement vs time plot for the motion of an object, answer questions (a) & (b) with the letter of appropriate section of the graph.
- Which section represents motion in the forward direction with positive acceleration?
  - Which section represents uniform motion backwards (-x direction)?



35. (a) The diagram shows the displacement-time graph for a particle moving in a straight line. Find the average velocity for the interval from  $t = 0$  to  $t = 5$ .



(b) The diagram shows the displacement-time graph for a particle moving in a straight line. Find the average speed for the interval from  $t = 0$  to  $t = 5$ .



36. Figure shows a graph of acceleration of a particle moving on the  $x$ -axis. Plot the following graphs if the particle is at origin and at rest at  $t = 0$ .

- velocity-time graph
- displacement-time graph
- distance-time graph.

