BIOLOGY ASSIGNMENT

CLASS – 9

a. Who proposed the cell theory? (1)

b. State the major features of cell theory. (2)

c. Write the differences between:- 1. Chromoplast/Chloroplast
2. Protoplasam/Cytoplasm. (2)

d. What are anthocyanin? Where are they found in the cell? (2)

e. State the location and function of:-

1. Adipose tissue

2. Striated Muscle

3. Columnar Epithelium. (3)

f. Write any two important features of meristematic tissue? (2)

g. Why are mitochondria called the 'Powerhouse' of the cell? (2)

h. Why are conducting tissue also called vascular tissue? What are it's two types? (2)

i. Draw a labelled diagram of animal cell. (3)

j. Name the different parts of a neuron. (1)

CHEMISTRY (CLASS – 9)

LANGUAGE OF CHEMISTRY

(Instruction: Revise chapter 'Language of Chemistry' of Class VIII)

Q1. What is a radical?

Q2. What do you mean by acid radical and basic radical? Explain with examples

Radical

Acid Radical (Anion part) ← Radical → Basic Radical (Cation part)
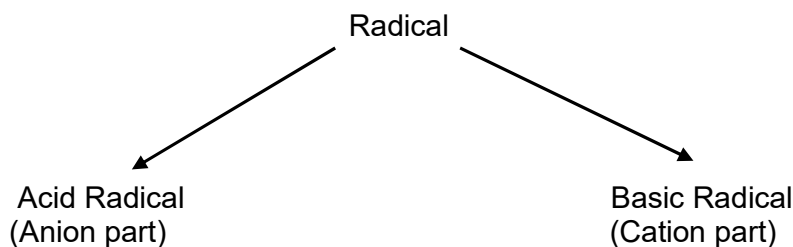
In NaCl the basic radical is Na^+ and the acid radical is Cl^-.
In K_2SO_4 the basic radical is K^+ and the acid radical is SO_4^{2-}
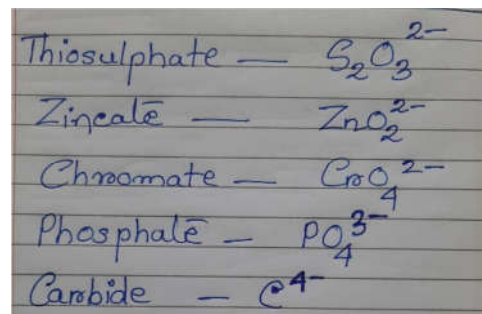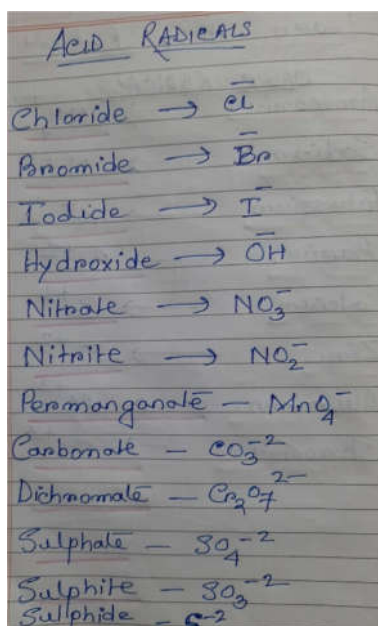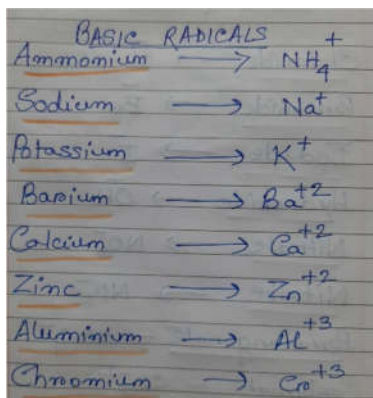
Q3. Write the symbol and valency of magnesium, zinc, and calcium.

Q4. Write the formulae of the following compounds and identify the acid and basic radicals:

   a. Calcium Phosphate
   b. Sodium sulphate
   c. Magnesium carbonate
   d.Potassium sulphate
   e. Zinc nitrate

Instruction: Learn the   *following Radicals* --------------

BASIC RADICALS +
- Ammonium → NH_4
- Sodium → Na^+
- Potassium → K^+
- Barium → Ba^{+2}
- Calcium → Ca^{+2}
- Zinc → Zn^{+2}
- Aluminium → Al^{+3}
- Chromium → Cr^{+3}

ACID RADICALS
- Chloride → Cl^-
- Bromide → Br^-
- Iodide → I^-
- Hydroxide → OH^-
- Nitrate → NO_3^-
- Nitrite → NO_2^-
- Permanganate → MnO_4^-
- Carbonate → CO_3^{-2}
- Dichromate → $Cr_2O_7^{2-}$
- Sulphate → SO_4^{-2}
- Sulphite → SO_3^{-2}
- Sulphide → S^{-2}

- Thiosulphate — $S_2O_3^{2-}$
- Zincate — ZnO_2^{2-}
- Chromate — CrO_4^{2-}
- Phosphate — PO_4^{3-}
- Carbide — C^{4-}

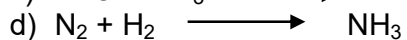Q5. Define a chemical   equation. Why should an
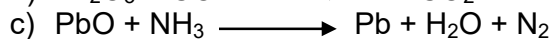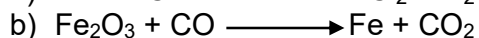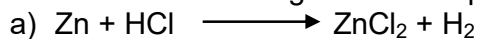
equation be balanced?

> *A chemical equation is the symbolic representation of a chemical reaction using the symbols and formulae of the substances involved in the reaction.*

An equation must be balanced in order to comply with the "Law of Conservation of matter".

Q6. What is variable valency? Give examples of two metals showing variable valency. (refer to book)

Q7. Balance the following chemical equations:
a) $Zn + HCl \longrightarrow ZnCl_2 + H_2$
b) $Fe_2O_3 + CO \longrightarrow Fe + CO_2$
c) $PbO + NH_3 \longrightarrow Pb + H_2O + N_2$
d) $N_2 + H_2 \longrightarrow NH_3$
e) $AgNO_3 \longrightarrow Ag + NO_2 + O_2$
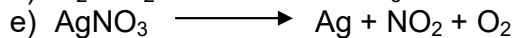
COMPUTER APPLICATIONS

STD 9

Q1. What are variables? Explain.

Q2. What are datatypes? Name and explain the various datatypes in JAVA.

Q3. Write a program to create variables of different types (integer, floating-point, character, String, boolean) and initialize them, then display the values of the variables with appropriate labels/messages.

Q4. What are Arithmetic operators? Explain the various Arithmetic operators used in JAVA.

Std. 9 (Project work) Economic Applications
Critically discuss Welfare definition and Scarcity definition of Economics (Definition, features and criticism)

STD 9   ENGLISH LANGUAGE

Write composition on the following topics(300-350 words)
1. You are a spectator at a cricket match. Trouble erupts suddenly in the stadium . You are a witness among the crowd. Give a vivid description of the scene.
2. Teenagers of today are more influenced by their friends than by their parents. Give your views for or against the statement.

Note: Students must write the assignment in golden eagle paper and submit in a file.

STD 9   ENGLISH LITERATURE

1. Discuss the relationship between Antonio and Bassanio. What does their friendship reveal about their character?
2. Explain the title of the play "The Merchant of Venice"

Note: Students must submit the assignment in golden eagle paper and submit in a file. Discuss the topics in details.

Std IX GEOGRAPHY

Map Pointing - On an outline map of the World mark and name the following : (Use colours - BLUE for rivers and all water masses, BROWN for mountains and peaks, ORANGE for plateaus : PLEASE USE ONLY PENCIL COLOURS)

Syllabus – Map Work – Nos. 2, 3, 4 & 5 on page no. "vii" (in the beginning of the book)

Maps Drawn – Seas and Oceans (pg no. 255/ Map -9), Gulfs, Bays, Straits (pg no. 256/ Map -10), Mountains (pg no. 257 / Map – 11), Plateaus (pg no. 259)

CHAPTER I – 1) Learn the features that make the Earth A UNIQUE PLANET

             2) Contribution made by Scientists and Geographers

             3) Learn about the evidences that prove the earth is a SPHERICAL

        heavenly body (pg nos. 5 & 6)

             4) The Shape of the Earth – GEOID (pg no. 6)

             5) Five important features that make the Earth as UNIQUE PLANET

        (pg nos. 7, 8, 9 – Optimum Distance, Hydrosphere, Atmosphere,

        Lithosphere & Biosphere)

        6) ECOSYSTEM – Definition and diagram – Fig 1.9/ pg no. 9

        7) The MOON – Why is life not possible on Moon (pg no. 10)

HOMEWORK : Write down in your Geography Homework Copy both the questions and the answers of the following questions of the *exercises* :- (pg no. 10)

    1. Answer the following questions in brief: 1, 4, 5, 8, 9, 12, 13 & 14

    2. Give reasons for the following: 1, 2, 3, 4, & 5

std - 9

प्रश्न-1 स्वस्थ शरीर में ही स्वस्थ मन का निवास होगा है 'इसे समझाते हुए अपने छोटे भाई को पत्र लिखें।

प्रश्न-2 आपकी दृष्टि में मित्र बनाते समय क्या-क्या बातें देखनी चाहिए? संक्षिप्त लेख लिखिए।

प्रश्न-3 काल की परिभाषा लिखें? काल के कितने भेद हैं उदाहरण सहित परिभाषित करें?

STD 9

HISTORY

1. Can you think of reasons why most civilisations started near the rivers ?
2. The early Vedic age and the later Vedic age, which according to you was more progressive in terms of society ?
3. What later developments in the Indian society and in the Hindu religion led to the start of Jainism and Buddhism ?
4. Can you think of reasons why most invaders came to India but eventually settled down in the country ?
5. Can you think of reasons why most invaders came to India from the northwestern borders of India.
6. Why is the preamble to the constitution of India also called the soul of the constitution ?
7. How many fundamental rights were originally in the constitution of India ? Which rights were later amended and removed and which were later added to the constitution ?
8. Even in the face of a national emergency, which fundamental right/rights cannot be suspended ? Which famous case in the history of Indian judiciary led to the ruling that not all rights can be suspended during a national emergency ?
9. Jainism and Buddhism developed in the Indian Subcontinent nearly in the same time but Buddhism spread to more parts of the world and found more followers than Jainism. Can you think of reasons why ?
10. If you were a child in the ancient Indus valley, what would an average day be like for you?

11. Reconstruct the life of an Indian female living in the later Vedic age.

Points to remember .

Read and understand the experiment.

In the Maths Practical Copy write down AIM, MATERIAL REQUIRED , METHODOLOGY , TABULAR COLUMN and CONCLUSION on the ruled page. DIAGRAM and CALCULATION on the plane page.

Follow the PROCEDURE properly to get the correct conclusion.

MATHS PRACTICAL COPY must be a soft cover Lab copy with atleast 50 to 60 pages.

EXPERIMENT NO. 1

AIM

To make a comparative study of Compound interest and Simple interest for a fixed sum invested for fixed period at a fixed rate of interest.
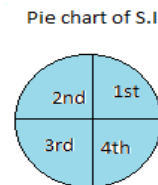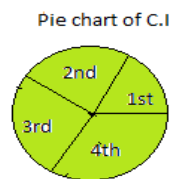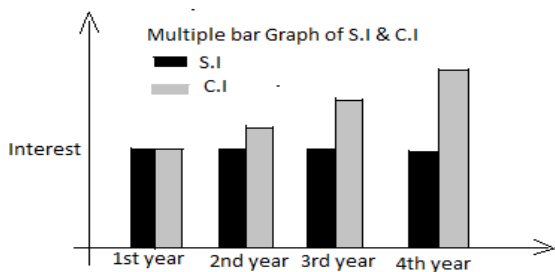
MATERIAL REQUIRED
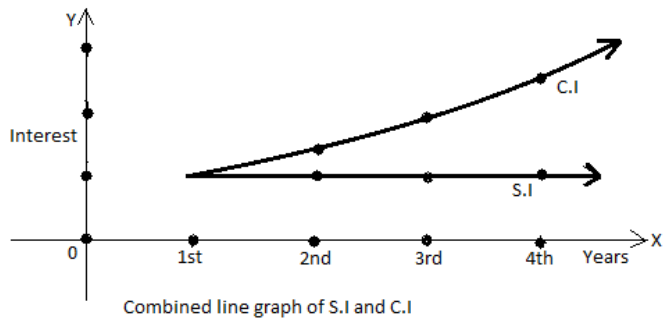
1. Graph papers.

2. Amount , Rate , Period

METHODOLOGY

Simple interest$= \dfrac{PRT}{100}$.

Compound interest for the nth year$= \dfrac{P_n RT}{100}$.

WhereP_n is the principal for nth year = Amount at the end of $(n-1)^{th}$year.

Multiple bar Graph of S.I & C.I

Pie chart of C.I

Pie chart of S.I

Combined line graph of S.I and C.I

PROCEDURE

Follow all the steps below in order.

Step 1. Calculate Simple interest for the given sum for the 1st year , 2nd year , 3rd year and for the 4th year by using the formula. Note down the calculated values on the observation table.

Step 2. Calculate Compound interest for the given sum for the 1st year , 2nd year , 3rd year and for the 4th year by using the formula. Note down the calculated values on the observation table.

Step 3. Draw the Graph's of the calculated data.

OBSERVATION TABLE

Investment = Rs 10000, Rate=-10% ,Time = 4 years

Year	Simple interest		Compound interest	
	Principal (P)	Interest	Principal (P)	Interest
1st year				
2nd year				
3rd year				
4th year				

Graphs

1. Multiple bar graph of S.I & C.I

2. Multiple bar graph of P & S.I

3. Multiple bar graph of P & C.I

4. Combined line Graph of S.I & C.I

CONCLUSION

From the above Graphical analysis It is clear that , investment in Financial institutions which offer interest on investment by C.I is ----------(better/worse)than the institution which calculate interest on investment by S.I for the same rate.

Therefore for investors the best option is ------(S.I / C.I).

RATIONAL NUMBERS – The numbers of the form $\frac{a}{b}$, where a and b are integers and $b \neq 0$ are known as rational numbers. Rational number is denoted by Q.

Remarks   i) 0 is a rational number. We can write $0 = \frac{0}{1} = \frac{0}{2} \dots \dots$

                ii) Every natural number is a rational number. $1 = \frac{1}{1}$, $2 = \frac{2}{1}$, etc.

                iii) Every integer is a rational number.

                iv) $\frac{1}{0}$ is not a rational number.

EQUIVALENT RATIONAL NUMBERS –

$$\frac{1}{2} = \frac{2}{4} = \frac{3}{6} = \dots\dots\dots\dots\dots\dots = \frac{15}{30}$$ are known as equivalent rational numbers.

SIMPLEST FORM – A rational number $\frac{a}{b}$ is said to be simplest form or lowest terms or irreducible form, if a and b are integers having no common factors other than 1 and $b \neq 0$.

For Example- The simplest form of $\frac{6}{9}$ is $\frac{2}{3}$

Two rational numbers $\frac{a}{b}$ and $\frac{c}{d}$ are called equal, written as $\frac{a}{b} = \frac{c}{d}$, if and only if $ad = bc$.

REPRESENTATION OF RATIONAL NUMBERS – Every rational number has been represented by one and only one point on the line l.

For Example $\frac{3}{4}$
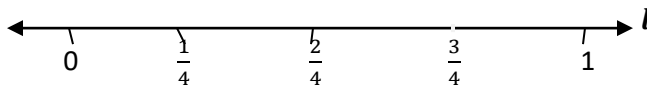
IMPORTANT RESULTS

1) **Let a and b be two rational numbers such that $a < b$ then $\frac{1}{2}(a + b)$ is a rational number lying between a and b.**

- **Find a rational number lying between $\frac{1}{3}$ and $\frac{1}{2}$.**

   Here $a = \frac{1}{3}$ **and** $b = \frac{1}{2}$,   **clearly $a < b$**

   A rational number lying between a and b **$= \frac{1}{2}(a + b)$**

$$= \frac{1}{2}\left(\frac{1}{3} + \frac{1}{2}\right)$$

$$= \frac{1}{2} * \frac{5}{6}$$

$$= \frac{5}{12} \quad \textbf{Ans.}$$

2) Let a and b be two rational numbers such that $a < b$, suppose we want to find n rational numbers between a and b.

Let $d = \frac{b-a}{n+1}$ then n rational numbers lying between a and b are

$$(a + d), \ (a + 2d), \ (a + 3d), \dots \dots \dots \dots \dots \dots \dots \dots \dots . (a + nd)$$

There are infinitely many rational numbers between two different rational numbers

- **Insert five rational numbers between 2 and 3.**
  Here, $a = 2$ **and** $b = 3$, **clearly** $a < b$
  We have to find 5 rational numbers between 2 and 3.

Let $d = \frac{3-2}{5+1}$

$$= \frac{1}{6}$$

Now, **1st rational number** $(a + d) = (2 + \frac{1}{6})$

$$= \frac{13}{6}$$

2nd rational number $(a + 2d) = (2 + 2 * \frac{1}{6})$

$$= \frac{7}{3}$$

3rd rational number $(a + 3d) = (2 + 3 * \frac{1}{6})$

$$= \frac{5}{2}$$

4th rational number $(a + 4d) = (2 + 4 * \frac{1}{6})$

$$= \frac{8}{3}$$

5th rational number $(a + 5d) = (2 + 5 * \frac{1}{6})$

$$= \frac{17}{6}$$

ASSIGNMENT I

1. Insert a rational number between $\frac{2}{9}$ and $\frac{3}{8}$
2. Insert three rational numbers between 0 and 0.1
3. Insert three rational numbers between $\frac{1}{3}$ and $\frac{1}{4}$
4. Insert six rational numbers between $\frac{1}{2}$ and $\frac{1}{3}$
5. Insert two rational numbers between $-\frac{1}{3}$ and $-\frac{1}{2}$

IRRATIONAL NUMBERS – A number cannot be expressed in the form $\frac{a}{b}$, where a and b are integers and $b \neq 0$ and p and q have no common factor except 1is called an irrational number.

"OR"   Non- terminating, non- repeating decimals are called irrational numbers.

i)   0.01001000100001……….. is a non terminating and non repeating decimal and that is irrational.

ii)   If m is a positive integer which is not a perfect square, then $\sqrt{m}$ is irrational.
   $\sqrt{2}$, $\sqrt{3}$, $\frac{1}{\sqrt{5}}$, $2 + \sqrt{3}$, etc.

iii)   If m is a positive integer which is not a perfect cube, then $\sqrt[3]{m}$ is irrational.
   $\sqrt[3]{2}$, $\sqrt[3]{3}$,   etc.

iv) π is a number whose exact value is not $\frac{22}{7}$. π has value which is non terminating and non repeating, so π is irrational while $\frac{22}{7}$ is rational number.

(If a is any natural number and p is a prime number such that p divides a^2, then p divides a.)

1. Prove that $\sqrt{2}$ is an irrational number.
If possible, let $\sqrt{2}$ be a rational number, then

$$\sqrt{2} = \frac{a}{b}, \quad b \neq 0$$

Or $2 = \frac{a^2}{b^2}$ (squaring both sides)

Or $2b^2 = a^2$ ……………………………….(i)

Or   2 divides a^2
    2 divides a (since 2 is prime)
Let $a = 2c$ ……………………………….. (ii)

From (i) and (ii), $2b^2 = 4\,c^2$
        Or $b^2 = 2c^2$
  Or   2 divides b^2
    2 divides b
Thus, 2 is a common factor of a and b (except 1)
        Contradiction
      Our supposition is wrong
    Hence, $\sqrt{2}$ is an irrational number.

2. Prove that $7 - 2\sqrt{3}$ is an irrational number.
If possible, let $7 - 2\sqrt{3}$ be a rational number. Then
    $7 - 2\sqrt{3} = r$ **(say)**
Or $7 - r = 2\sqrt{3}$
Or $\frac{7-r}{2} = \sqrt{3}$

$\frac{7-r}{2}$ **is rational but $\sqrt{3}$ is an irrational.**
      Contradiction
     Our supposition is wrong
Hence, $7 - 2\sqrt{3}$ is an irrational number.

ASSIGNMENT II

1. Prove that $\sqrt{5}$ is an irrational number.
2. Prove that $\frac{2}{5}\sqrt{3}$ is an irrational number.
3. Prove that $5 + \sqrt{2}$ is an irrational number.
4. Prove that $\frac{1}{\sqrt{2}}$ is an irrational number.
5. Prove that $\sqrt{2} + \sqrt{5}$ is an irrational number.

REAL NUMBERS – The collection of all rational numbers together with all irrational numbers are called real numbers. Which are denoted by R.
     (EVERY REAL NUMBER IS EITHER RATIONAL OR IRRATIONAL NUMBER)

DECIMAL EXPANSSION OF REAL NUMBERS –

CASE I - When the remainder becomes zero.
$$\frac{13}{50} = 0.26 \qquad \text{Terminating decimal}$$
CASE II – When the remainder never becomes zero.
$$\frac{10}{3} = 3.333333\ldots\ldots..$$
$$= 3.\overline{3} \qquad \text{Non terminating recurring (repeating)}$$

REMARKS: 1)   All integers positive, zero or negative are terminating decimals.
          2) The decimal expansion of a rational $\frac{a}{b}$ where a and b are integers, b>0, p, q have no
              Common factor other than 1 is:
                   i)   Terminating if q can be expressed as $q = 2^m 5^n$ where m and n are
                       whole numbers.
                   ii)   Non –terminating if q has a prime factor other than 2 or 5

ASSIGNMENT III

1. Locate $\sqrt{5}$ on number line.
2. Without long division, state whether the following rational numbers will have terminating or non terminating repeating decimal expansion:
    i) $\frac{17}{8}$ ii)$\frac{77}{210}$
3. Express $0.\overline{001}$ as a fraction.
4. Insert an irrational number between 3 and 5.
5. Find a rational number between $\sqrt{5}$ and $\sqrt{7}$.

SURDS -: $\sqrt[n]{a}$ **is a surd (of order n) if**
         i) a is a positive rational number
         ii) n(> 1) is a positive integer
         iii)$\sqrt[n]{a}$ is not a rational number
   $\sqrt{2},$ $\sqrt{3},$ are surds of order 2
   $\sqrt[3]{2},$ $\sqrt[3]{3}$ are surds of order 3

LAWS OF SURDS (REDICALS)
     i) $(\sqrt[n]{a})^n = a$

     ii) $\sqrt[n]{a}\sqrt[n]{b} = \sqrt[n]{ab}$

     iii) $\frac{\sqrt[n]{a}}{\sqrt[n]{b}} = \sqrt[n]{\frac{a}{b}}$

SOME FACTS ABOUT SURDS OF ORDER 2

1. If a and b are positive rational numbers, then

    i) $\sqrt{ab} = \sqrt{a}\sqrt{b}$ ii) $\sqrt{\frac{a}{b}} = \frac{\sqrt{a}}{\sqrt{b}}$

    iii) $(\sqrt{a} + \sqrt{b})(\sqrt{a} - \sqrt{b}) = a - b$ iv) $(a + \sqrt{b})(a - \sqrt{b}) = a^2 - b$

    v) $(\sqrt{a} + \sqrt{b})^2 = a + 2\sqrt{ab} + b$ vi) $(\sqrt{a} - \sqrt{b})^2 = a - 2\sqrt{ab} + b$

2. If $a, b, c \ and \ d$ are rational numbers, $\sqrt{p}$ is irrational number and $+b\sqrt{p} = c + d\sqrt{p}$, then $a = c \ and \ b = d$

ASSIGNMENT- IV

1. Prove that $\sqrt[3]{3}$ is an irrational number.
2. Write in ascending order $3\sqrt{2}, \ 2\sqrt{3}, \ \sqrt{15}, \ 4$
3. Simplify $(5 + \sqrt{5})(5 - \sqrt{5})$
4. Arrange the following in ascending order $\sqrt[3]{2}, \ \sqrt{3}, \ \sqrt[6]{5}$

RATIONALISATION – Suppose we are given a number whose denominator is irrational. Then the process of converting its denominator to a rational number by multiplying its numerator and denominator by a suitable number, is called rationalization.

Rationalizing factor (RF) – Each surd is called R.F. of the other surd.

ASSIGNMENT – V

1. Rationalization of denominator $\dfrac{3}{4 - \sqrt{7}}$
2. If $a = 2 + \sqrt{3}$, then find the value of $a - \dfrac{1}{a}$
3. If $x = 9 + 4\sqrt{5}$, then find the value of $\sqrt{x} - \dfrac{1}{\sqrt{x}}$
4. If $x = 2 - \sqrt{3}$, then find the value of $(x - \dfrac{1}{x})^3$
5. Given a and b are rational numbers, find a and b.

$$\frac{3 - \sqrt{5}}{3 + 2\sqrt{5}} = -\frac{19}{11} + a\sqrt{5}$$

SYSTEM OF UNIT AND UNITS IN S.I SYSTEM

A) Measurement – It is the process of comparison of the given physical quantity with the known standard quantity of the same nature.

B) Unit – The standard quantity used to measure the given physical quantity is called Unit.

Physical quantity = (numerical value) X (unit)
Example – 10 metre

C) Choice of unit

D) Kinds of unit

(i) Fundamental or Basic Units

Example – Units of mass , length, time, temperature, current and amount of substance.

(ii) Derived units

Example – Area, Volume, Speed etc.

E) Systems of unit

(i) C.G.S system

(ii) F.P.S system

(iii) M.K.S system

F) Use of Prefix with a Unit

ASSIGNMENT

Exercise 1(A)

Question No. 1 to 8