

**CLASS-XI**  
**ACCOUNTANCY**  
**HOLIDAY HOMEWORK**

A) Visit any one shop, mall, showroom, office, bank, restaurant, or any other business organisation in your locality. Observe and collect information about at least **15 business transactions** that take place in that organisation.

1. Introduction of the organisation visited
2. Date and purpose of the visit
3. Description of at least 15 transactions observed or collected
4. Identify the accounts involved in each transaction
5. Classify the accounts into:
  - Personal Account
  - Real Account
  - Nominal Account
6. Mention the nature of each account (Asset, Liability, Expense, Income, etc.)
7. Apply the rules of debit and credit for each transaction
8. Write a brief conclusion about what you learned from the visit

Do it in Accountancy Notebook.

B) Answer the following Questions in your Accountancy Notebook.

1. What is the traditional function of Accounting?
2. Is the basic objective of Book-keeping to maintain systematic records or to ascertain net results of operation of financial transactions?
3. Recording of financial transactions and preparing the financial statements are the only objectives of accounting. Do You agree?
4. On 1st Jan, 2024, Mr. Vasudev was appointed as Marketing Manager of the firm with a salary of Rs. 2,00,000 per month. State whether this event will be recorded in the books of accounts?
5. A firm follows a practice of giving the figures of previous year along with the figures of current year. Now the Accountant of the firm wants to discontinue this practice. Do you justify this decision?
6. Give two examples of transactions which are not recorded in accounting.
7. A firm has received a large order to supply the goods. Will it be recorded in the books?
8. Mr. Solkar, the proprietor of a business, sold his residential bouse for Rs. 4 Crore. Will it be recorded in the books of accounts?
9. Miss Kavya, an electronic goods dealer, gifted a washing machine valued 50,000 to her friend Suruchi. Will it be recorded in the books of accounts?
10. How is accounting influenced by personal Judgements
11. Mr. Ratnakar established a Travel Agency. Over the years the Travel Agency earned high reputation. Mr. Ratnakar considers the value of goodwill of his Travel Agency at Rs. 5 Crore. He wants to record the value of the goodwill in the books of accounts. Can he do so?
12. What is meant by qualitative information?
13. Huge loss occurred due to the strike by employees. Will it be recorded?

14. If the accounting information is not clearly presented, which of the qualitative characteristic of the accounting information is violated?
15. Confidence and trust that the reported information is a reasonable representation of the actual items and events, that have occurred, depicts which qualitative characteristic of accounting information.
16. Which value is most important for a good accountant?
17. The accountant of the firm found an error in the books of accounts but neither he rectified the error nor disclosed it to the management fearing that it will risk his job. Which value has been violated by the accountant?
18. Accounting records business transactions and events which are of financial nature. Do you consider it a limitation of accounting?
19. Godrej Ltd. imported from Germany one machinery for sale in India and another machinery for production purpose. Will you treat them goods or fixed assets?
20. Mr. Jaspal Singh dealing in electronic goods sold 20 TV sets costing ₹50,000 each at ₹60,000 each. Out of this ₹8,00,000 were received in cash and the balance is not yet received. State the amount of revenue.
21. Mr. Dinanath who owed us ₹50,000 became insolvent and paid only 40% of this amount. What is term used for the amount not received.
22. Why assets are classified into current and non- current?
23. Why receipts are classified into capital and revenue?
24. Why expenditure is classified into capital and revenue.
25. What is the reason that the capital expenditure is shown in the Balance Sheet?
26. What is meant by GAAP?
27. Proprietor of the business is treated as creditor to the extent of his capital under which Concept?
28. A customer of X Ltd. has discontinued his business. He used to purchase 30% of the total goods produced by X Ltd. Is it a relevant information in your opinion and should be disclosed by X Ltd.
29. X Ltd. gets a contract of ₹100 crore to build a Shopping-Mall to be completed in 3 years. The management of the company wants to ascertain profit or loss on this contract only when the contract is completed. Is the management justified?
30. Under which principle the calibre or quality of the management is not disclosed in the balance sheet?
31. Which accounting principle states that all anticipated losses should be recorded but all anticipated profits should be ignored?
32. According to which concept, depreciation is to be charged as per one particular method year after year?
33. Why the full cost of an asset is not treated as an expense in the year of its purchase?
34. During the year the company purchased ballpoint pens of ₹500. These were issued to employees and were still in use at the end of the year. Which accounting concept you would follow in dealing with this item?
35. A debtor who owes two lacs to the Company is rumoured to be declared insolvent. Will you disclose this information in the books?

36. Goods withdrawn by the proprietor for his personal use has not been recorded in the books of accounts. Which accounting concept has been violated?
37. In a business provision for doubtful debts is created 85% on debtors every year. Name the two accounting principles followed in this process.
38. A firm has stationery stock amounting to ₹400 as at the end of financial year, Accountant of the firm has written it off to Profit & Loss Account. Is he right in doing so?
39. Why closing stock is valued at cost price or realisable value whichever is less?
40. Identify the value involved in the assumption of going concern.
41. Why fixed assets are not shown in the books at market value?
42. Why the entire life of the business enterprise is divided into time-interval.
43. A company purchased goods for ₹5,00,000 and sold 80% of such goods during the year. The market value of remaining goods was ₹290,000. The company valued the closing stock at cost. Which principle is being violated?
44. On 25th March, 2023, a fire broke out in the premises of Kamal Ltd and destroyed a part of its plant and machinery. On account of this, a sharp decline in production for the next six months is expected. The company did not disclose this fact in its annual report for the year ended 31st March, 2021. What is your opinion about this omission?
45. X Ltd. purchased 500 Sq. Metre Land for 1.5 crore to build a factory. At the end of year, the market value of land was 1.35 crore. Ltd. treated 15 Lakh at loss and recorded the land at 1.35 crore. Is it a correct treatment?
46. Y Ltd. purchased securities for ₹50 lakh. At the end of the year, the market value of such securities was ₹40 lakh. While preparing the financial statements. the company valued the securities at cost i.e. at ₹50 lakh is it a correct treatment?
47. A Company has been charging depreciation at 10% pa on original cost method. It now wants to change the method from original cost to diminishing balance method, the rate of depreciation being 15% pa. Can it do so?
48. Mohan, the owner of a business receives an order for supply of goods worth ₹2,00,000. He has also received ₹25,000 against this order. Mohan wants to record it as a sale. Is Mohan correct in doing so?
49. Land and Buildings are shown at ₹10 Lac in the Balance Sheet of the business owned by Mr. Yuvraj. However, as per the certificate of Govt, approved valuer the realisable value of Land and Building is ₹200 Lac. Mr. Yuvraj wants to show the Land and Building at this value in his books. Can he do so?
50. Shyam purchased a building for ₹20 lakh. After a period of five years, the depreciation charged on the building amounted to ₹3 lakh. However, due to boom in the property market, the current market value of the building is ₹28 lakh. State the value at which building should be recorded in the books of accounts. Also, give reasons for the same.

# BIOLOGY HOLIDAY'S HOMEWORK

## CLASS XI

2026-2027

- **Complete the Assignments from Ch-Biological Classification and Ch- Animal Kingdom in your Classwork Notebook.**
- **Complete the Experiments in Biology Practical File.**

### ASSIGNMENT I ANIMAL KINGDOM

**M.M.:25**

1. Name the phylum in which the animals have incomplete digestive system i.e. have only a single opening to the outside of the body that serves as both mouth and anus. 1
2. Name the phylum in which the adults exhibit radial symmetry but larvae are bilaterally symmetrical. 1
3. An undifferentiated layer is present in between the ectoderm and endoderm of some animals. Name the layer and term used for organisation of such animals. 1
4. Define the phenomenon 'metamerism'. 1
5. Give two characteristic features of notochord found in some animals. 1
6. Give two unique features found in animals which belong to phylum porifera.  $\frac{1}{2} + \frac{1}{2} = 1$
7. Cnidarians exhibit two basic body forms called polyp and medusa. Write one characteristic of each form. Also give example of one animal which exhibit these forms. 1
8. Fill in the blank spaces with appropriate words/terms. 1

S.No.	Phylum/Class	Excretory organ	Circulatory organ
1.	Arthropoda	(A) _____	Open
2.	Annelida	Nephridia	(B) _____
3.	(C) _____	Metanephridia	Open
4.	Amphibia	(D) _____	Closed

9. Differentiate between the following by giving characteristic feature of each:  $\frac{1}{2} \times 4 = 2$ 
  - i. Urochordata and cephalochordate
  - ii. Direct and indirect development
10. Give an example of each :
  - i. An animal with cnidoblasts
  - ii. An animal having canal system and spicules

iii. An animal having dry and cornified skin

iv. An animal with bioluminescence

$\frac{1}{2} \times 4 = 2$

11. Name the:

i. Excretory organs of animals of Phylum Arthropoda

ii. Second largest phylum

iii. Term used for warm blooded animals

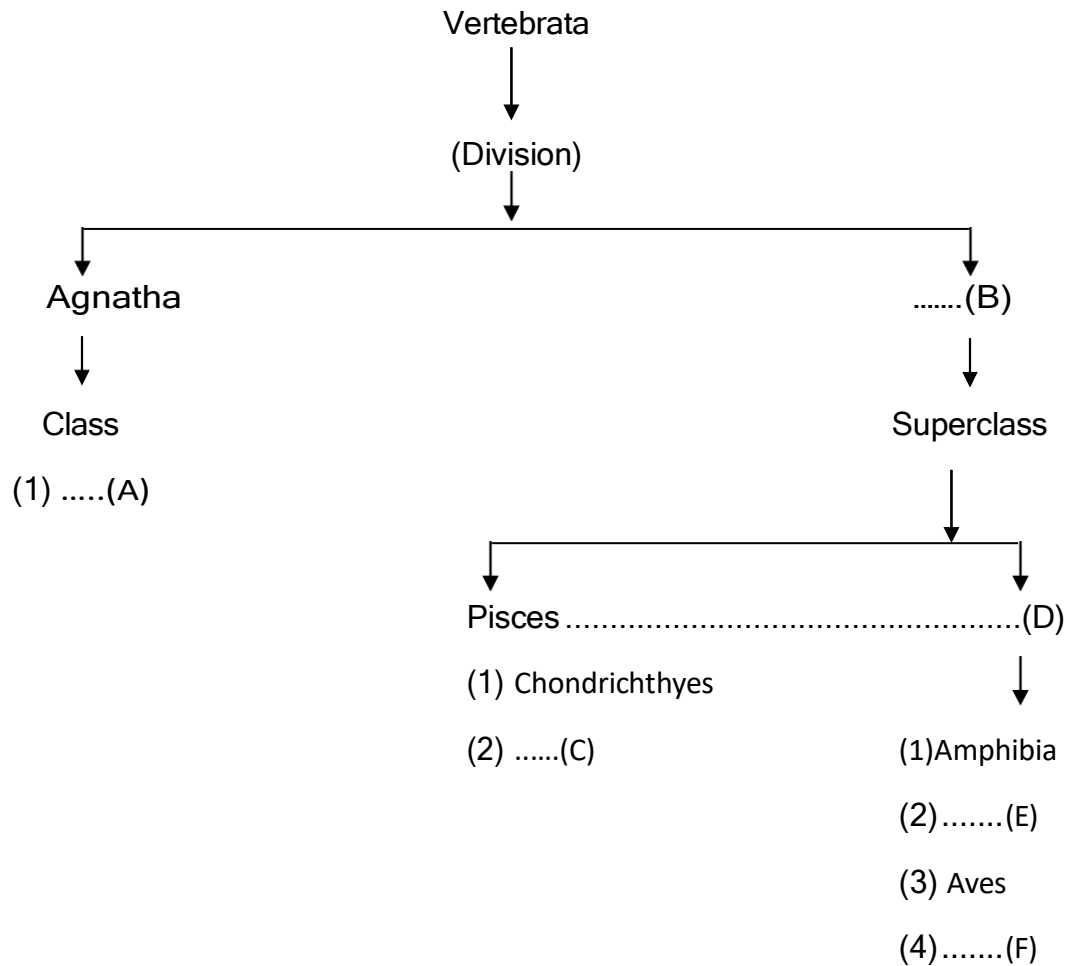
iv. Additional chambers found in the digestive tract of aves.

12. List 6 characteristic features of animals belong to class mammalian.

$\frac{1}{2} \times 6 = 3$

13. Give three points of difference between chordate and non-chordata.

14. Complete the following flowchart with appropriate words:



$\frac{1}{2} \times 6 = 3$

**ASSIGNMENT II**  
**BIOLOGICAL CLASSIFICATION**

1. Name the scientist who proposed the five kingdom system of biological classification. Also name the kingdom which consists of unicellular organisms that are prokaryotic. 1
2. What name is given to the protein coat of viruses? What is the term used to denote the subunits of this protein coat? 1
3. Write the scientific names of the following fungi: 1
  - (a) A parasite on mustard
  - (b) Causative organism of rust of various plants
4. What is referred to as the phycobiant in a lichen? What is its role in this association? 1
5. What is the causative organism of potato spindle tuber disease? How does it differ from a virus? 1
6. Name any two organisms which were earlier considered algae, but are now placed in the kingdom protista. 1
7. Name the following:
  - a. The fusion of protoplasts between two motile or non-motile gametes during the sexual cycle of a fungus
  - b. The smallest organisms that lack cell wall and can survive without oxygen 2
8. Name the major groups of protozoa. 2
9. Give an example of a dinoflagellate. What is the typical arrangement of flagella in this organism? 2
10. Write one economic importance of each of these: 2
  - (a) Anabena
  - (b) Methanogens
  - (c) Diatoms
  - (d) Neurospora
11. Differentiate between basidiomycetes and ascomycetes. 3
12. What type of nutrition do slime moulds show? How is their growth under suitable conditions different from that under unfavourable conditions? 3
13. Define the following and give one example of each from the kingdom Protista: 3
  - (a) Saprophytes
  - (b) Parasites
  - (c) Symbionts

**HOLIDAY HOMEWORK**  
**CLASS XI**  
**BUSINESS STUDIES**

1. Earning profit is considered to be an essential objective of every business because:
  - a) It is an important source of finance for meeting expansion needs of business.
  - b) It indicates that the business is being run efficiently.
  - c) It helps to build up the goodwill of the business.
  - d) All of the above.
2. Business risk is not likely to arise due to
 

a) Changes in government policy	c) Good management
b) Employee dishonesty	d) Power failure
3. There are two statements marked as Assertion (A) and Reason (R). Read the statements and choose the appropriate option from the options given below:
  - i. *Assertion (A)* – A partner by estoppel has unlimited liability.  
*Reason (R)* – A partner by estoppel is an individual who through his own behaviour or conduct lets the outsider believe that he is a partner in the business and thus, creates an impression of being a partner before the other firm.
  - ii. *Assertion (A)*: Partnership firm lacks continuity of business.  
*Reason (R)*: Partnership firm is not legally required to publish its financial reports.
    - A. Both (A) and (R) are incorrect.
    - B. (A) is correct and (R) is incorrect.
    - C. Both (A) and (R) are correct and (R) is the correct explanation of (A).
    - D. Both (A) and (R) are correct but (R) is not the correct explanation of (A).
4. From the following picture, which hindrance of commerce is removed?



5. Name the certificate which authorizes a registered partnership to start its business.
6. Biju Sarkar has three sons, Mayur, Aniket and Nikhil. Biju Sarkar owns a huge commercial complex in Kolkata. His three sons inherit his commercial complex. The three sons of Biju Sarkar are:
 

a) Members	b) Shareholders	c) Coparceners	d) Partners
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7. State True or False and give reasons in support of your answer:
  - a) Business activities are economic activities but all economic activities are not always business activities.
  - b) An example of economic activity: a person wishes to sell his old car to buy a new car.
  - c) Banking is not a manufacturing industry.
  - d) Business risk due to natural causes can be controlled.
  - e) The seasonal change happens to be the natural type of business risk.
  - f) Employment involves greater risk than business.

8. Match the following:

I.

COLUMN I	COLUMN II
A. Partnership	i) Government control
B. Joint Hindu family business	ii) Possibility of conflicts
C. Cooperative society	iii) Limited resources
D. Sole proprietorship	iv) Unlimited liability of Karta

II.

COLUMN I	COLUMN II
A. Indian Partnership Act	i) 1912
B. Hindu Succession Act	ii) 1932
C. Cooperative Societies Act	iii) 1956

9. There is always a possibility of losses being incurred in spite of the best efforts put into the business. Characteristic of business referred here is \_\_\_\_\_.
10. Avantika wanted to pitch in to reduce the financial crisis prevailing in her house and thought of working as a cook. She started working in three different households, one Punjabi, one Gujrati and one South Indian family. She soon realised that all the three households had different cuisine. It was indeed a challenge for her to learn the techniques of the cuisine. All the families greatly appreciated the time frame within which she had mastered the local cuisine. After working for them for a year, she decided to open a small eating joint of her own along with two of her friends by the name 'Eat point'. They decided to share profits and losses equally and that each of them will be liable for acts performed by the other two. Soon the eatery became a hot spot because of the fusion platter which was being offered. On the basis of the given information, identify the type of business organisation which was set up by Avantika and her friends.
11. This cooperative society consists of small producers who find it difficult to sell their products at profit. The output of all producers is brought together and sold at best price. It performs various functions like transportation, warehousing, grading, etc. Identify the type of Co-operative Society.
12. Vinay and Sanya found an unclaimed wrist watch in the canteen area of their school. They decided to sell it and share the profits equally. Can it be regarded as Partnership? Why?
13. The following cases highlight the various situations in which entrepreneurs suffered huge losses. Identify the cause of business risk indicated in the given cases:
- Alok imported some raw material for his production from Ukraine. Due to war, trade with Ukraine has stopped and Alok is facing severe shortage of raw material for manufacturing his products.
  - Manan is a leading manufacturer of basic keypad mobiles. However, demand for such mobiles drastically decreased after the origin of smartphones.
  - Craft Ltd. is known for its technically advanced gadgets. The company is planning to launch the latest model of speakers, which is not yet released in India. However, before the company could bring out its model, the same type of speaker was launched by one of its competitors. On scrutiny, it was discovered that one of the employees shared the technical aspects of the speaker with the competitor.
14. "Earning of profit cannot be the objective of business any more than the eating is the objective of living." Do you agree with this statement? Give reasons in support of your answer.

15. Manav and Kabir decide to start a partnership business of manufacturing computer keyboards. Manav is of the view that they should have a written agreement and they should also register their partnership firm. However, Kabir wants to have a verbal agreement. Manav explained the consequences of non-registration to Kabir, after which Kabir agreed it.  
State the consequences of non-registration of a firm which were explained by Manav to Kabir.
16. "Commerce is a sum total of activities that remove hindrances in the free flow of goods from producers to consumers." Explain.
17. Jyotirao Dubey operates a textile business. He has a joint family and ancestral property. All the 15 family members are a part of this business. He is the eldest member in the family so he heads the business. He is liable to all the creditors of the business as he is the decision maker. Jyotirao's grandson has just born a few days ago and he is also the member of the business.
- Which form of business is being undertaken by Jyotirao Dubey?
  - Identify and explain the features of this form of business based on the information given by quoting lines from the paragraph.
18. Param and Aryan are two friends. Both of them are doing different business. Param's business is facing the challenge of continuous change in needs and wants of consumers, change in prices and he is also very upset because of tough competition. On the other hand, a great hurdle is there in Aryan's business because of the dishonesty of employees, strikes and lockouts. Identify and explain the causes of business risk the two friends are suffering from.
19. Compare the status of a minor in a Joint Hindu Family Business with that in a partnership firm.
20. The business assets of an organisation amount to ₹ 50,000 but the debts that remain unpaid are ₹80,000.  
What course of action can the creditors take if:
- The organisation is a sole proprietorship firm.
  - The organisation is a partnership firm with Ram, Shyam, Riya and Shikha as partners. Ram is an active partner, Shyam is a Secret partner, Riya is a partner by estoppel and Shikha is a nominal partner. Who among these partners can the creditors approach for repayment of debt? Explain giving reasons.
21. Anish, Vimal and Deepak are partners in a partnership firm manufacturing air conditioner. Their firm is not registered. Recently in order to increase the profits of the firm, Vimal decided to use substandard raw material without the knowledge of Anish and Deepak. As a result, many accidents were reported by the consumers and a case has been filed against the firm.
- Is this wrong act of Vimal binding on Anish and Deepak too? State the related feature of partnership form of business organization.
  - Can Anish and Deepak file case against Vimal? Why or why not? Give a suitable reason in support of your answer.
22. Aman, Suresh and Rajeev are brothers living in a village. Aman is a farmer. He grows sugar cane in his field. Suresh is manufacturer of sugar who is doing the business with his friends Rohan and Jitender. Rajeev is a transporter. He sells the sugar in the city using his truck. This year the sugar got spoiled due to heavy rain.
- Classify the business activity undertaken by Aman, Suresh, and Rajeev.
  - What form of business organization has Suresh set up with his friends? Explain its merits and demerits.
  - Name the written agreement specifying the terms and conditions between Suresh and his friends. Explain the agreement.
  - What form of business organization is set up by Rajeev? Explain the features of this form of business organization.
  - What cause of business risk is faced by Rajeev? Explain.

23. Differentiate various types of cooperative societies on the basis of: Purpose of establishment, Members/composition, functions/Activities, Aim (means to achieve purpose) and distribution of profits.
24. A group of people in a locality of Delhi used to go for a walk in the morning. After the walk, they would often sit together and discuss the subjects like politics, demonetization, elections, market prices of different goods etc. There were about fifty persons in this group. One day, instead of other subjects, their focus of discussion was 'Market Prices of Different Goods'. During the discussion, the emphasis laid on the point was that goods become very costly by the time they reach the consumers after getting transported from the producers. Consequently, everyone's budget is getting disturbed. To get rid of this problem some people suggested that they should join together to form a society. The society would sell the goods to all the members as per their requirements after buying them in a large quantity directly from the producers. This suggestion was appreciated by them. They all became members of the society and encouraged other people also to become its members. In no time, 100 members assembled and the society was formed. The idea of forming the society immediately proved to be successful. Now their budget became balanced. A special characteristic of this society was that apart from its members it was also selling goods to the other people of the society at cheaper rates. All of them were very happy with the formation of the society.
- Identify and explain the type of cooperative society formed by them.
  - Under which act, the society must have been formed?
  - What is the liability of the members of the society so formed?
25. Identify the type of cooperative society:
- Such cooperative focuses on eliminating middlemen and improving competitive positions of its members by securing a favourable market for its products.
  - Provision of residential accommodation to the members at reasonable rates is the objective of this society.
  - Such society provides better quality seeds, fertilizers, machinery and other modern techniques for use in the cultivation of crops.
  - Teachers of various schools in South Delhi form a society to buy land and construct flats for its members.
  - Such societies protect members from exploitation of money lenders.

# Chemistry Holiday Homework

## Class- XI

Solve NCERT questions in your chemistry notebook of the following chapters:

- Some Basic Concepts of Chemistry
- Classification of Elements and Periodicity in Properties
- You are instructed to thoroughly learn the positions of all elements in the s-block and p-block of the Periodic Table. Focus on the groups, periods, symbols and placement of the elements for better understanding and quick recall.

## Periodic Table of the Elements

The periodic table is color-coded as follows:

- s-block:** Red (Groups 1 and 2)
- p-block:** Yellow (Groups 13-18)
- d-block:** Blue (Groups 3-10)
- f-block:** Green (Groups 3 and 4)
- Noble gases:** Purple (Group 18)

Key elements and their symbols are listed below:

1 H	2 He																
3 Li	4 Be	5 B	6 C	7 N	8 O	9 F	10 Ne										
11 Na	12 Mg	13 Al	14 Si	15 P	16 S	17 Cl	18 Ar										
19 K	20 Ca	21 Sc	22 Ti	23 V	24 Cr	25 Mn	26 Fe	27 Co	28 Ni	29 Cu	30 Zn	31 Ga	32 Ge	33 As	34 Se	35 Br	36 Kr
37 Rb	38 Sr	39 Y	40 Zr	41 Nb	42 Mo	43 Tc	44 Ru	45 Rh	46 Pd	47 Ag	48 Cd	49 In	50 Sn	51 Sb	52 Te	53 I	54 Xe
55 Cs	56 Ba	57 La	58 Ce	59 Pr	60 Nd	61 Pm	62 Sm	63 Eu	64 Gd	65 Tb	66 Dy	67 Ho	68 Er	69 Tm	70 Yb	71 Lu	
87 Fr	88 Ra	89 Ac	90 Th	91 Pa	92 U	93 Np	94 Pu	95 Am	96 Cm	97 Bk	98 Cf	99 Es	100 Fm	101 Md	102 No	103 Lr	

**HOLIDAY HOMEWORK**  
**CLASS XI**  
**COMPUTER SCIENCE (083)**  
**2026-27**

**Theme: “AI: Transforming the World Through Technology”**

**1. AI in Healthcare (with Technical Focus)**

- Machine Learning in disease prediction
- AI in medical image processing (X-ray, MRI)
- Role of Neural Networks in Diagnosis
- AI-powered robotic surgery systems
- Data analysis in healthcare using AI

**2. AI in Agriculture (Smart Farming)**

- AI-based crop prediction models
- Image processing for disease detection
- IoT + AI in smart irrigation
- Drone technology with AI
- Weather prediction using ML

**3. AI in Cybersecurity**

- AI in intrusion detection systems
- Machine Learning for fraud detection
- Pattern recognition in cyber threats
- Biometric authentication (face/fingerprint)
- AI in spam and phishing detection

**4. AI in Gaming & Entertainment**

- AI in game design (NPC behavior)
- Pathfinding algorithms (A\*, BFS)
- Procedural content generation
- AI in music/art generation
- Recommendation systems in streaming

## **5. AI in Environment & Climate Science**

- Climate prediction models using ML
- AI in disaster prediction
- Wildlife monitoring using AI
- Pollution detection systems
- Data analysis for sustainability

### **AI EXPLORER (Research + Creativity)**

- Each student will **choose any ONE field**:

#### **Presentation Format:**

- Canva/PowerPoint Presentation (*minimum 10 slides*)

#### **Academic Integrity Guidelines:**

Students must follow these rules strictly:

- 1. No Copy-Paste Policy**
- 2. Understand the topic and then explain it yourself**
- 3. Each student must submit individual work**

**HOLIDAY HOMEWORK**  
**CLASS XI**  
**ECONOMICS**

1. Prepare a questionnaire to collect data regarding income and expenditure of 10 households in your locality.
2. Classify and organise the data collected as a grouped frequency distribution on the basis of the following:
  - (i) Income
  - (ii) Expenditure
3. Make a table for each household by classifying the expenditure into the following :
  - (i) Food
  - (ii) Clothing
  - (iii) Rent
  - (iv) Fuel and lighting
  - (v) Education
  - (vi) Miscellaneous
4. Make the following based on the classification of expenditure done in task 3:
  - (i) Two Component bar diagrams between any two households at a time.
  - (ii) Two Percentage bar diagrams between any two households at a time.
  - (iii) One Pie Diagram each for the remaining six households.
5. Revise chapters 1 to 4 and 6 of statistics.

# **ROSARY SENIOR SECONDARY SCHOOL**

**Session 2026-27**

**Subject: English**

## **CLASS XI – HOLIDAY HOMEWORK**

Prepare a handwritten project file of approximately 10 pages on any ONE of the following topics:

1. Role of Women in Shakespearean Plays
2. Conflict Between Tradition and Modernity in Literature
3. Representation of Society in Short Stories

### **Instructions:**

- Use clear and simple language.
- Include relevant examples, quotations, pictures, or illustrations wherever suitable.
- Maintain neatness, proper formatting, and creativity.
- Original work is expected from all students.

Students will also present their project argument/topic in class for 2-4 minutes. The project will be assessed on the basis of content, presentation, language, creativity, and oral presentation.

### **PROJECT GUIDELINES**

Cover Page

Title

Index

10 Pages of Content

Conclusion

Bibliography

Paste relevant pictures related to the topic

**HOLIDAY HOMEWORK**  
**CLASS XI**  
**INFORMATICS PRACTICES (065)**  
**2026-27**

**Theme:** “*Exploring the Power of AI in Real Life*”

**AI EXPLORER (Research + Creativity)**

Each student will **choose ONE field:**

- Healthcare / Education / Agriculture / Banking / Transport / Entertainment / Environment / Cybersecurity

**Task:**

Create a **creative report (NOT plain theory)** including:

1. Introduction to AI in the chosen field
2. Real-life examples (at least 2)
3. Advantages & limitations
4. Future scope of AI
5. Ethical issues

**Presentation Format:**

- Canva/PowerPoint Presentation (*at least 10 slides*)

**Twist: Add a section:**

“A Day Without AI in This Field” (imagination-based)

**Academic Integrity Guidelines:**

Students must follow these rules strictly:

- 1. No Copy-Paste Policy**
- 2. Understand the topic and then explain it yourself**
- 3. Each student must submit individual work**

## **Holiday Homework**

### **Class XI – Mathematics**

Do the following activities from the Mathematics Lab Manual

1. To find the number of subsets of a given set and verify that if a set has  $n$  number of elements, then the total number of subsets is  $2^n$ .
2. To represent set theoretic operations using Venn diagrams.
3. To verify distributive law for three given non-empty sets A, B and C, that is,  $A \cup (B \cap C) = (A \cup B) \cap (A \cup C)$
4. To plot the graphs of  $\sin x$ ,  $\sin 2x$ ,  $2\sin x$  and  $\sin 2x$  using same coordinate axes.

## HOLIDAY HOMEWORK

### PHYSICAL EDUCATION CLASS –XI

#### PROJECT FILE

**The Content of the File as follows: -**

1. Fitness tests administration. (SAI Khelo India Test)
2. Procedure for Asanas, Benefits & Contraindications for any two Asanas for each (five) lifestyle diseases.
3. **Anyone one IOA recognized Sport/Game of student choice.**
  - a) History of the game.
  - b) Labelled diagram of Field & Equipments.
  - c) Mention its Rules.
  - d) Terminologies.
  - e) Skills.
  - f) Name of the major tournaments.
  - g) Names of the international players.

#### **IMPORTANT NOTE**

- 1. You are not allowed to use chat GPT or any other internet resources.**
- 2. Prepare this file in lab manual.**

#### PPT

**Topic – common lifestyle diseases**

**Points to cover –**

1. Introduction
2. What are diseases?
3. Common lifestyle diseases in Lakshadweep, Andaman & Nicobar islands
4. Its Causes.
5. Treatment.
6. Yogasans.

For your guidance <https://prezi.com/p/s6uvxdqmt4gk/physical-education-ail-project/>

#### **IMPORTANT NOTE**

- 1. Send your PPT on this email id [rsphysicaleducation@gmail.com](mailto:rsphysicaleducation@gmail.com).**
  - 2. Name the file with your name and class (e.g., RAHUL 11C).**
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# Physics Holiday Homework

## NOTES AND ASSIGNMENTS TO BE DONE IN NOTEBOOK

### MATHEMATICAL TOOLS

Physical constants:-

1. Mass of an electron ( $M_e$ ) =  $9.1 \times 10^{-31}$  kg.
2. Mass of a proton ( $M_p$ ) =  $1.6725 \times 10^{-27}$  kg.
3. Mass of a neutron ( $M_n$ ) =  $1.6746 \times 10^{-27}$  kg.
4. Charge of an electron ( $e$ ) =  $-1.6 \times 10^{-19}$  C
5. Speed of light in vacuum ( $c$ ) =  $3 \times 10^8$  m/sec.
6. Planck Constant ( $h$ ) =  $6.6256 \times 10^{-34}$  J x sec .
7. Universal Gravitation constant ( $G$ ) =  $6.67 \times 10^{-11}$  Nm<sup>2</sup>/ kg<sup>2</sup>.
8. Avogadro Number ( $N_A$ ) =  $6.023 \times 10^{23}$  mol<sup>-1</sup>.
9. Boltzmann constant ( $K$ ) =  $1.38 \times 10^{-23}$  J/K
10. Stefan Constant ( $\sigma$ ) =  $5.67 \times 10^{-8}$  W m<sup>-2</sup> K<sup>-4</sup>.
11. Wien Displacement Constant ( $b$ ) =  $2.898 \times 10^{-3}$  m K
12. Solar Constant ( $S$ ) =  $1.388 \times 10^3$  W m<sup>-2</sup>
13. Mass of the sun ( $M_s$ ) =  $2 \times 10^{30}$  kg.
14. Mass of the earth ( $M_E$ ) =  $5.98 \times 10^{24}$  kg
15. Radius of the earth ( $R_e$ ) = 6400 Km. =  $6.4 \times 10^6$  m.
16. Density of earth  $5.522 \times 10^3$  kg/m<sup>3</sup>.
17. Average angular velocity of the earth =  $7.29 \times 10^{-5}$  rad./sec
18. Average distance between the sun and earth =  $1.5 \times 10^{11}$  m.
19. Average distance between moon and the earth =  $3.84 \times 10^8$  m.
20. Magnetic Moment of the earth =  $6.4 \times 10^{21}$  Amp. X m<sup>2</sup>.

### Conversion Coefficients

1. 1 Light year =  $9.46 \times 10^{15}$  m.
2. 1 A.U. =  $1.496 \times 10^{11}$  m.
3.  $1 \text{ \AA} = 10^{-10}$  m.
4. 1 Pound = 0.4536 kg = 453.6 gm
5. 1 Fermi =  $10^{-15}$  m.
6. 1 C.S.L. = 1.4 x Mass of the sun.
7. 1 Shake =  $10^{-8}$  sec
8. 1 eV =  $1.6 \times 10^{-19}$  Joule.
9. 1 Horse Power = 746 Watt.

## Quadratic Equation

An equation of second degree is called a quadratic equation. It is of the form

:-

$$ax^2 + bx + c = 0$$

The roots of a quadratic equation are

$$X = \frac{-b \pm (b^2 + 4ac)^{1/2}}{2a}$$

## Binomial Theorem

If  $n$  is any integer, positive or negative or a fraction and  $x$  is any real number, then

$$(1+x)^n = 1 + nx + \frac{n(n-1)x^2}{!2} + \dots$$

If  $|x| \ll 1$ , then  $(1+x)^n = 1 + nx$ .

## Mensuration :-

1. Area of a circle =  $\pi r^2 = \pi D^2/4$
2. Surface area of a sphere =  $4\pi r^2 = \pi D^2$
3. Volume of a sphere =  $4/3 \pi r^3$
4. Surface area of a cylinder =  $2\pi r(r+l)$
5. Volume of a cylinder =  $\pi r^2 l$
6. Curved surface area of a cone =  $\pi rl$
7. Volume of a cone =  $1/3\pi r^2 h$
8. Surface area of a cube =  $6x(\text{side})^2$
9. Volume of a cube =  $(\text{side})^3$

## Fundamental Trigonometric relations

$$\text{Cosec}\theta = \frac{1}{\text{Sin}\theta}$$

$$\text{Sec}\theta = \frac{1}{\text{Cos}\theta}$$

$$\text{Cot}\theta = \frac{\text{Cos}\theta}{\text{Sin}\theta} = \frac{1}{\text{Tan}\theta}$$

$$\text{Tan}\theta = \frac{\text{Sin}\theta}{\text{Cos}\theta}$$

$$\text{Sin}^2 \theta + \text{Cos}^2 \theta = 1$$

$$1 + \tan^2 \theta = \text{Sec}^2 \theta$$

$$1 + \text{Cot}^2 \theta = \text{Cosec}^2 \theta$$

$$\text{Sin}(A+B) = \text{Sin}A\text{Cos}B + \text{Cos}A\text{Sin}B$$

$$\cos(A + B) = \cos A \cos B - \sin A \sin B$$

$$\sin(A - B) = \sin A \cos B - \cos A \sin B$$

$$\cos(A - B) = \cos A \cos B + \sin A \sin B$$

$$\tan(A + B) = \frac{\tan A + \tan B}{1 - \tan A \tan B}$$

$$\sin 2A = 2 \sin A \cos A$$

$$\cos 2A = 2 \cos^2 A - 1 = 1 - 2 \sin^2 A = \cos^2 A - \sin^2 A$$

$$\sin(A+B) + \sin(A-B) = 2 \sin A \cos B$$

$$\cos(A+B) + \cos(A-B) = 2 \cos A \cos B$$

$$\cos C + \cos D = 2 \cos \frac{(C+D)}{2} \cos \frac{(C-D)}{2}$$

## Logarithms

$$\log_a mn = \log_a m + \log_a n$$

$$\log_a \left(\frac{m}{n}\right) = \log_a m - \log_a n$$

$$\log_a m = \log_b m \times \log_a b$$

$$\log_{10} 10^3 = \log_{10} 1000 = 3$$

$$\log_a 1 = 0$$

$$\log_a a = 1$$

### Average Values

$$\langle \sin \theta \rangle = 0, \quad \langle \cos \theta \rangle = 0$$

$$\langle \sin^2 \theta \rangle = \frac{1}{2}$$

$$\langle \cos^2 \theta \rangle = \frac{1}{2}$$

### Approximate Values

If angle ( $\theta$ ) small then  $\theta \longrightarrow 0$

$$\sin \theta \cong \theta$$

$$\cos \theta \cong 1$$

$$\tan \theta \cong \theta$$

## Differential Formulae

1. Differentiation of a constant  $c$  is zero

$$\frac{dc}{dx} = 0$$

$$2. \frac{d(cy)}{dx} = c \frac{dy}{dx}$$

$$3. \frac{d(x^n)}{dx} = nx^{n-1}$$

$$4. \frac{d[f(x) \pm g(x)]}{dx} = \frac{df(x)}{dx} \pm \frac{dg(x)}{dx}$$

$$5. \frac{d\{f(x)g(x)\}}{dx} = \frac{f(x)dg(x)}{dx} + \frac{g(x)df(x)}{dx}$$

$$6. \frac{d}{dx} \left\{ \frac{f(x)}{g(x)} \right\} = \frac{g(x) \frac{df(x)}{dx} - f(x) \frac{dg(x)}{dx}}{\{g(x)\}^2}$$

$$7. \frac{dy}{dx} = \frac{dy}{du} \frac{du}{dx}$$

$$8. \frac{de^x}{dx} = e^x$$

$$9. \frac{du^n}{dx} = nu^{n-1} \frac{du}{dx}$$

$$10. \frac{d \log_e x}{dx} = \frac{1}{x}$$

$$11. \frac{d(a^x)}{dx} = a^x \log_e a$$

$$12. \frac{d \log_a x}{dx} = \frac{1}{x} \log_e a$$

$$13. \frac{d(\sin x)}{dx} = \cos x$$

$$14. \frac{d(\cos x)}{dx} = -\sin x$$

$$15. \frac{d(\tan x)}{dx} = \sec^2 x$$

$$16. \frac{d(\cot x)}{dx} = -\operatorname{cosec}^2 x$$

$$17. \frac{d(\operatorname{cosec} x)}{dx} = -\operatorname{cosec} x \cot x$$

$$18. \frac{d(\sec x)}{dx} = \sec x \tan x$$

### Integral Formulae

$$1. \int dx = x + c \quad \text{Where } c = \text{constant}$$

$$2. \int x^{n+1} dx = \frac{x^{n+1}}{n+1} + C$$

$$3. \int dx/x = \log_e x + c$$

$$4. \int \sin x \, dx = -\cos x + c$$



- There are three main uses of the dimensional analysis-
  - (a) To convert a unit of given physical quantities from one system of units to another system for which we use

$$n_2 = n_1 [M_1/M_2]^a [L_1/L_2]^b [T_1/T_2]^c$$

- (b) To check the correctness of a given physical relation.
- (c) To derive a relationship between different physical quantities.

- Significant figures: - The significant figures are normally those digits in a measured quantity which are known reliably plus one additional digit that is uncertain.

For counting of the significant figure rule are as:

- (i) All non- zero digits are significant figure.
  - (ii) All zero between two non-zero digits are significant figure.
  - (iii) All zeros to the right of a non-zero digit but to the left of an understood decimal point are not significant. But such zeros are significant if they come from a measurement.
  - (iv) All zeros to the right of a non-zero digit but to the left of a decimal point are significant.
  - (v) All zeros to the right of a decimal point are significant.
  - (vi) All zeros to the right of a decimal point but to the left of a non-zero digit are not significant. Single zero conventionally placed to the left of the decimal point is not significant.
  - (vii) The number of significant figures does not depend on the system of units.
- In addition or subtraction, the result should be reported to the same number of decimal places as that of the number with minimum number of decimal places.
  - In multiplication or division, the result should be reported to the same number of significant figures as that of the number with minimum of significant figures.
  - Accuracy refers to the closeness of a measurement to the true value of the physical quantity and precision refers to the resolution or the limit to which the quantity is measured.

- Difference between measured value and true value of a quantity represents error of measurement.

It gives an indication of the limits within which the true value may lie.

Mean of n measurements

$$a_{\text{mean}} = \frac{a_1 + a_2 + a_3 + \dots + a_n}{n}$$

Absolute error ( $\Delta a$ ) =  $a_{\text{mean}} - a_i$  Where  $a_i$  = measured value

It may be - positive, negative or zero.

- (i) Mean absolute error
- (ii) Relative error - it is the ratio of the mean absolute error to the true value.

$$\delta a = |\Delta a| / a_{\text{mean}}$$

- (iii) The relative error expressed in percent is called percentage error.

The error is communicated in different mathematical operations as detailed below:

- (i) For  $x = (a \pm b)$ ,  $\Delta x = \pm (\Delta a + \Delta b)$
- (ii) For  $x = a \times b$ ,  $\Delta x/x = \pm (\Delta a/a + \Delta b/b)$
- (iii) For  $x = a/b$ ,  $\Delta x/x = \pm (\Delta a/a + \Delta b/b)$
- (iv) For  $x = a^n b^m / c^p$ ,  $\Delta x/x = \pm (n\Delta a/a + m\Delta b/b + p\Delta c/c)$

### Very short answer type questions, (1 mark question)

Q1. State one law that holds good in all natural processes.

Ans. One such law is the Newton's gravitation law, According to this law everybody in this nature are attracts with other body with a force of attraction which is directly proportional to the product of their masses and inversely proportionally To the square of the distance between them.

Q2: Among which type of elementary particles does the electromagnetic force act?

Ans : Electromagnetic force acts between on all electrically charged particles.

Q3. Name the forces having the longest and shortest range of operation.

Ans : longest range force is gravitational force and nuclear force is shortest range force.

Q4. If 'slap' times speed equals power, what will be the dimensional equation for 'slap'?

Ans . Slap x speed = power

Or slap = power/speed =  $[MLT^{-2}]$

Q5. If the units of force and length each are doubled, then how many times the unit of energy would be affected?

Ans : Energy = Work done = Force x length

So when the units are doubled, then the unit of energy will increase four times.

Q6. Can a quantity has dimensions but still has no units?

Ans : No, a quantity having dimension must have some units of its measurement.

Q7. Justify  $L + L = L$  and  $L - L = L$ .

Ans: When we add or subtract a length from length we get length, So  $L + L = L$  AND  $L - L = L$ , justify.

Q8. Can there be a physical quantity that has no unit and no dimensions?

Ans : yes, like strain.

Q9. Given relative error in the measurement of length is 0.02, what is the percentage error?

Ans: percentage error = 2 %

Q10. If  $g$  is the acceleration due to gravity and  $\lambda$  is wavelength, then which physical quantity does represented by  $\sqrt{g\lambda}$ .

Ans. Speed or velocity.

### **Short answer type questions (2 marks)**

Q1.If heat dissipated in a resistance can be determined from the relation:

$H = I^2Rt$  joule , If the maximum error in the measurement of current, resistance and time are 2% ,1% , and 1% respectively, What would be the maximum error in the dissipated heat?

Ans: % error in heat dissipated is  $\pm 6$  %.

Q2. Name any three physical quantities having the same dimensions and also give their dimensions.

Ans : Any group of physical quantities, like work , energy and torque and their dimensions [  $ML^2 T^{-2}$ ].

Q3. In Van der Wall's equation  $( P + a/V^2)( V - b ) = RT$ , Determine the dimensions of a and b.

Ans :  $[a] = [ML^5 T^{-2}]$  and  $[b] = [ M^0L^3T^0]$ .

Q4. Give the limitations of dimensional analysis.

Ans .....

Q5. If  $X= a+ bt^2$  , where X is in meter and t is in second . find the unit of a and b?

Ans : unit of a is meter and unit of b is  $m/sec^2$ .

Q6. What is meant by significant figures ? State the rules for counting the number of significant figures in a measured quantity?

Ans. ....

Q7. Show that the maximum error in the quotient of two quantities is equal to the sum of their individual relative errors.

Ans : For  $x = a/b$  ,  $\Delta x/x = \pm ( \Delta a/a + \Delta b/b)$

Q8. Deduce the dimensional formulae for the following physical quantities.

A) Gravitational constant.

B) Power

C) coefficient of viscosity

D) Surface tension.

Ans: (A) gravitational constant =  $[M^{-1} L^3 T^{-2}]$ ,

B) Power =  $[ML^2T^{-3}]$

C) Coefficient of viscosity =  $[ ML^{-1} T^{-1}]$

D) Surface tension =  $[ ML^0T^{-2}]$

Q9. Name the four basic forces in nature. Arrange them in the order of their increasing strengths.

Ans : (i) Gravitational force                      (ii) Electromagnetic force  
(iii) nuclear force                                      (iv) Weak force

The relative strengths of these forces are

$$F_g : F_w : F_e : F_s = 1 : 10^{25} : 10^{36} : 10^{38} .$$

Q10. Convert 1 Newton force in to Dyne.

Ans :  $1N = 10^5$  Dyne.

## Short answer type questions (3marks)

Q1. If E, M, J and G respectively denote energy, mass, angular momentum and gravitational constant, Calculate the dimensions of  $EJ^2/M^5G^2$

Q2. The frequency  $\nu$  of vibration of stretched string depends on its length L its mass per unit length m and the tension T in the string obtain dimensionally an expression for frequency  $\nu$ .

Q3. What is meant by significant figures .State the rules for counting the number of significant figures in a measured quantity?

Q4. A physical quantity X is given by  $X = A^2B^3/C\sqrt{D}$  , If the percentage errors of measurement in A,B,C and D are 4%,2%,3% and 1% respectively, then calculate the % error in X.

Q5. If two resistors of resistance  $R_1=(4 \pm 0.5)\Omega$  and  $R_2=(16 \pm 0.5)\Omega$  are connected (1) In series and (2) Parallel . Find the equivalent resistance in each case with limits of % error.

Q6. The length of a rod measured in an experiment was found to be 2.48m, 2.46, 2.50m and 2.48m and 2.49m, Find the average length , the absolute error in each observation and % error.

Q7. A famous relation in physics relates moving mass m to the rest mass  $m_0$  of a particle in terms of its speed v and the speed of the light c. A boy recalls the relation almost correctly but forgets where to put the constant c. He writes:

$$m = m_0 / (1 - v^2)^{1/2}$$

Guess where to put the missing c.

Q8. A calorie is a unit of heat energy and it equals about 4.2 J, where  $1 \text{ J} = 4.2 \text{ kgm}^2\text{s}^{-2}$ . Suppose we employ a system of units in which the unit of mass equals  $\alpha$  kg, the unit of length equals  $\beta$  m, the units of time is Y sec. show that a calorie has a magnitude  $4.2 \alpha^{-1} \beta^{-2} Y^2$  in terms of the new units.

Q9. In the formula  $X = 3YZ^2$ , X and Z have dimensions of capacitance and magnetic induction respectively, what are the dimensions of Y in MKS system?

Q10. In an experiment, on the measurement of g using a simple pendulum the time period was measured with an accuracy of 0.2 % while the length was measured with accuracy of 0.5%. Calculate the percentage error in the value of g.

## Long answer question ( 5 marks )

Q1. Explain:

- (i) Absolute error
- (ii) Relative error
- (v) Random error
- (iii) Mean absolute error
- (iv) percentage error

Q2. Convert:

( i ) Gravitational constant (G) =  $6.67 \times 10^{-11} \text{ Nm}^2 \text{ kg}^{-2}$  to  $\text{cm}^3 \text{ g}^{-1} \text{ s}^{-2}$  (ii) The escape velocity  $v$  of a body depends on, the acceleration due to gravity 'g' of the planet and the radius R of the planet, Establish dimensionally for relation for the escape velocity.

Q3. Name the four basic forces in nature. Write a brief note of each, hence compare their strengths and ranges.

### HOTS

Q1. What are the dimensions of  $1/\mu_0 \epsilon_0$ , where symbols have their usual meaning.

Ans :  $[ \text{M}^0 \text{L}^2 \text{T}^{-2} ]$

Q2. What is the dimensions of  $(1/2) \epsilon_0 E^2$  , Where E electric field and  $\epsilon_0$  permittivity of free space.

Ans :  $[ \text{M}^1 \text{L}^{-1} \text{T}^{-2} ]$

Q3. The pairs of physical quantities that have the same dimensions are:

- (a) Reynolds's number and coefficient of friction,
- (b) Curie and frequency of a light wave
- (c) Latent heat and gravitational potential
- (d) Planck's constant and torque.

Ans : (a), (b).

Q4. If L,C,R represent inductance , capacitance and resistance respectively, the combinations having dimensions of frequency are

- (a)  $1/\sqrt{CL}$
- (b) L/C
- (c) R/L
- (d) R/C

Ans : (a) and (c).

Q5. If the error in radius is 3%, what is error in volume of sphere?

- (a) 3 %
- (b) 27 %
- (c) 9 %
- (d) 6 %

Ans : ( c ) 9%.

## KINEMATICS

\*rest and Motion are relative terms, nobody can exist in a state of absolute rest or of absolute motion.

\*One dimensional motion:- The motion of an object is said to be one dimensional motion if only one out of three coordinates specifying the position of the object change with time. In such a motion an object move along a straight line path.

\*Two dimensional motion:- The motion of an object is said to be two dimensional motion if two out of three coordinates specifying the position of the object change with time. In such motion the object moves in a plane.

\*Three dimensional motion:- The motion is said to be three dimensional motion if all the three coordinates specifying the position of an object change with respect to time ,in such a motion an object moves in space.

\*The magnitude of displacement is less than or equal to the actual distance travelled by the object in the given time interval.

$$\text{Displacement} \leq \text{Actual distance}$$

\*Speed:- It is rate of change of distance covered by the body with respect to time.

$$\text{Speed} = \text{Distance travelled} / \text{time taken}$$

Speed is a scalar quantity .Its unit is meter /sec. and dimensional formula is  $[M^0L^1T^{-1}]$  .It is positive or zero but never negative.

\*Uniform Speed:- If an object covers equal distances in equal intervals of time than the speed of the moving object is called uniform speed. In this type of motion, position – time graph is always a straight line.

\*Instantaneous speed:-The speed of an object at any particular instant of time is called instantaneous speed. In this measurement, the time  $\Delta t \rightarrow 0$ .

When a body is moving with uniform speed its instantaneous speed = Average speed = uniform speed.

\*Velocity:- The rate of change of position of an object in a particular direction with respect to time is called velocity. It is equal to the displacement covered by an object per unit time.

$$\text{Velocity} = \text{Displacement} / \text{Time}$$

Velocity is a vector quantity, its SI unit is meter per sec. Its dimensional formula is  $[M^0L^1T^{-1}]$ . It may be negative, positive or zero.

\*When a body moves in a straight line then the average speed and average velocity are equal.

\*Acceleration:- The rate of change of velocity of an object with respect to time is called its acceleration.

### **Acceleration = Change in velocity /time taken**

It is a vector quantity, Its SI unit is meter/ sec.<sup>2</sup> and dimension is  $[M^0L^1T^{-2}]$ , It may be positive ,negative or zero.

\*Positive Acceleration:- If the velocity of an object increases with time, its acceleration is positive .

\*Negative Acceleration :-If the velocity of an object decreases with time, its acceleration is negative . The negative acceleration is also called retardation or deacceleration.

\*Formulas of uniformly accelerated motion along straight line:-

For accelerated motion,

$$V = u + at$$

$$S = ut + \frac{1}{2} at^2$$

$$V^2 = u^2 + 2as$$

$$S_n = u + \frac{a}{2}(2n - 1)$$

For deceleration motion

$$v = u - at$$

$$S = ut - \frac{1}{2} at^2$$

$$V^2 = u^2 - 2as$$

$$S_n = u - \frac{a}{2}(2n - 1)$$

\*Free fall :- In the absence of the air resistance all bodies fall with the same acceleration towards earth from a small height. This is called free fall. The acceleration with which a body falls is called gravitational acceleration (g).Its value is  $9.8 \text{ m/sec}^2$ .

\*Relative Motion:- The rate of change of distance of one object with respect to the other is called relative velocity. The relative velocity of an object B with respect to the object A when both are in motion is the rate of change of position of object B with respect to the object A.

\*Relative velocity of object A with respect to object B

$$\vec{V}_{AB} = \vec{V}_A - \vec{V}_B$$

When both objects are move in same direction, then the relative velocity of object B with respect to the object A

$$\vec{V}_{BA} = \vec{V}_B - \vec{V}_A$$

When the object B moves in opposite direction of object A .

$$\vec{V}_{BA} = \vec{V}_B + \vec{V}_A$$

When  $V_A$  and  $V_B$  are incident to each other at angle  $\Theta$

$$V_{AB} = (V_A^2 + V_B^2 - 2V_A V_B \cos \Theta)^{1/2}$$

\*Scalars :- The quantities which have magnitude only but no direction. For example : mass, length, time, speed , temperature etc.

\*Vectors :- The quantities which have magnitude as well as direction and obeys vector laws of addition, multiplication etc.

For examples : Displacement, velocity, acceleration, force , momentum etc.

## **PHYSICS:**

### **SECTION 1**

- Q.1. What is the dimensional formula of gravitational constant?  
Q.2. Write down the limitations of dimensional analysis.  
Q.3. Which of the following is the most precise device for measuring length :-  
(a) a vernier callipers with 20 divisions on sliding scale. (b) a screw gauge of pitch 1 mm & 100 divisions on circular scale. (c) an optical instrument that can measure length to within a wavelength of light ?  
Q.4. Subtract 0.2 kg from 34 kg with due regard to significant figures.  
Q.5. Name some physical quantities that have same dimension.  
Q.6. Name the physical quantities that have dimensional formula  $[ML^{-1}T^{-2}]$   
Q.7. Give two examples of dimension less variables.  
Q.8. Given relative error in the measurement of length is .02, what is the percentage error?

### **SECTION 2**

- Q.1. Differentiate between fundamental and derived units. Give examples also.  
Q.2. Ultrasonic sent by a SONAR return back to it after reflection from a rock under water after a time lapse of 2.2 second. If the velocity of ultrasonic in water is 1450 m/s, find the depth below the water surface.  
Q.3. The length of a rod as measured in an experiment was found to be 2.48m, 2.46m, 2.49m, 2.50m and 2.48m. Find the average length, absolute error and percentage error. Express the result with error limit.  
Q.4. Write the dimensions of a and b in the relation:  $E = \frac{b-x^2}{at}$  Where E, x & t represent energy, distance & time respectively.  
Q.5. Write the dimensions of a/b in the relation  $F = ax + bt^2$  Where F is force, x is distance and t is time.  
Q.6. Check the corrections of the relation.  $P = h d g$  Where the letters have their usual meaning.  
Q.7. Wavelength  $\lambda$  associated with a moving particle depends upon its mass m, its velocity v and Planck's constant h. Find dimensionally the relation between these quantities.  
Q.8. Derive by the method of dimensions, an expression for the energy of a body executing S.H.M., assuming that this energy depends upon; the mass (m), the frequency (v) and the amplitude of vibration (r).  
Q.9. Consider a simple pendulum. The period of oscillation of simple pendulum depends on its length and acceleration due to gravity. Derive the expression for its time period.  
Q.10. What is meant by significant figures? How are these counted?  
Q.11. Define the terms (i) mean absolute error. (ii) Relative error and (iii) percentage error. How are they calculated?  
Q.12. A physical quantity P is related to four observables a, b, c and d as follows:-  $P = \frac{a^2 b^3}{cd}$  The percentage errors of measurement in a, b, c and d are 1%, 3%, 4% and 2% resp. What is the percentage error in measurement of P?  
Q.13. State the number of significant figures in  
(i) 0.007 (ii)  $2.64 \times 10^{24}$  kg (iii) 0.2370 g (iv) 0.2300m (v) 86400 m  
Q.14. Using dimensions convert (a) 1 newton into dynes (b) 1 erg into joules.  
Q.15. Magnitude of force experienced by an object moving with speed v is given by  $F = kv^2$ . Find dimensions of k.  
Q.16. The sides of a rectangle are  $(10.5 \pm 0.2)$  cm and  $(5.2 \pm 0.1)$  cm. Calculate its perimeter with error limits.  
Q.17. The mass of a box measured by a grocer's balance is 2.3 kg. Two gold pieces 20.15 g and 20.17 g are added to the box. (i) What is the total mass of the box? (ii) The difference in masses of the pieces to correct significant figures.  
Q.18. 5.74 g of a substance occupies 1.2 cm<sup>3</sup>. Express its density to correct significant figures.  
Q.19. If displacement of a body  $s = (200 \pm 5)$  m and time taken by it  $t = (20 \pm 0.2)$  s, then find the percentage error in the calculation of velocity.  
Q.20. If the error in measurement of mass of a body be 3% and in the measurement of velocity be 2%. What will be maximum possible error in calculation of kinetic energy.

## Class XI Psychology

### Holiday Homework (2026–27)

#### 1. Psychology Project

##### Topic: Understanding Stress in Daily Life

Prepare a psychology project using the Interview Method. Students will conduct an interview with one participant belonging to the age group of 18–40 years to understand how people experience and manage stress in their daily life.

The project will include:

- \* Introduction
- \* Aim/Objectives
- \* Research Question
- \* Methodology
- \* Interview Questions
- \* Findings/Results
- \* Conclusion
- \* Bibliography

Note: The detailed format for the project file will be shared separately.

#### 2. Assignment Work

Complete the assignment questions from the Assignment Booklet of:

- \* Chapter 1- What Is Psychology?
- \* Chapter 2 - Methods Of Enquiry in Psychology

Components to be completed:

- \* Learning Checks
- \* Case-Based Questions

Note: All work should be neat, well-organised, and original.