PRAYAG PUBLIC SCHOOL

Summer Vacation Holiday Homework (2026–27)

Class-11th

Subject: Political Science

General Instructions:

:- Complete all work in a separate holiday homework notebook/project file.

:- Maintain neat handwriting and proper presentation.

:- Use examples, newspaper cuttings, charts, and constitutional references wherever required.

:- Revise all chapters thoroughly for examinations.

:- Submit the homework on the first working day after summer vacation.

Chapter 1: Political Theory – An Introduction

Answer the following questions

1. What is Political Theory?
2. Define politics.
3. Why do we need political theory?
4. What is the significance of equality in politics?
5. Name any two political thinkers
6. Explain the meaning and scope of political theory.
7. Why is political theory relevant in modern society?
8. Distinguish between politics and political theory.
9. Discuss the importance of justice and equality.
10. Analyze the role of political theory in understanding society.
11. Explain how political theory helps in solving social and political issues.

B. Activity:

:- Prepare a chart on major political thinkers and their contributions.

C. Project Work:

:- Write a report on the importance of political theory in democracy.

Chapter 2: Freedom

Answer the following questions

1. What is freedom?
2. Define liberty.
3. What is negative freedom?
4. What is positive freedom?
5. Name one freedom fighter associated with liberty.
6. Explain the concept of freedom.
7. Distinguish between positive and negative liberty.
8. Why are reasonable restrictions necessary
9. Discuss the relationship between freedom and equality.
10. Evaluate different dimensions of freedom.
11. Explain why freedom is essential in a democratic society.

B. Activity:

:- Collect examples from daily life where freedom is exercised responsibly.

C. Project Work:

:- Prepare an essay on “Freedom and Responsibility in Modern Democracy.”

Chapter 3: Constitution – Why and How?

1. What is a Constitution?
2. When was the Indian Constitution adopted?
3. Who was the Chairman of the Drafting Committee?
4. What is the Preamble?
5. Define constitutional supremacy.
6. Why do we need a Constitution?
7. Explain the making of the Indian Constitution.
8. Discuss the role of the Constituent Assembly.
9. Explain the importance of the Preamble
10. Analyze the significance of the Constitution in a democracy.
11. Discuss the major features of the Indian Constitution.

B. Activity:

:- Write and decorate the Preamble of the Indian Constitution.

C. Project Work:

:- Prepare a timeline of the making of the Indian Constitution.

Chapter 4: Rights in the Indian Constitution

1. What are Fundamental Rights?
2. How many Fundamental Rights are there?
3. What is the Right to Equality?
4. What is the Right to Freedom?
5. Define Constitutional Remedies.
6. Explain the importance of Fundamental Rights.
7. Describe the six Fundamental Rights
8. What is the significance of the Right to Constitutional Remedies?
9. Explain Directive Principles and their relevance.
10. Evaluate the role of Fundamental Rights in protecting democracy.
11. Explain how rights and duties are interconnected.

B. Activity:

:- Prepare a chart showing all Fundamental Rights with examples.

C. Project Work:

Make a case study of any one landmark Supreme Court judgment related to Fundamental Rights.

Creative Assignment Section:

:- Students must complete any two:

:- Poster on Fundamental Rights and Duties

:- Essay on Democracy and Freedom

:- Scrapbook on Constitution Makers of India

:- Presentation on Political Thinkers and Their Ideas

Teacher's Note:

This holiday homework is designed to develop political awareness, constitutional understanding, and critical thinking among students. Students should use newspapers, NCERT books, and reference materials for additional knowledge

Mathematics

Topic 1: Basic Mathematics (Non Negative Quantities, Modulus, Square Root Expressions, Even Power Expressions, Operations of Numbers)

1. Solve and represent the solution set on number line: $|2x - 5| \leq 7$.
2. Solve the inequality $|x - 3| + |x + 1| < 8$.
3. Find all real values of x satisfying $\sqrt{(2x - 1)} + \sqrt{(x - 2)} = 3$.
4. Solve: $\sqrt{(x + 5)} + \sqrt{(9 - x)} = 5$.
5. Find the domain of the function $f(x) = \sqrt{(x^2 - 5x + 6)}$.
6. Find the domain of $f(x) = 1/\sqrt{(x^2 - 9)}$.
7. Solve the equation $x^2 - 6x + 5 \geq 0$.
8. Find the values of x for which $x^4 - 16 \leq 0$.
9. Solve the inequality $(x - 2)^2(x + 3)^2 \geq 0$ and explain the result.
10. Simplify and evaluate: $|3 - 5| + |-7 + 2| - |-4|$.
11. Prove that $|a + b| \leq |a| + |b|$ for all real numbers a and b.
12. Find the value of x if $|2x - 1| = 7$.
13. Solve: $\sqrt{(x + 4)} = x - 2$.
14. Determine whether $\sqrt{(x^2 - 4x + 4)}$ is defined for all real x.
15. Find the least value of the expression $x^2 + 4x + 7$.
16. If a, b are real numbers, prove that $a^2 + b^2 \geq 2ab$.
17. Solve the equation $|x^2 - 9| = 5$.
18. Find all real solutions of $\sqrt{(2x + 3)} = \sqrt{(x + 6)} - 1$.
19. Explain with examples why even power expressions are always non $-$ negative.
20. Discuss the properties and applications of modulus function in real life situations.

Topic 2: Sets

1. Let $A = \{1,2,3,4,5\}$ and $B = \{2,4,6,8\}$. Find $A \cup B$, $A \cap B$ and $A - B$.
2. If $U = \{1,2,3,4,5,6,7,8,9,10\}$, $A = \{2,4,6,8,10\}$ and $B = \{1,2,3,4,5\}$, find A', B' and $(A \cup B)'$.
3. Verify De Morgan's laws for the sets $A = \{1,2,3\}$, $B = \{3,4,5\}$ and universal set $U = \{1,2,3,4,5,6\}$.
4. Prove that $A \cap (B \cup C) = (A \cap B) \cup (A \cap C)$.
5. Prove that $A \cup (B \cap C) = (A \cup B) \cap (A \cup C)$.
6. In a class of 60 students, 35 like Mathematics, 25 like Physics and 10 like both. Find how many students like n
7. In a survey of 100 students, 60 like Cricket, 45 like Football and 25 like both. Find how many like only Cricket
8. If $n(A) = 20, n(B) = 15$ and $n(A \cap B) = 5$, find $n(A \cup B)$.
9. Find the power set of $A = \{1,2,3\}$.
10. Find the number of subsets of the set $A = \{a, b, c, d, e\}$.

11. $Show\ that\ A - (B \cup C) = (A - B) \cap (A - C)$.
12. $Show\ that\ (A - B) \cup (A \cap B) = A$.
13. $If\ A = \{x: x\ is\ a\ prime\ number\ less\ than\ 15\}\ and\ B = \{x: x\ is\ an\ odd\ number\ less\ than\ 15\}, find\ A \cap B$.
14. $State\ and\ prove\ the\ associative\ laws\ of\ sets$.
15. $State\ and\ prove\ the\ commutative\ laws\ of\ sets$.
16. $Find\ the\ Cartesian\ product\ A \times B\ where\ A = \{1,2,3\}\ and\ B = \{a, b\}$.
17. $How\ many\ relations\ can\ be\ defined\ from\ a\ set\ having\ 4\ elements\ to\ itself$?
18. $In\ a\ group\ of\ 80\ people, 50\ like\ tea, 40\ like\ coffee\ and\ 20\ like\ both.\ Find\ how\ many\ like\ neither\ tea\ nor\ coffe$
19. $Explain\ the\ difference\ between\ finite\ and\ infinite\ sets\ with\ examples$.
20. $Write\ detailed\ notes\ on\ universal\ set, empty\ set\ and\ singleton\ set\ with\ suitable\ examples$.

English Core

1.How did the grandmother spend her day before her death?
2. What was the turning point in the friendship between grandmother and grandson?
3. Describe 'the happiest half-hour of the day' for the grandmother?
4. What are the differences between the village school education and the urban school education as mentioned in the chapter?
5. Do you think that the writer's attitude towards his grandmother changes as he grows up?
6. What does the behaviour of the sparrows assure about 'man and animal' love relationship?
7. What does the poem suggest about the passage of time?
8. How does the poet's nostalgia for childhood manifest in the poem?
9. How does the poet's tone convey his emotions about his childhood?
10. How did the grandmother spend her day before her death?
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You are Vikram /Sonia, a renowned dance coach based in Delhi. Your finesse in various dance forms is well-acclaimed. You are looking for part time/ full time job. Write an advertisement in about 50 words for the 'Situations Wanted' column of a local newspaper. Your contact no. 9997512XX.
16. You own an independent house in Jacobpura West in North Delhi, and you want to sell it. Draft an advertisement for a local daily, giving all necessary details in 50 words.
17. You have shifted to Delhi. You want to buy a 3 BHK flat near your office in Shalimar Bagh. Draft an advertisement in 50 words.
18. Rearrange the following words/phrases into meaningful sentences.
1. had / left / we / before / the place / it / started / raining
2. hardly / she / when / the phone / started / speaking / rang
3. known / the truth / had / we / earlier / acted / differently / we / would have
4. lost / the key / he / not / been / had / locked out / he / would have
5. unless / you / submit / on time / assignment / your / marks / be / deducted / will
6. dream / to / a / reality / turned / his / hard work / has
7. the offer / regret / later / might / refusing / you
8. watched / the movie / a / we / twice / already / have
9. so / she / shocked / was / speak / she / could / not

Business Studies

SECTION A – CASE STUDY BASED QUESTIONS

Q1.A group of young entrepreneurs started an organic food business with the objective of earning profit as well as promoting healthy eating habits. Initially, the business faced losses due to lack of market awareness, but gradually demand increased because of changing consumer preferences.
(a) Identify any two characteristics of business highlighted above. (b) Explain the economic and social objectives of business.
(c) Why is risk considered an essential element of business activity?
Q2."Bright Future Coaching Centre" was started by two friends who contributed equal capital and agreed to share profits equally. After a few years, one partner took an important business decision without consulting the other, causing disputes.
(a) Identify the form of business organization. (b) Explain any three features of this form of organization.
(c) Suggest two measures to avoid conflicts among partners.

Q3.The Government of India established a company to improve railway transportation and infrastructure. Although it works under government ownership, it has operational flexibility similar to private companies.

(a) Identify the type of public enterprise discussed above. (b) Explain any three features of this enterprise.
(c) State two advantages of this form of organization.
Q4.A multinational electronics company established manufacturing units in different countries and sold products worldwide. Due to large-scale operations, the company gained high profits but faced criticism for exploiting local resources.
(a) Identify the type of enterprise involved. (b) Explain any three features of multinational companies.
(c) Mention any two criticisms of multinational corporations.
Q5.A small business owner sold defective electrical products to customers without proper quality testing. As a result, many customers complained and the business reputation declined rapidly.
(a) Which social responsibility of business was ignored here? (b) Explain the concept of business ethics.
(c) Why is customer satisfaction important for long-term survival of a business?

SECTION B – APPLICATION & COMPETENCY QUESTIONS

Q6.Differentiate between Profession and Employment on the basis of any four points.
Q7.Explain the objectives of business in detail.
Q8.Describe any four causes of business risks with suitable examples.
Q9.Explain the merits and limitations of Sole Proprietorship.
Q10.Why is partnership considered suitable for medium-sized businesses? Explain.
Q11.Differentiate between Joint Hindu Family Business and Partnership.
Q12.Explain the features of a Cooperative Society.
Q13.Discuss the merits and limitations of a Company form of business organization.
Q14.What are Departmental Undertakings? Explain their advantages and limitations.
Q15.Explain the role of Public Sector enterprises in economic development.
SECTION C – HIGHER ORDER THINKING QUESTIONS (HOTS)
Q16.“Profit earning cannot be the sole objective of business.” Do you agree? Justify your answer with suitable examples.
Q17.A business organization earns huge profits but pollutes nearby rivers and harms public health. Can such a business be considered successful? Explain logically.
Q18.Why do multinational corporations prefer developing countries for expansion? Analyze with examples.
Q19.“Business risks can be reduced but cannot be eliminated.” Explain the statement with suitable examples.
Q20.How can cooperative societies help in reducing exploitation of consumers and small producers?
SECTION D – CBSE CASE STUDIES
Q21.“Fresh Basket Pvt. Ltd.” started as a small grocery store but later expanded into online delivery services across several cities. The company raised huge capital from investors and appointed professional managers for administration.
(a) Identify the form of business organization. (b) Explain any three features of this form.
(c) Why is this form suitable for large-scale businesses?
Q22.A state government started a transport corporation to provide affordable bus services in rural areas where private operators were unwilling to work.
(a) Identify the type of public enterprise. (b) Explain any three objectives of public sector enterprises.
(c) Why are public enterprises important for rural development?
Q23.A consumer purchased packaged food from a reputed company. Later, it was found that the product contained harmful ingredients and misleading information on packaging. (a) Which ethical values were violated by the company?
(b) Explain the importance of business ethics.
(c) Suggest any two measures businesses should adopt to protect consumer interests.
Q24.Three engineers planned to establish a startup manufacturing solar panels. They wanted limited liability, separate legal identity, and large-scale capital for future expansion.
(a) Which form of business organization would be most suitable? (b) Explain the reasons for your answer.
(c) Mention any two limitations of this form.
Q25.Read the following statement carefully:
“Business plays an important role not only in generating profits but also in improving the standard of living, creating employment, and contributing to national development.”
On the basis of the above statement:
(a) Explain any two economic objectives of business. (b) How does business contribute to society?
(c) Explain the importance of ethical behavior in modern business organizations.
ACTIVITY TASK (COMPULSORY)
Prepare a Project File (40-50 pages) on any one topic:
Which is prescribed in the syllabus of class 11th by cbse
Project Must Include:
Cover Page
Index

Introduction
Main Content
Diagrams/Pictures
Real-life Examples
Conclusion, Bibliography

ECONOMICS

General Instructions:
I. Submit the work on the given date. II. Refer to NCERT or Reference book.
III. Assignment to be done in register in legible writing.
1. Revise all the chapters which have been covered in the class. 2. ASSIGNMENT-
Q1. Complete the following observations;
1- Statistics means ……. 2- Statistics and Economics are …….
3- The term population refers to …….
Q2- Prepare a list of statistical information that you will facilitate comparison of academic performance of your school with others in your neighborhood.
Q3- Write two such pairs of statistical variables that show cause and effect relationship with each other.
Q4- Following statement are true or false:
1- Statistics can only deal with quantitative data. 2- Statistics solve economic problems.
3- Statistics is of no use to economics without data.
Q5- Make a list of activities in a bus stand or a market place. How many of them are economic activities?
Q6- "The government and the policy makers use statistical data to formulate suitable policies of economic development ". Illustrate with two examples.
Q7- State whether the following statements are true or false:
1- There are many sources of data. 2- Data collected by the investigator is called the secondary data.
Q8- Frame three "two way "questions relating to a questionnaire that you intend to design for collecting primary data on the level and composition of expenditure of the people in your locality. (TWO WAY means Yes/NO).
Q9- Frame three "multiple choice "questions relating to a questionnaire that you intend to design for collecting primary data on the level and composition of expenditure of the people in your locality.
Q10- Define Investigator, Enumerator and Respondent.

Accountancy

What is the full form of GAAP?
a) General Accounting Approved Principles b) Generally Accepted Accounting Principles
c) General Accepted Audit Practices d) Government Approved Accounting Policies
2. GAAP is mainly used for:
a) Cooking b) Accounting and financial reporting
c) Sports d) Marketing
3. Which principle states that business and owner are separate entities?
a) Cost Principle b) Business Entity Principle
c) Matching Principle d) Conservatism Principle
4. Which principle assumes business will continue for a long time?
a) Going Concern Principle b) Revenue Principle
c) Dual Aspect Principle d) Objectivity Principle
5. According to the Money Measurement Principle, only transactions measurable in _____ are recorded.
a) Time b) Money c) Quantity d) Weight
6. The Cost Principle states that assets are recorded at:
a) Market Value b) Historical Cost c) Selling Price d) Discounted Price
7. Which principle requires consistency in accounting methods?
a) Consistency Principle b) Matching Principle c) Revenue Principle d) Materiality Principle
8. Revenue is recognized when it is:
a) Earned b) Received c) Deposited d) Invested
9. The Matching Principle matches:
a) Assets with liabilities b) Revenue with expenses c) Cash with profit d) Sales with stock

10. Which principle says accountants should be cautious while recording uncertain events?
a) Conservatism Principle b) Cost Principle c) Going Concern Principle d) Entity Principle
11. GAAP helps in:
a) Uniformity in accounting b) Increasing taxes c) Reducing business size d) Increasing expenses

12. Which principle supports objective evidence for transactions?
a) Objectivity Principle b) Matching Principle
c) Consistency Principle d) Conservatism Principle
13. Which principle requires disclosure of all important information?
a) Full Disclosure Principle b) Cost Principle c) Revenue Principle d) Money Measurement Principle
14. Materiality Principle means:
a) Recording every small detail b) Recording only important information
c) Ignoring all expenses d) Recording estimates only
15. Accounting period concept divides business life into:
a) Months and years b) Profit and loss c) Assets and liabilities d) Sales and purchases
16. Dual Aspect Concept means every transaction has:
a) One effect b) Two effects c) No effect d) Three effects
17. GAAP ensures financial statements are:
a) Comparable b) Colourful c) Short d) Complicated
18. Which principle is related to stable monetary unit?
a) Money Measurement Principle b) Matching Principle
c) Conservatism Principle d) Revenue Principle
19. Example of Business Entity Concept is:
a) Owner's personal expenses treated separately b) Recording all family expenses
c) Mixing owner and business cash d) Ignoring owner drawings
1.Define accounting. Explain its meaning, objectives, and importance in business.
2. Discuss the main functions of accounting. How does accounting help in decision-making?
3. Explain the objectives of accounting in detail.
4. What are the advantages and limitations of accounting? Explain with examples.
5. Describe the users of accounting information. How is accounting useful to different users?
6. Explain the difference between bookkeeping and accounting.
7. Discuss the role of accounting in modern business organizations.
8. What is the accounting process? Explain its different stages in detail.
9. Explain the qualitative characteristics of accounting information. Why are they important?
10. Why is accounting called the 'language of business'? Explain with suitable examples.

विषय – हिंदी

1 'कबीर दास' के पद का भावार्थ लिखिए और याद कीजिए।
2 'कबीर दास के पद' से संबंधित सभी प्रश्नों को याद कीजिए और लिखिए।
3 'मीरा के पद' का भावार्थ लिखिए और याद कीजिए।
4 'मीरा के पद पाठ' से संबंधित सभी प्रश्नों को याद कीजिए और लिखिए।
5 'नमक का दारोगा' पाठ का सारांश लिखिए।
6 'नमक का दरोगा' पाठ से संबंधित प्रश्नों को याद कीजिए और लिखिए।
7 'मियां नसीरुद्दीन' पाठ का सारांश लिखिए।
8 'मियां नसीरुद्दीन' पाठ से संबंधित प्रश्नों को याद कीजिए और लिखिए।
9 जनसंचार और मध्यम विषय पर एक प्रोजेक्ट फाइल तैयार कीजिए।
10 अपने गांव के शिक्षा से वंचित बच्चों को शिक्षित करने के लिए आप क्या कर सकते हैं ? अपने विचारों को लगभग 150 शब्दों में लिखिए।

History

Practice sheet -1
'Writing and City Life '

1) What do you know about Uruk?
2) Why Mesopotamia is considered important by Europeans? Give reasons.

3) What is the contribution of the Mesopotamian civilization to world?
4) What were the three unique characteristics of town planning of Mesopotamia?
5) Why must there be a social organisation in urban economy?
6) What do you know about the ancient town Ur of Mesopotamia?
7) “There was a great disparity among the different sections of the Mesopotamian society”. Explain.
8) Write a note on imports and exports of Mesopotamia.
9) What is the role of efficient transport in urban economy? Give example of Mesopotamia.
10) What do you know about the Mesopotamian writing system?
11) Why do we say that it was not natural fertility and high levels of food production that were the cause of early urbanisation?
12) What do you know about the following in Mesopotamia?
A) Position of upper class B) Nature of the family C) Marriage system.
13) Illustrate the construction of temple and gradual increasing of activities of temples in Mesopotamia
14) How did kingship emerge in Mesopotamia? What did the king do to increase his influence and control?
15) Describe the main features of the city of Babylon.
16) How did the earliest cities of southern Mesopotamia emerge? Throw light on the construction and increasing importance of the temples built in those cities.
17) Give main geographical features of Mesopotamia
18) State the points of similarities and differences between Indus valley and Mesopotamian civilization
19) What do you know about the Palace at Mari of King Zimrilim? Why it was so famous?
20) Give an estimate of the Sumerian Civilisation of Mesopotamia.

Practice sheet -2

'An Empire across three continents '

1) What was 'Papyrus'? 2) Name the river that formed the northern boundary of the Roman Empire.
3) What was the 'Colosseum'? 4) What was the 'Denarius'?
5) Name the two most important languages used for administration in the Roman Empire.
6) What was the 'Principate'? 7) Which sea is considered the heart of the Roman Empire?
8) Name the three continents across which the Roman Empire was spread.
9) Who was the first Roman Emperor? 10) Explain the condition of women in Roman empire.

Project work:-

SUGGESTIVE TOPICS FOR PROJECTS -

1. Facets of the Industrialization in sixteenth- eighteenth centuries.
2. Crusades: causes; rationale; events; outcomes; Holy Alliance
3. Ancient History in depth: Mesopotamia 4. Greek Philosophy and City States
5. Contributions of Roman Civilization 6. The spirit of Renaissance: Manifestation in art; Literature; Sculpture; Influence on Trading
Community; Social Fabric; Philosophy; Political Values; Rational Thinking; Existentialism
7. Aspects of Development -South American States /Central American States
8. Different schools of thoughts- Realism: Humanism: Romanticism
9. Piecing together the past of Genghis Khan
10. Myriad Realms of Slavery in ancient, medieval, and modern world
11. History of Aborigines – America /Australia
12. Facets of Modernization – China /Japan/Korea

Steps involved in the conduct of the project: Students may work upon the following lines as suggested:-

1. Choose a Title/Topic 2. Need of the Study, Objective of the Study
3. Hypothesis 4. Content -Timeline, Maps, Mind maps, Pictures, etc. (Organization of Material/Data Present
Material/Data)
5. Analysing the Material/Data for Conclusion 6. Draw the Relevant Conclusion
7. Bibliography

Questions

1. Define Physical Education. Write the meaning and importance of physical education in 80–100 words.
2. Explain the following career options: Sports Teacher, Coach, Sports Journalist, Physiotherapist, Yoga Instructor.
3. Differentiate between Physical Education and Sports (minimum 4 points).
4. Write short notes on: Khelo India Programme, Fit India Movement, Olympic Values Education.
5. What is wellness? Define fitness. What is the role of physical education in personality development?
6. Write the history of the Olympic Games (Ancient and Modern Olympics).
7. Explain the Olympic Symbols: Olympic Flag, Olympic Motto, Olympic Anthem, Olympic Torch.
8. Write short notes on: Paralympics, Special Olympics, Deaflympics.
9. Who is the founder of the Modern Olympic Games? What are Olympic values? Name any five Olympic sports.

Situation Based Questions

1. Rahul wants to become a sports commentator after completing his studies. Which career option in physical education is suitable for him and why?
2. A school is organizing a fitness awareness campaign. How can physical education help students maintain a healthy lifestyle?
3. Riya participates in sports daily and has become more disciplined and confident. Which values of physical education are reflected here?
4. Your friend wants to work with injured athletes and help them recover. Which career should you suggest to him/her?
5. During an Olympic event, athletes from different countries compete with honesty and respect. Which Olympic values are shown here?
6. A student with hearing impairment participates in an international sports competition. Which type of Olympic event is suitable for such athletes?
7. The Olympic torch relay is organized before the Games begin. What is the significance of the Olympic torch?
8. An athlete helps another injured athlete during a race instead of focusing only on winning. Which Olympic value is demonstrated?

Practical Activity

1. Make a File/Project on any one topic: Olympic Games History, Indian Olympic Medal Winners, Women Achievers in Sports, Importance of Yoga and Fitness.

Viva Questions

1. What is the Olympic motto?
2. Who started the Modern Olympics?
3. What is physical fitness?
4. Name any two careers in sports.
5. What is the importance of sports in education?

IT

AI for Everyone

1. What is Artificial Intelligence (AI)? What is not AI?
2. How is machine learning related to AI?
3. Define Data. List the types of data.
4. Define machine learning.
5. What is deep learning, and how does it differ from traditional machine learning?
6. What do you mean by Reinforcement Learning? Write any two applications of Reinforcement Learning at School.
7. How do you understand whether a machine/application is AI based or not? Explain with the help of an example.

Case-study/Application Oriented Questions:

1. A hospital implemented an AI system to assist doctors in diagnosing diseases based on medical images such as X-rays and MRI scans. However, some patients expressed concerns about the accuracy and reliability of the AI diagnoses. How can the hospital address these concerns?

Unlocking Your Future in AI

1. Write short notes on the followings:
   I. Opportunities in AI across various industries
   II. Common job roles in AI
   III. Natural Language Processing (NLP)
   IV. Computer Vision
   V. Statistical data
2. Write about Essential skills and tools for prospective AI careers.

Biology

Multiple Choice Questions:

Q1. Fungi usually store the reserved food in the form of:
a) StarchGlycogen and Oil
b) Lipid
c) Protein
Q2. In prokaryotes, the genetic material is:
a) Circular DNA without histones
b) Linear DNA without histones
c) Circular DNA with histones
d) Linear DNA with histones
Q3. The term 'superparasite' means:
a) Mycoplasma
b) Animal Parasites
c) viruses
d) A parasite living on another planet
Q4. Which one of the following is true for fungi?
(a) They are phagotrophic
(b) They lack a rigid cell wall
(c) They are heterotrophs
(d) They lack a nuclear membrane
Q5. Five kingdom system of classification suggested by R.H. Whittaker is NOT based on:
(a) Presence or absence of a well-defined nucleus
(b) Mode of reproduction
(c) Mode of nutrition
(d) Complexity of body organization
Q6. Archaebacteria differ from eubacteria in:
(a) Cell membrane
(b) Mode of nutrition
(c) Cell shape
(d) Mode of reproduction
Q7. Viruses have:
(a) DNA enclosed in a protein coat
(b) Prokaryotic nucleus
(c) Single chromosome
(d) Both DNA and RNA

CASE STUDY 1:

Reproduction in fungi can take place by vegetative means – fragmentation, fission and budding. Asexual reproduction is by spores called conidia or sporangiospores or zoospores, and sexual reproduction is by oospores, ascospores and basidiospores. The various spores are produced in distinct structures called fruiting bodies. The sexual cycle involves the following three steps:
Fusion of protoplasms between two motile or non-motile gametes called plasmogamy. Fusion of two nuclei called karyogamy.
Meiosis in zygote resulting in haploid spores.
When a fungus reproduces sexually, two haploid hyphae of compatible mating types come together and fuse. In some fungi the fusion of two haploid cells immediately results in diploid cells (2n). However, in other fungi (ascomycetes and basidiomycetes), an intervening dikaryotic stage (n + n, i.e., two nuclei per cell) occurs; such a condition is called a dikaryon and the phase is called dikaryophase of fungus. Later, the parental nuclei fuse and the cells become diploid. The fungi form fruiting bodies in which reduction division occurs, leading to formation of haploid spores.

(1) _____Hyphae are without septa and filled with multinucleated cytoplasm.
(a) Septate
(b) Nucleated
(c) Coenocytic
(d) Both a and c
(2) _____is the only single-celled fungi organism.
(a) Penicillium
(b) Yeast
(c) Mycorrhiza
(d) Both a and b
(3) What is saprophytic fungi?
(4) Give reason – why fungi are referred as cosmopolitan organism?
(5) Name the fungi which is responsible for rusting disease in wheat plant.

CASE STUDY 2:

Phycomycetes – Members of phycomycetes are found in aquatic habitats and on decaying wood in moist and damp places or as obligate parasites on plants. The mycelium is aseptate and coenocytic. Asexual reproduction takes place by zoospores (motile) or by aplanospores (non-motile). These spores are endogenously produced in sporangium. A zygospore is formed by fusion of two gametes. These gametes are similar in morphology (isogamous) or dissimilar (anisogamous or oogamous). Some common examples are Mucor, Rhizopus (the bread mould) and Albugo (the parasitic fungi on mustard).
Ascomycetes – Commonly known as sac-fungi, the ascomycetes are mostly multicellular, e.g., Penicillium, or rarely unicellular, e.g., yeast (Saccharomyces). They are saprophytic, decomposers, parasitic or coprophilous (growing on dung). Mycelium is branched and septate. The asexual spores are conidia produced exogenously on the special mycelium called conidiophores. Conidia on germination produce mycelium. Sexual spores are called ascospores which are produced endogenously in sac like asci (singular ascus). These asci are arranged in different types of fruiting bodies called ascocarps. Some examples are Aspergillus, Claviceps and Neurospora. Neurospora is used extensively in biochemical and genetic work. Many members like morels and trufles are edible and are considered delicacies.
Basidiomycetes –Commonly known forms of basidiomycetes are mushrooms, bracket fungi or puffballs. They grow in soil, on logs and tree stumps and in living plant bodies as parasites, e.g., rusts and smuts. The mycelium is branched and septate. The asexual spores are generally not found, but vegetative reproduction by fragmentation is common. The sex organs are absent, but plasmogamy is brought about by fusion of two vegetative or somatic cells of different strains or genotypes. The resultant structure is dikaryotic which ultimately gives rise to basidium. Karyogamy and meiosis

take place in the basidium producing four basidiospores. The basidiospores are exogenously produced on the basidium (pl.: basidia). The basidia are arranged in fruiting bodies called basidiocarps. Some common members are Agaricus (mushroom), Ustilago (smut) and Puccinia (rust fungus).

(1) The bread mould fungi belongs to

(a) Basidiomycetes _____

(b) Phycomycetes

(c) Ascomycetes

(d) Deuteromycetes

(2) Ascomycetes fungi are characterised by presence of .

(a) Presence of asci _____

(b) Presence of Basidium

(c) Mycelium without septa

(d) Both a and c

(3) What is mean by anisogamousgametes?

(4) Name the fungi which is commonly known as smut fungi?

(5) Give reason – why ascomycetes are termed as sac fungi?

Short Answer Type Questions:

Q10. What organisms are known as 'Jokers of Plant Kingdom'?

Q11. What are distributed organisms which are not included in any kingdom?

Q12. Name the fungus that causes 'rust of wheat'.

Q13. Why are red tides caused and why are they harmful?

Q14. Give one example of a fungus as a source of antibiotics?

Long Answer Type Questions:

Q15. Discuss the salient features of viruses with the help of a diagram?

Q.16. What are the characteristic features of euglenoids?

Q17. Some symbiotic organisms are very good pollution indicators and are composed of a chlorophyllous and non-chlorophyllous member. Describe them.

1. If E and G respectively denote energy and gravitational constant, then E/G has the dimensions of: *(2021)*

(a) $[M][L^{-1}][T^{-1}]$ (b) $[M][L^{0}][T^{0}]$

(c) $[M^{2}][L^{-2}][T^{-1}]$ (d) $[M^{2}][L^{-1}][T^{0}]$

2. A screw gauge gives the following readings when used to measure the diameter of a wire *(2021)*

Main scale reading : 0 mm

Circular scale reading : 52 divisions

Given that 1 mm on main scale corresponds to 100 divisions on the circular scale. The diameter of the wire from the above data is:

(a) 0.026 cm (b) 0.26 cm

(c) 0.052 cm (d) 0.52 cm

3. If force [F], acceleration [A] and time [T] are chosen as the fundamental physical quantities. Find the dimensions of energy. *(2021)*

(a) [F] [A] $[T^{2}]$ (b) [F] [A] $[T^{-1}]$

(c) [F] $[A^{-1}]$ [T] (d) [F] [A] [T]

4. A screw gauge has least count of 0.01 mm and there are 50 divisions in its circular scale.
The pitch of the screw gauge is: *(2020)*

(a) 0.25 mm (b) 0.5 mm

(c) 1.0 mm (d) 0.01 mm

5. Taking into account of the significant figures, what is the value of 9.99 m – 0.0099 m? *(2020)*

(a) 9.98 m (b) 9.980 m

(c) 9.9 m (d) 9.9801 m

6. Dimensions of stress are : *(2020)*

(a) $[ML^{2}T^{-2}]$ (b) $[ML^{0}T^{-2}]$

(c) $[ML^{-1}T^{-2}]$ (d) $[MLT^{-2}]$

7. The intervals measured by a clock given the following readings:
1.25 s, 1.24 s, 1.27 s, 1.21 s and 1.28 s. What is the percentage relative error is the observations?

(2020 Covid Re-NEET)

(a) 4% (b) 16%

(c) 1.6% (d) 2%

8. The angle of 1' (minute of arc) in radian is nearly equal to

(2020 Covid Re-NEET)

(a) 4.85×10^{-4} rad (b) 4.80×10^{-6} rad

(c) 1.75×10^{-2} rad (d) 2.91×10^{-4} rad

9. In an experiment, the percentage of error occurred in the measurement of physical quantities A, B, C and D are 1%, 2%, 3% and 4% respectively. Then the maximum percentage of error in the measurement of X, where $X = \frac{A^{2}B^{1/2}}{C^{1/3}D^{3}}$ will be *(2019)*

(a) $\left(\frac{3}{13}\right)\%$ (b) 16%

(c) – 10% (d) 10%

10. A student measured the diameter of a small steel ball using a screw gauge of least count 0.001 cm. The main scale reading is 5 mm and zero of circular scale division coincides with 25 divisions above the reference level. If screw gauge has a zero error of –0.004 cm, the correct diameter of the ball is *(2018)*

(a) 0.053 cm (b) 0.525 cm

(c) 0.521 cm (d) 0.529 cm

11. A physical quantity of the dimensions of length that can be formed out of c, G and $\frac{e^{2}}{4\pi\varepsilon_{0}}$ is [c is velocity of light, G is universal constant of gravitation and e is charge]: *(2017-Delhi)*

(a) $c^{2}\left[G\frac{e^{2}}{4\pi\varepsilon_{0}}\right]^{1/2}$ (b) $\frac{1}{c^{2}}\left[\frac{e^{2}}{G4\pi\varepsilon_{0}}\right]^{1/2}$

(c) $\frac{1}{c^{2}}G\frac{e^{2}}{4\pi\varepsilon_{0}}$ (d) $\frac{1}{c^{2}}\left[G\frac{e^{2}}{4\pi\varepsilon_{0}}\right]^{1/2}$

12. A student performs an experiment of measuring the thickness of a slab with a vernier caliper whose 50 divisions of the main scale. He noted that zero of the vernier scale is between 7.00 cm and 7.05 cm mark of the main scale and 23rd division of the vernier scale exactly coincides with the main scale. The measured value of the thickness of the given slab using the caliper will be: *(2017-Gujarat)*

(a) 7.73 cm (b) 7.23 cm

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13. Planck's constant (h), speed of light in vacuum (c) and Newton's gravitational constant (G) are three fundamental constants. Which of the following combinations of these has the dimension of length? *(2016 - II)*

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	Section A	
1	The number of atoms present in one mole of an element is equal to Avogadro number. Which of the following element contains the greatest number of atoms? a) 12g He b) 0.40g Ca c) 46g Na d) 4g He	
2	For the reaction, $2N_2H_4(l) + N_2O_4(l) \rightarrow 3N_2(g) + 4H_2O(l)$, 160 g N_2H_4 is mixed with 160 g N_2O_4, the yield of H_2O is _____. a) 120g b) 125 g c) 105 g d) 115 g	
3	- 122°C in Fahrenheit scale is a) - 317.6°F b) 237.6°F c) 317.6 °F d) - 187.6°F	
4	In the centigrade scale, - 40 °F becomes a) - 14 °C b) 25 °C c) - 20 °C d) - 40 °C	
5	The molecular formula shows: a) the exact number of different types of atoms present in a molecule of a compound. b) average decimal ratio of various atoms present in a compound. c) ratio of masses of various atoms present in a compound. d) whole number ratio of different types of atoms present in a molecule of a compound.	
6	The molar mass of $CaCO_3$ is: a) 90 amu b) 120 u c) 70g d) 100 g /mol	
7	0.2 M NaOH solution means: a) 0.2 moles of NaOH in 1 litre of solution b) 0.2 moles of NaOH in 10 mL of solution c) 0.2 moles of NaOH in 100 mL of solution d) 0.2 moles of NaOH in 0.5 litre of solution	
8	We have to prepare a 1000 mLsolution of 0.2 M NaOH from the available 1M solution. How much volume of 1M NaOH is required to be taken? a) 2 mL b) 200 mL c) 20 mL d) 0.2 mL	
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10	The molar mass of Al_2O_3 is: a) 92 u b) 82 u c) 102 u d) 42 u	
11	What is the mass percent of carbon in carbon dioxide? a) 3.4% b) 0.034% c) 28.7% d) 27.27%	
12	A solution is prepared by adding 2 g of a substance A to 18 g of water. Calculate the mass percent of the solute? a) 1.01% b) 11.11% c) 10.00 % d) 0.50 %	
13	The empirical formula and molecular mass of a compound are CH_2O and 180 g respectively. What will be the molecular formula of the compound? a) CH_2O b) $C_6H_{12}O_6$ c) $C_2H_4O_2$ d) $C_9H_{18}O_9$	
14	Molecular formula represents: a) average fractionall ratio of various atoms present in a compound b) the exact number of different types of atoms present in a molecule of a compound c) ratio of masses of various atoms present in a compound d) whole number ratio of different types of atoms present in a molecule of a compound	
15	**Assertion (A):** Atoms can neither be created nor be destroyed. **Reason (R):** Under similar conditions of temperature and pressure, an equal volume of gases does not contain an equal number of atoms. a) Both A and R are true and R is the correct explanation of A. b) Both A and R are true but R is not the correct explanation of A. c) A is true but R is false. d) A is false but R is true.	
16	**Assertion (A):** The balancing of chemical equations is based on the law of conservation of mass. **Reason (R):** Total mass of reactants is equal to the total mass of products.	

	a) Both A and R are true and R is the correct explanation of A. b) Both A and R are true but R is not the correct explanation of A. c) A is true but R is false. d) A is false but R is true.	
17	**Assertion (A):** Each side of a cube is measured to be7.203m. What is the volume of the cube to appropriate significant figure373.7m^3 . **Reason (R):** The mass of one mole of a substance in grams is called its average atomic mass. a) Both A and R are true and R is the correct explanation of A. b) Both A and R are true but R is not the correct explanation of A. c) A is true but R is false. d) A is false but R is true.	
18	**Assertion (A):** Element can formdifferent compound. **Reason (R):** Element is the pure form of a substance containing the same kind of atoms. a) Both A and R are true and R is the correct explanation of A. b) Both A and R are true but R is not the correct explanation of A. c) A is true but R is false. d) A is false but R is true.	
19	**Assertion (A):** Atomicity of oxygen is 2. **Reason (R):** 1 mole of an element contains 6.023×10^{23} atoms. a) Both A and R are true and R is the correct explanation of A. b) Both A and R are true but R is not the correct explanation of A. c) A is true but R is false. d) A is false but R is true.	
20	**Assertion (A):** 22.4 L of N_2 at NTP and 5.6 LO_2 at NTP contain equal number of molecules. **Reason (R):** Under similar conditions of temperature and pressure all gases contain equal number of molecules. a) Both A and R are true and R is the correct explanation of A. b) Both A and R are true but R is not the correct explanation of A. c) A is true but R is false. d) Both A and R are false.	
21	**Assertion (A):** Molar volume of gases change considerably with temperature and pressure. **Reason (R):** Molar volume of a substance is the volume occupied by 1 mole of the substance. a) Both A and R are true and R is the correct explanation of A. b) Both A and R are true but R is not the correct explanation of A. c) A is true but R is false. d) A is false but R is true.	
22	**Assertion (A):** Both 106 g of sodium carbonate and 12 g of graphite have the same number of carbon atoms. **Reason (R):** Both 106 g of sodium carbonate and 12g of graphite contains 1 g atom of carbon atoms. a) Both A and R are true and R is the correct explanation of A. b) Both A and R are true but R is not the correct explanation of A. c) A is true but R is false. d) A is false but R is true.	
23	**Assertion (A):** 1 mol of O and 1 mol of O_2 contain equal number of particles. **Reason ():** 1 mol of molecules is always double than 1 mol of atoms in all diatomic molecules. a) Both A and R are true and R is the correct explanation of A. b) Both A and R are true but R is not the correct explanation of A. c) A is true but R is false. d) A is false but R is true.	
24	**Assertion (A):** One mole of SO_2 contains double the number of molecules present in one mole of O_2 . **Reason (R):** Molecular weight of SO_2 is double to that of O_2 . a) Both A and R are true and R is the correct explanation of A. b) Both A and R are true but R is not the correct explanation of A. c) A is true but R is false. d) A is false but R is true.	

25	**Assertion (A):** The percentof the calcium in $Ca_3(PO_5)_2$ is48.71%. **Reason (R):** Mass percent is the mass of the element or solute divided by the mass of the compound or solute. a) Both A and R are true and R is the correct explanation of A. b) Both A and R are true but R is not the correct explanation of A. c) A is true but R is false. d) A is false but R is true.	
26	**Assertion (A):** Empirical formula of glucose is HCHO. **Reason (R):** Molecular formula of glucose will also be equal to HCHO. a) Both A and R are true and R is the correct explanation of A. b) Both A and R are true but R is not the correct explanation of A. c) A is true but R is false. d) A is false but R is true.	
27	For precious stone, carat is used for specifying its mass. If 1 carat = 3.08647 grains (a unit of mass) and 1 gram = 15.4324 grains. Find the total mass in kilogram of a ring that contains 0.700 carat diamond and 5.00 gram gold.	
28	Calculate molecular mass if 1L of a gas at STP weighs 1.97g.	
29	A solution is prepared by adding 2 g of a substance A to 18 g of water. Calculate the mass per cent of the solute.	
30	Calculate the percentage of N in NH_3 molecule.	
	Section B	
31	5.975 g of the higher oxide of metal gave 5.575 g of lower oxide on heating. The quantity of the loweroxide gave 5.175 g of metal on reduction. Prove thatthese results are in accordance with the law ofmultiple proportions.	
32	Calculate 1. $(5.7\times 10^{-4}) \times (4.2 \times 10^{-2})$ 2. $(5.7\times 10^{-5}) + (4.2 \times 10^{-3})$	
33	Calculate the number of molecules present in 44.8 cm^3 of oxygen gas at 273 K and 2 atmosphere pressure.	
34	Calculate ..molecular masses of the following: 1. H_2O 2. CO_2 3. CH_4	
35	Calculate the mass percentage of each element of water.	
36	Chlorophyll, the green colouring matter of plants contains 2.68% magnesium by weight. Calculate the number of magnesium atoms in 2.00 g of chlorophyll (Atomic mass of Mg = 24).	
37	Calculate the mass percent of different elements present in sodium sulphate (Na_2SO_4)	
38	Determine the empirical formula of an oxide of Iron which has 69.9° % iron and 30.1% dioxygen by mass.	
39	Determine the molecular formula of an oxide of iron in which the mass per cent of iron and oxygen are 69.9 and 30.1 respectively.	
40	How many significant figures should be present in the answer of the following calculations? 1. $\frac{0.02856\times 298.15\times 0.112}{0.5785}$ 2. 5×5.364 3. $0.0125 + 0.7864 + 0.0215$	
41	What do you mean by significant figures?	
42	Write main points of Dalton's atomic theory.	
43	Calculate molecular mass of glucose ($C_6H_{12}O_6$) molecule.	
44	What volume of 10M HCl and 3M HCl should be mixed to obtain 1L of 6M HCl solution?	
45	Define molality. How does molality depend on temperature?	
46	In three moles of ethane (C_2H_6), calculate the following: 1. Number of moles of carbon atoms. 2. Number of moles of hydrogen atoms. 3. Number of molecules of ethane.	
47	What is the concentration of sugar ($C_{12}H_{22}O_{11}$) in mol L^{-1} if its 20 g are dissolved in enough water to make of final volume up to 2L?	
48	How are 0.50 mol Na_2CO_3 and 0.50 M Na_2CO_3 different?	
49	Boron occurs in nature in the form of two isotopes having atomic mass 10 and 11. What are the percentage abundances of two isotopes in a sample of boron having average atomic mass 10.8?	
	Section C	
50	Calculate the molecular mass of the following. 1. H_2O 2. CO_2	

	3. CH_4	
51	1. Assuming the density of water to be 1g/cm^3 , calculate the volume occupied by one molecule of water. 2. Assuming the water molecule to be spherical, calculate the diameter of the water molecule. 3. Assuming that oxygen atom occupies half of the volume occupied by the water molecule, calculate approximately the diameter of the oxygen atom.	
52	A solution contains 25 % water, 25 % ethanol and 50 % acetic by mass. Calculate the mole fraction of each component.	
53	Calculate the number of atoms in each of the following 1. 52 mole of Ar 2. 52 u of He 3. 52 g of He.	
54	Calculate the number of atoms in each of the following: 1. 52 moles of He 2. 52 u of He 3. 52 g of He	
55	A sugar syrup of weight 214.2 g contains 34.2 g of sugar (C_{12} H $_{22}$ O $_{11}$). Calculate 1. molal concentration, and 2. mole fraction of sugar in the syrup	
56	45.4 L of dinitrogen reacted with 22.7 L of dioxygen and 45.4 L nitrous oxide was formed. The reaction is given below $2N_2(g) + O_2(g) \rightarrow 2N_2O(g)$ Which law is being obeyed in this experiment? Write the statement of the law.	
57	Three oxides of nitrogen contained 63.6%, 46.7% and 30.4% nitrogen respectively. Show that these figures illustrate the law of multiple proportions.	
58	Copper oxide was prepared by the following methods. 1. In one case, 1.75 g of the metal was dissolved in nitric acid and igniting the residual copper nitrate yielded 2.19 g of copper oxide. 2. In the second case, 1.14 g of metal dissolved in nitric acid were precipitated as copper hydroxide by adding caustic alkali solution. The precipitated copper hydroxide after washing, drying and heating yielded 1.43 g of copper oxide. 3. In the third case, 1.46 g of copper when strongly heated in a current of air yielded 1.83 g of copper oxide. Show that the given data illustrate the law of definite composition.	
	Section D	
59	A compound made up of two elements A and B has A = 70 %, B = 30 %. Their relative number of moles in the compound are 1.25 and 1.88. Calculate 1. atomic masses of the elements A and B 2. molecular formula of the compound, if its molecular mass is found to be 160.	
60	Calculate the number of moles in each of the following: 1. 392 g of sulphuric acid 2. 44.8 litres of sulphur dioxide at N.T.P. 3. 6.022× 10 ^{22} molecules of oxygen 4. 8g of calcium	
61	1. Calculate the atomic mass (average) of chlorine using the following data : 2. In three moles of ethane (C_2 H $_6$), calculate the following: a. Number of moles of carbon atoms b. Number of moles of hydrogen atoms c. Number of molecules of ethane	
62	1. A sample of drinking water was found to be severely contaminated with chloroform, $CHCl_3$, supposed to be carcinogenic in nature. The level of contamination was 15 ppm (by mass). a. Express this in percent by mass. b. Determine the molarity of chloroform in the water sample. 2. Calculate the molarity of a solution of ethanol in water in which the mole fraction of ethanol is 0.040.	
63	1. The density of the water at room temperature is 1.0g/mL. How many molecules are there in a drop of water if its volume is 0.05 mL? 2. An alloy of iron (53.6 %), nickel (45.8 %) and manganese (0.6 %) has a density of 8.17 g cm^{-3} . Calculate the number of Ni atoms present in the alloy of dimensions 10.0 cm × 20.0 cm × 15.0 cm.	
64	A solution is prepared by adding 2 g of a substance A to 18 g of water. Calculate the mass percent of the solute. Also define volume percentage and parts per million (ppm).	

	% natural abundance	Molar mass
^{35} CI	75.77	34.9689
CI	24.23	36.9659

65 A welding fuel gas contains carbon and hydrogen only. Burning a small sample of it in oxygen gives 3.38 g carbon dioxide, 0.690 g of water and no other products. A volume of 10.0 L (measured at S.T.P) of this welding gas is found to weigh 11.6 g. Calculate

1. empirical formula,
2. molar mass of the gas, and
3. molecular formula.

66 A compound on analysis was found to contain C = 34.6%, H = 3.85% and O = 61.55% Calculate the empirical formula.

67 An organic substance containing carbon, hydrogen and oxygen gave the percentage composition as C = 40.687%, H = 5.085%.
The vapourdensity of the compound is 59. Calculate the molecular formula of the compound.

68
1. Give an example of a molecule in which
   a. The ratio of the molecular formula and the empirical formula is 6: 1.
   b. Molecular weight is two times of the empirical formula weight.
   c. The empirical formula is CH_2 Oand the ratio of molecular formula weight and empirical formula weight is 6.
2. 1.615 g of anhydrous $ZnSO_4$ was left in moist air. After a few days its weight was found to be 2.875 g. What is the molecular formula of hydrated salt?
   (At. masses: Zn= 65.5, S= 32, O=16, H= 1)

69 The following data were obtained when dinitrogen and dioxygen react together to form different compounds:

Mass of dinitrogen	Mass of dioxygen
14 g	16 g
14 g	32 g
28 g	32 g
28 g	80 g

1. Which law of chemical combination is obeyed by the above experimental data? Give its statement.
2. Fill in the blanks in the following conversations:
   a. 1 km = _____ mm = _____ pm
   b. 1 mg =_____ kg =_____ ng
   c. 1 mL =_____ L =_____ dm^3

70 Express the following in the scientific notation.

1. 0.000968
2. 15742
3. 90,00
4. $(5.7\times 10^{6}) \times (4.2 \times 10^{-2})$
5. $(6.8\times 10^{-9}) + (1.4 \times 10^{-2})$
6. $(4.56\times 10^{-3} + 2.62 \times 10^{-2})$
7. $(9.87\times 10^{-3} - 2.26 \times 10^{-4})$

71 Arrange the following in order of their increasing masses in gram:

1. one atom of silver,
2. one gram - atom of nitrogen,
3. one mole of calcium, carbon and
4. one mole of oxygen molecules,
5. 10^{23} atoms of carbon.

72 Which one of the following will have the largest number of atoms?

1. 1 g Au(s)
2. 1g Na(s)
3. 1g Li(s)
4. 1g of Cl_2 (g)