DOON INTERNATIONAl SCHOOL,SRINAGAR

SUBJECT – Computer

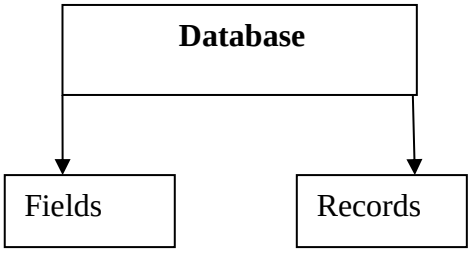
Assignment:II

Grade:VII

Chapter:- Using Excel As Database.

- The objective of this assignment is to make students acquainted with the usage of Database (Microsoft Excel) and also the various objects in it.

A **database** is an organized way of storing information .It helps us to manage and access large amount of information quickly and efficiently. It is a collection of information related to a particular subject, Such as maintaining addresses and phone numbers, a list of library books, keeping students 'records pertaining to academic and co-curricular achievements, keeping employees information etc. It helps the users to organize, retrieve, sort and edit data as per their requirements.



Database consists of fields and records.

1.Field :- A column within a table that contains only one type of information is called a field . The columns provide the structure according to which the rows are composed. E.g Roll No., Name etc

2.**Record: -**A record is a collection of fields. A record displays all the information about a single entity .

Field name:-It is a column label for the field in a database. All the field names appear in one row.

Rules To Enter Field Names.

- Each field name should be placed in a separate cell.
- Field names should be unique.

Form:- A form is a dialog box that provides an easy way to enter or display a complete row of information ,or record .It has text boxes to enter data in fields and commands buttons to manipulate the data.

Before adding a record in the form, the worksheets must have field names at the top of each column. Microsoft Excel uses these field names to enter records in a form.

Form has the following features:

- It displays one record at a time. It can be used to add new records and change the existing records.
- Any record can be deleted. It also helps to view the record, which matches the specified records.

In Ms Excel 2007,Forms are hidden.

To find the Forms, click on **Office Button** > **Excel options**. Click on the **Customize** tab from the **Excel Options** dialog box .Click on the drop-down list of **Choose Commands From and** click on **Commands Not In The Ribbon.** Select **Form** from the displayed list and click on **Add.** Click on **OK** and you will find the **Form** button on the **Quick Access Toolbar.**

- Using the data form, we can add new records . It is also used to search the specific values.
- Form also provides the option to delete a particular record.

SORTING DATA

Sorting means arranging the given data according to a particular field either in ascending or descending order in a worksheet. once the data is organized , it becomes very easy to work with.

Filtering Data

Ms Excel provides several ways to analyze data in a list. The filter feature allows you to see only those records that you want to see while it hides away the rest of the data temporarily from the view. You can filter a list to display records that meet specific criteria by using Auto Filter command.

To inactivate the filter, click on Clear button or click on the filter symbol on the field name and select Clear filter from total option.

Using Advanced Filter.

Advanced filter option is used to filter the data in multiple fields using specified criteria, or to copy the filtered records to a different location, or to find unique records.

Using Data Validation.

Data validation is used to restrict the cell entries within a specified range.

Remove duplicates button is under **Data tab** and is used to remove the duplicates value from a column.

Adding Subtotal in Database in a database help us to manage and analyze the data.To apply subtotals ,the database must be sorted.

To remove all the subtotals in your worksheet, click the worksheet and select Data >Subtotal. In the dialog box ,click on Remove ALL button.

Analyzing Data With Pivot Table.

Pivot table is a powerful tool for consolidating, summarizing and presenting data.

On the basis of understanding of chapter answer the following questions:-

1.What are the advantage of using filters?
2.What is the importance of using form?
3.Write the steps for deleting the form?
4.What is advanced filter option used for?
5.How Sorting is different from Filtering the data?

Practical work :-

- Students should first make a worksheet on daily expenses of a grocery store using forms And then in that worksheet should sort, filter and advance filter the data.

- Simran is a Public relation manager in a company. She has prepared a list of her clients along with their birthdays. She now wants to find out the names of person's whose birthday falls in the month of September. Help her to do this task using Auto Filter command feature.

S.NO.	Client's name	Client's Designation	Date of birth	Salary

Note:-All the textual and additional questions to be done on fair notebook.

DOON INTERNATIONAL SCHOOL, SRINAGAR
SUBJECT: Chemistry
Assignment:II
Grade:VII
Chapter: Heat and its effects

Instructions:

- *Students are to read and understand the chapter on their own before initiating to respond to the given assignment.*
- *The objective of this assignment is to make the students acquainted with;*
- *To get a detailed description of heat.*
- *To know the different forms of heat.*
- *Effect of heat in our daily lives.*

WHAT IS HEAT?

Until the end of the eighteenth century scientists believed that heat was a kind of fluid, which was gained by a body when it was heated, and lost when it was cooled. This fluid was named ***'caloric'****. However, this theory could not explain several observations, for example, why two bodies when rubbed together become warm. The experiments conducted by* ***Count Rumford*** *and* ***James Prescott*** *in the beginning of the nineteenth century established that heat is a form of energy, known as thermal energy.*

Many other forms of energy can be converted into heat energy, and heat energy can be converted to other forms of energy. For example, When you rub your hands together, mechanical energy gets converted to heat energy and your hands become warm.

- *When fuel is burnt, chemical energy Stored in the fuel gets converted to heat energy.*
- *The heat energy of burning petrol is converted to mechanical energy in a car.*
- *In an electric heater electrical energy is converted to heat energy.*
- *In a powerhouse, heat energy of burning coal is converted into electrical energy. Its molecules gain energy and start moving faster. The more we heat the substance, the faster its molecules move. Heat energy is, therefore, the energy of movement of molecules.*

EFFECTS OF HEAT:

Fill a vessel up to the brim with water. Drop a few pieces of vegetables in it. Heat the vessel, and observe the changes that happen. You will observe the following:

- *The water becomes warmer, that is, its temperature rises. Thus, heat causes increase in temperature.*
- *As the water heats up, some of it overflows, i.e. its volume increases. Thus, heat causes expansion.*
- *As the water boils, steam comes out of the water, i.e. water changes its state. Thus, heat causes change of state.*
- *After the water has boiled for a few minutes, the vegetables become soft and their taste changes, i.e. the vegetables get cooked. Cooking of vegetables is a chemical change. Thus, heat causes chemical changes.*
- *If the water is examined under a powerful microscope before and after boiling, it is found that many bacteria that were present in the water have died. Thus, heat affects living organisms. This is because every organism can tolerate a definite range of temperature. Its activities and survival. Its activities and survival get affected at temperatures higher or lower than the normal temperature.*

EXPANSION:

Suppose that a number of children are standing in a corner of a hall. They are moving around a little to talk to each other. Suddenly music is switched on. The children start dancing and moving around more. Naturally, they will spread out more and occupy a larger part of the hall.

Similarly, when we heat a substance the movement of its molecules increases. This increases the average distance between the molecules. Therefore, the space occupied by the molecules, that is, the volume of the substance, increases. We say that heat causes expansion.

Expansion in solids:

Measurements of expansion made different solids show that different solids expand by different amounts for the same increase in temperature. This expansion actually depends upon the initial kinetic energy of the particles of the solids. Since solids have strong inter-particle forces so they don't expand to large extent.

Expansion in liquids:

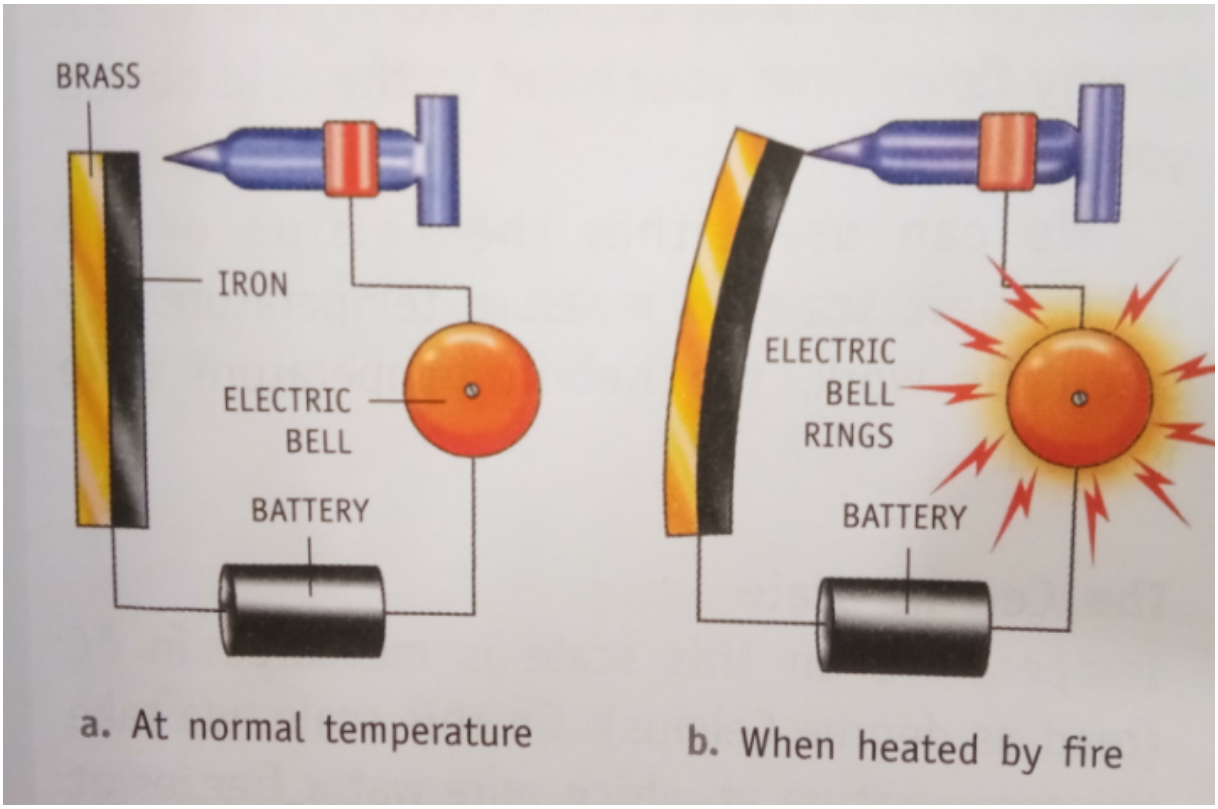
We know that the molecules of a liquid are not so firmly bound to each other as in a solid. Therefore, on heating, their vibrations increase more than the vibrations of molecules of solids. The result is that liquids expand more than solids on heating.

Expansion in gases:

On heating a gas the vibrations of its molecules increases. Since the molecules are not bound each other at all, the average distance between the molecules increases considerably. Hence, the expansion will be more in case of gases than in liquids or solids. Thus, gases expand more than liquids and solids on been heated.

Expansion around us:

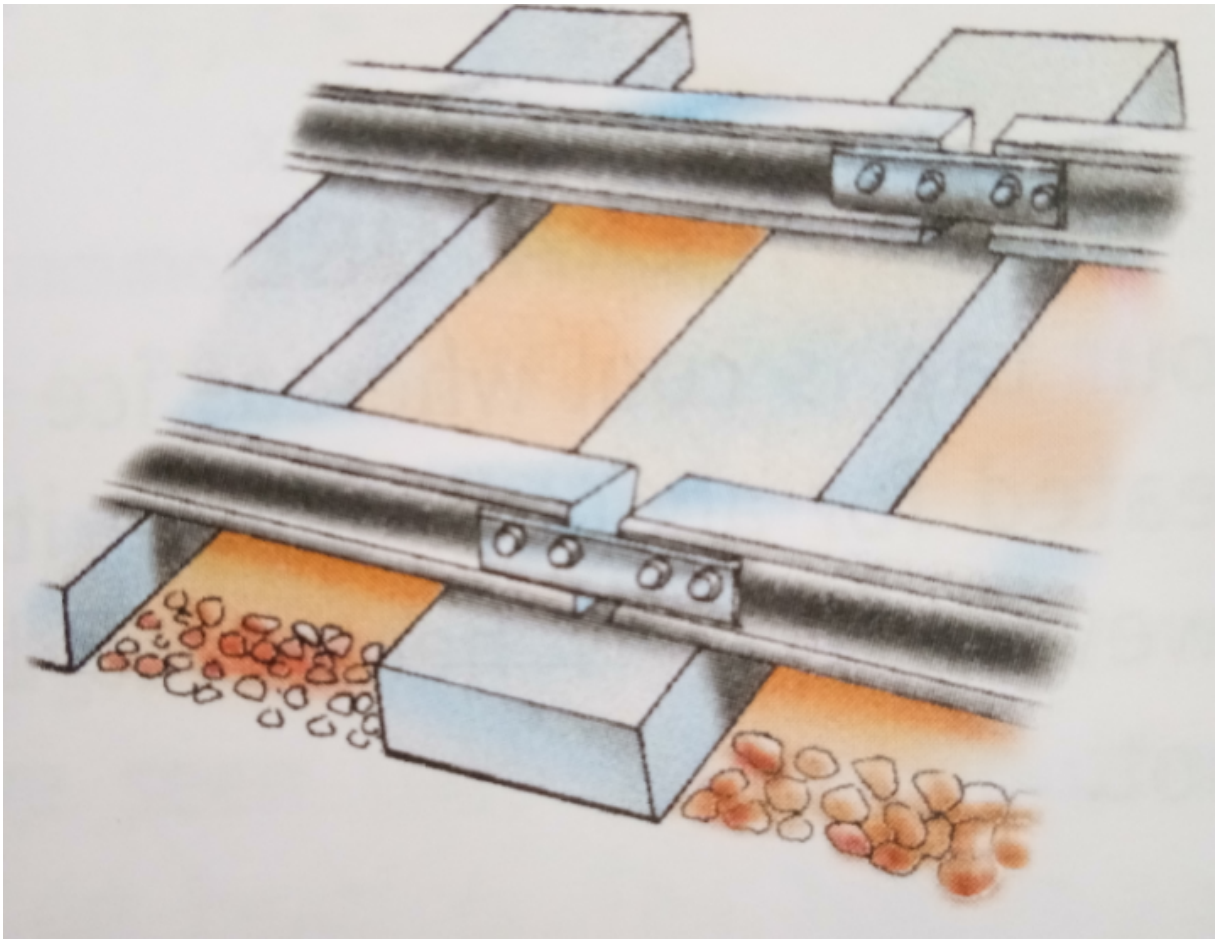
- *The expansion of solids can be put to use. The automatic fire alarm system uses the fact that different solids expand by different amounts on heating. The alarm contains two metal strips, one of iron and the other of brass, firmly bolted together. Brass expands more than iron on heating. Therefore, when this bimetallic strip gets heated because of fire, it bends on the side of iron. As it bends, the circuit of the electric bell is completed. The bell starts ringing to give the alarm. As the fire is put out, the strip gets cooled and straightens again. This causes the circuit to break, thus switching off the alarm.*



- *The metal caps on glass bottles can be loosened by pouring hot water over the metal cap. The metal cap expands on heating and loosens. However, at many places expansion causes problems.*

- *In summer, electric cables between two poles expand and sag. In winter, contract and become taut. If cables are laid in summer, they must be left a little loose to allow for contraction during winter. If this is not done, they may break on contraction in winter.*

- *The railway tracks over which trains run are made of iron. During summer, the iron expands. To allow this expansion, space has to be left between two sections of the rail tracks. If this is not done, expansion of the tracks can cause them to bend. This can cause serious accidents. Rollers for expansion in a steel bridge.*



- *When very hot liquid is poured in a glass tumbler, the tumbler sometimes cracks. This happens because the inner wall gets heated first and expands but the outer wall remains unchanged. The resulting strain cracks the glass. These*

days, however, special types of glass, which expand very little when heated, are available. Due to their low expansion, they do not crack even if very hot liquid is poured in them. One such glass is ***pyrex*** *glass.*

TEMPERATURE:

Water in your tap is cool whereas ice is cold. If water is heated for about a minute it becomes warm. However, if it is heated to boil it becomes hot.

If you touch a hot object and a cold object with your hand, you can feel the difference. However, you can only say that one object is hotter than the other. You cannot say by how much. We, therefore, need to know the degree of the hotness or the coldness of the body.

Thus the degree of hotness or coldness of a body is called its temperature.

there a difference in the sensation of heat in your left hand and right hand? Does the tap water feel warm to the left hand and cold to the ight hand?

Temperature is also defined as the quantity by which we can compare the hotness or coldness of bodies. The hotter a substance is, the higher is its temperature

SCALES OF TEMPERATURE

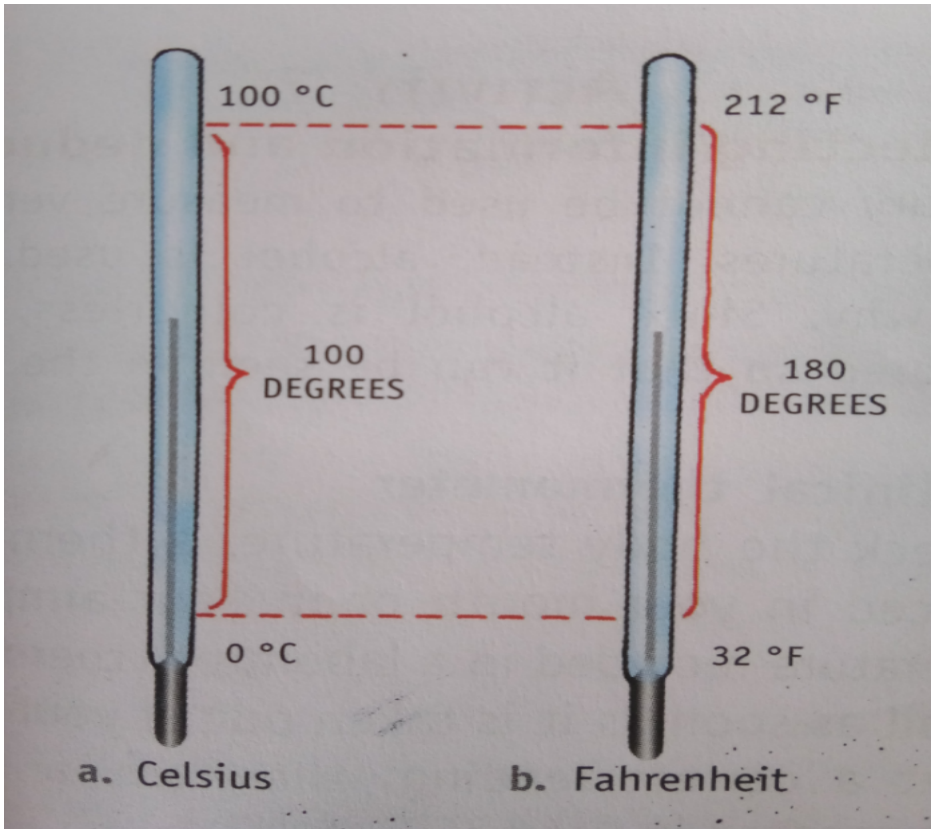
- ***The Celsius scale***

Temperature on this scale is measured in °C (read as degree Celsius). On this scale, we take the temperature at which pure water freezes at sea level to be 0 °C. This is called the ***lower fixed point****. The temperature at which pure water boils at sea level is called the* ***upper fix point*** *is taken as 100 °C*

We say at sea level, because the temperature at which water freezes or boils, changes as we go to higher altitude. You will learn the reason for this in higher classes.

- ***The Fahrenheit scale***

Temperature is also measured in °F (read as degree Fahrenheit). Its lower fixed point is taken as 32°F and the upper fixed point as 212 °F.



Conversion from one scale to another:

We know that

0 °C = 32 °F

100 °C = 212 °F

Therefore, the interval of 100 in °C is equal to an interval of 180 in °F. That is, the ratio of ^{0}C to ^{O}F is 100 : 180 or 5 : 9.

TO CONVERT	***FORMULA USED***
1. C to °F	***F = (9/5 x C) + 32***
2. °F to °C	***C = 5/9 (F - 32)***

EXAMPLE 1: Convert 10 °C to F.

Solution: ***F = (9/5xC) + 32***

= (9/5) x 10 + 32

= 50 °F

EXAMPLE 2: Convert 95 °F to °C.

Solution: $C = (5/9)(F - 32)$

$= (5/9)(95-32)$

$= (5/9) \times 63 = 35\ °C$

Measuring temperature:

The instrument used to measure temperature is called thermometer.

The laboratory thermometer:

The thermometers available in the laboratory consist of a long, thin, uniform glass tube sealed at one end, with a bulb filled with a liquid at the other end. The most commonly used liquid is mercury. A shining thread of mercury can be seen from outside the thermometer.

As the temperature rises, the mercury in the bulb expands and rises into the thin tube called the ***stem*** *of the thermometer. The stem is marked in ^0C or ^0F. The height of the liquid in the stem gives the reading of temperature. Laboratory thermometers with various ranges are available.*

The commonly used laboratory thermometers have range from -10 °C to 110 °C. The bigger marks normally read 1 °C. If there are 5 divisions between the bigger marks, each small division reads1/5 of a degree or 0.2^0C while measuring temperature with a laboratory thermometer, the following precautions should be observed.

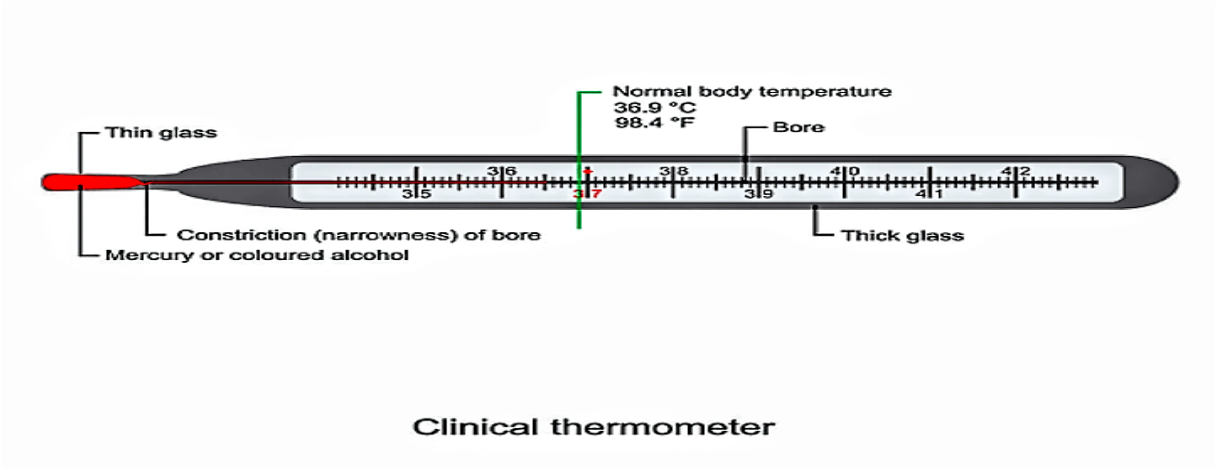
- *The thermometer should be washed before and after use.*
- *A thermometer is delicate and should be handled with care to avoid breakage.*
- *It should not be held by the bulb while reading the temperature.*
- *It should be kept upright and not tilted.*
- *The bulb should be completely surrounded by the substance whose temperature is being measured, and the bulb should not touch the sides of the Container.*
- *While reading the thermometer, the level of mercury should be at the same level as the eye.*

The clinical thermometer:

To check the body temperature, a thermometer is placed in your mouth or in your armpit. The temperature recorded in a laboratory thermometer will fall as soon as it is taken out of your mouth. To get a correct reading, therefore, a clinical thermometer is used.

This thermometer has a slight bend or kink in the stem just above the bulb. When the thermometer is taken out of your mouth, the liquid in the bulb contracts and the mercury column breaks at the kink. Therefore, the level of mercury in the stem remains the same. If the thermometer is to be used again, it is first given a jerk to bring the mercury in the stem back into the bulb.

The normal body temperature of a healthy person is 37 °C or 98.6 ^{0}F. It goes up if the person has fever. However, it does not go below 35 °C or above 42 °C. Therefore, a clinical thermometer has a range of 35 t to 42 °C. In the Fahrenheit clinical thermometer, which is commonly used, the temperature range is from 94 ^{0}F to 108 ^{0}F.



Clinical thermometer

TEXTUAL QUESTIONS:

1. *List four effects that heat prod four effects that heat produces are:*

Ans. *a. Increase in temperature.*
b. Expansion.
c. Change of state.
d. Chemical changes.

2. *What does a bimetallic strip consist of?*

Ans. *A bimetallic strip consists of two metal strips, one of iron and the other of brass.*

3. *A steel bridge expands in summer. What precautions are taken to make sure this expansion does not damage the bridge?*

Ans. *In a steel bridge, one end is kept on rollers having enough space for expansion in summer.*

4. How are temperature and hotness of a body related?

Ans. *Temperature and hotness of a body are related in a way that hotter the body is, the higher is its temperature.*

5. What do you mean by 'upper fixed point'?

Ans. *Upper fixed point is the temperature (on a scale) at which pure water boils at sea level.*

6. Why does a clinical thermometer have a kink in its stem?

Ans. *A clinical thermometer has a kink on its stem because when taken out of one's mouth, the liquid in the bulb contracts and the mercury column breaks at the kink. Thus the level of mercury in the stem remains the same and we get a correct reading.*

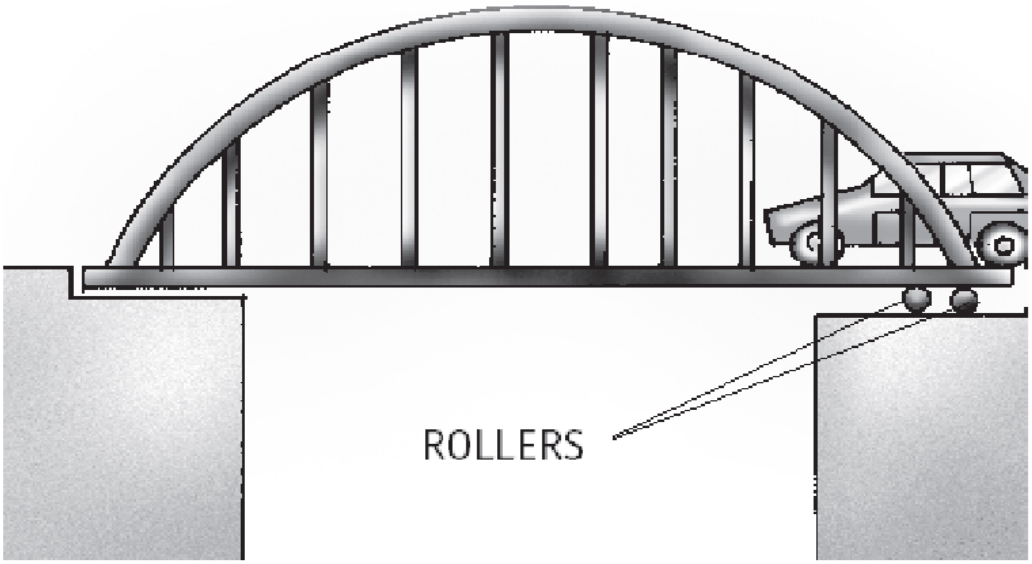
D. LONG-ANSWER QUESTIONS: (Answer in about 50 words).

1. Explain why a substance expands on heating?

Ans. *When we heat a substance, the movements of its molecules increase. This increases the average distance between the molecules. Therefore, the space occupied by the molecules, i.e. the volume of the substance increases. We say that heat causes expansion.*

2. Give one example where expansion on heating is put to good use. Explain the working with the help of a labeled diagram.

Ans. *In steel bridges, one end is made to rest on the rollers with enough space provided for the expansion during summers. This is one of the examples where expansion on heating is put to good use.*

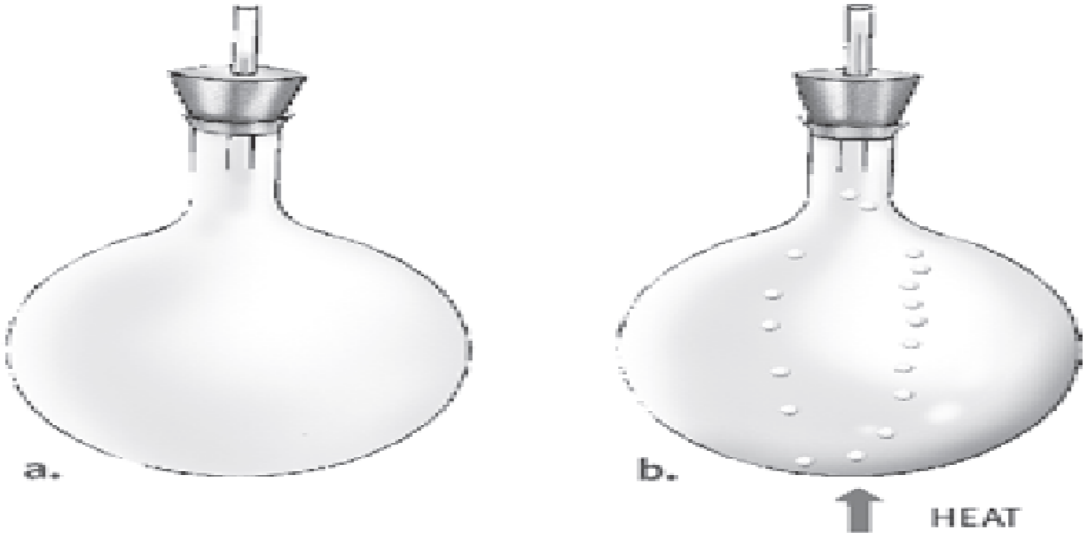


3. Explain why gases expand more than liquids and solids.

Ans. On heating a gas, the vibrations of its molecules increase. Since the molecules are not bound to each other at all, the average distance between the molecules increases considerably. Hence, the expansion will be more in case of gases than in liquids or solids

4. Explain with the help of a labeled diagram an experiment to show that liquids expand when heated.

Ans. Fill a flask up to the brim with water. Take a rubber cork with a hole in it and insert a narrow tube into the hole. Fix the cork firmly in the mouth of the flask. The liquid will rise a little in the tube. Note the level of the liquid. Now, heat the liquid. You will notice that the level of the liquid in the tube goes down a little and then starts rising. It goes down initially as the flask gets heated first and expands. When the heat reaches the liquid, it expands, and its level in the tube goes up



5. Expansion on heating can be a nuisance. Explain giving two examples.

Ans. Expansion on heating can cause some problems as explained below.

a. In summers, electric cables between two poles expand and sag. In winters, they contract and become taut. If cables are laid in summers, they must be left a little loose to allow for contraction during winters. If this is not done, they may break on contraction in winters.

b. The railway tracks over which trains run are made of iron. During summers, the iron expands. To allow this expansion, space has to be left between two sections of the rail tracks. If this is not done, expansion of the tracks can cause them to bend. This can cause serious accidents.

6. Calculate the temperature at which the reading on the Fahrenheit scale is double the reading on the Celsius scale.

Ans. Let us take $C = x$, thus $F = 2x$

According to the formula, we get

$$F = (9/5) \times C + 32$$

$$\text{Or } 2x = (9/5)\, x + 32$$

$$\text{or } 2x = 9/5\, x + 32$$

$$2x = \frac{9x + 32x5}{5}$$

$$\text{or } 10x - 9x = 32 \times 5$$

$$x = 160\,^{\circ}C$$

$$2x = 2 \times 160 = 320\,^{\circ}F$$

Thus, at 320 °F, the reading on the Fahrenheit scale will be double of the reading on the Celsius scale, i.e. 160 °C.

8. What precautions will you take while measuring temperature with a laboratory thermometer? What extra precaution will you take while measuring body temperature with a clinical thermometer?

Ans. While measuring temperature with a laboratory thermometer, the following precautions should be observed:

(i) The thermometer should be washed before and after use.

(ii) A thermometer is delicate and should be handled with care to avoid breakage.

(iii) It should not be held by the bulb while reading the temperature.

(iv) It should be kept upright and not tilted.

(v) The bulb should be completely surrounded by the substance whose temperature is being measured and the bulb should not touch the sides of the container.

(vi) While reading the thermometer, the level of mercury should be at the same level as the eye.

The extra precautions to be taken while measuring body temperature with a clinical

Thermometers are:

(i) Wash the clinical thermometer before use, preferably with an antiseptic solution.

(ii) Hold it with the stem and give it a few jerks, to ensure that the level of mercury falls to

SKILL BASED QUESTIONS:

1. You are planning to go to a very cold place where the night temperature drops to -50 °C. Which thermometer will you take with you-mercury or alcohol? Why?

2. Which is greater-a 1^0C rise in the Celsius scale or a $1\ ^0$F rise in the Fahrenheit scale?

3. Can a clinical thermometer be used to measure the temperature of boiling water? Why?

4. Why is a laboratory thermometer not used to measure body temperature?

5. You have seen that an ordinary glass tumbler can crack if very hot or very cold water is poured into it. You have two glass tumblers made of ordinary glass-one with thick walls and the other with very thin walls. Which one is more likely to crack when very hot or very cold water is poured into them?

DOON INTERNATIONAL SCHOOL,SRINAGAR.

SUBJECT: ENGLISH

Assignment:II

Grade:VII

- The objective of this assignment is to make the students acquainted with the following ideas:
- Importance of family.
- Preposition and its types.
- Adverb and its types.

Chapter no.3: The Story of an Invitation.

About the Author:

Lucy Maud Montgomery was a Canadian author best known for 'Anne of Green Gables' (1908). The book was an immediate success. She went on to publish 20 novels and 500 short stories and poems. She worked as a teacher and wrote stories which were published in various magazines and newspapers.

Plot Summary:

This chapter emphasizes on the friendship of two oddly different yet very close friends, Bertha and Grace. While Bertha is bright, popular and pretty, Grace is quite the opposite, being grave, quiet and modest in all sense. Initially being an orphan, she was raised by her aunt who too, had died recently. Even though the two were quite different from each other, they had been very close to each other since their last year when they were paired as roommates.

As the school year was coming to an end, and the holidays were to begin, Bertha had received a letter from her Aunt Meg from Riversdale who had invited her to spend the holidays with her. Having invited other girls too, there was room left for only one person, and she wanted that person to be Bertha. After receiving the news, Bertha was excited and delighted and shared the same with Grace. Hearing this, Grace expressed her pleasure about the news and then went on to describe her own plans for the vacations. While Bertha was to have fun all holidays at Aunt Meg's home, Grace was to work at Mr Clarkman's bookstore for the holidays to earn enough money to pay for her school as well as clothes. After Bertha heard this, she expressed how Grace was not strong enough to work there and that she should not do so, but Grace explained that there was no other way. Then she asked Bertha not to worry and that Bertha's letters would bring her some sort of comfort. Afterwards, she told Bertha she was going to study and Bertha replied the same.

However, no matter how hard she tried, Bertha could not get herself to concentrate and finally decided to write a letter to Aunt Meg, requesting her to invite and host Grace instead of her. Aunt Meg agreed. Then Bertha brought up the whole situation in front of Grace, lying to her that she could not go there and showed her the letter where Aunt Meg has invited her instead of Bertha. Initially Grace hesitated but eventually agreed and thus Bertha spent her holidays at home and Grace spent them at Aunt Meg's home.

At the end of the vacations Bertha received two letters, one from Aunt Meg and the other from Grace. In the letter Grace mentioned that she had a blast at Aunt Meg's home and that Aunt Meg had asked her to stay with her permanently. While as Aunt Meg's letter mentioned how she always wanted a daughter and had

found one in Grace. So Aunt Meg had decided to adopt Grace. At the end, Bertha exclaimed delightfully that she might be an angel in some story book.

1. Answer the following questions.

a. In what respect were the two girls different from the other?

Ans: Bertha and Grace had different nature. Bertha was bright, pretty, popular and was loved by her teachers and friends. On the other hand Grace was quiet, grave and modest in all aspects.

b. Why was Grace dressed as she was?

Ans: Grace had recently lost her Aunt who had been raising her till then, as she was an orphan. Thus Grace was dressed in mourning.

c. How did Grace celebrate the good news she had received?

Ans : Grace exclaimed to Bertha that she was delighted to hear that Bertha has such good relatives who cared and planned for her. Further, she told Bertha about her plans of working at Mr Clarkman's bookstore during the vacations.

d. What do we learn about the aunt from what Grace says about her?

Ans : Grace describes Aunt Meg as a motherly figure, who loves them.

e. What do you think is meant by the statement "Mary and Lou and Lil are girls after your own heart"?

Ans : The statement "Mary and Lou and Lil are girls after your own heart" meant that they shared the same interests as her.

Note: Part f, g and h to be done by the students themselves on their classwork notebooks.

GRAMMAR

Preposition:

A preposition is a word used to link nouns, pronouns, or phrases to other words within a sentence. They act to connect the people, objects, time and locations of a sentence.

Examples of Prepositions:

In the following sentences, examples of prepositions have been italicized. .

- Go ***down*** the stairs and ***through*** the door.
- He swam ***across*** the pool.

Types of Prepositions:

There are three types of prepositions, including time prepositions, place prepositions, and direction prepositions.

a. Prepositions of Time

The preposition which tells about a noun in terms of time is called preposition of time.

For example:

- I was born ***on*** July 4th, 2005
- We eat breakfast ***in*** the morning.
- I work faster ***at*** night.

b. Preposition of Place

The preposition which is used to denote the place or position of something or someone is called preposition of place.

For example:

- The cat is ***on*** the table.
- The dogs are ***in*** the kennel.
- We can meet ***at*** the crossroads.

a. Prepositions of Movement

The prepositions which are used to show movement from one place to another. These prepositions are most often used with verb of motion and are found after the verb.

For examples:

- She turned her back ***to*** the audience.
- Her hair whipped ***around*** her face in the wind.

Exercises:

Fill in the blank with the most appropriate preposition.

1. The bone was _____ (about, for, considering, after) the dog.

2. We are going on a vacation _____ (on, at, in, since) August.

3. Please put the vase _____ (in, on, for, over)the table.

4. I received a present _____ (from, of, by, about) Janet.

5. School begins _____ (in, on, from, since) Monday.

Adverb:

What is an Adverb?

An adverb is a word that is used to change, modify or qualify several types of words including an adjective, a verb, a clause, another adverb, or any other type of word or phrase, with the exception of determiners and adjectives, that directly modify nouns.

Types of Adverbs:

a. Adverbs of Manner

An adverb of manner tries to explain how an action is carried out. Very often adverbs of manner are adjectives with -ly added at the end, but this is certainly not always the case.

For example:

- She passed the exam ***easily***.
- They were walking ***quickly*** to catch the train.
- John answered the question ***correctly.***

b. Adverbs of place

An adverb of place, sometimes called spatial adverbs, helps to explain where an action has taken place.

For example:

- New York is located ***north*** of Philadelphia.
- They travelled ***down*** the mountainside.
- First, I looked ***here***, and then I looked ***there***, but I can't find them ***anywhere.***

c. Adverbs of Frequency

Adverbs of frequency are used to express time or how often something happens.

For example:

- The adverb is ***usually*** placed before the main verb.
- We get paid ***hourly***.
- I will ***always*** pray for the health of my parents.

d. Adverbs of Time

Adverbs of time, while seemingly similar to adverbs of frequency, tell us when something happens. Adverbs of time are usually placed at the end of a sentence.

For example:

- Harvey forgot his lunch ***yesterday*** and again ***today.***
- I have to go ***now***.
- We first met Julie ***last year.***

***e.* Adverbs of Purpose**

Adverbs of purpose, sometimes called adverbs of reason, help to describe why something happened. They can come in the form of individual words – so, since, thus, because – but also clauses – so that, in order to.

For example:

- I was sick, ***thus*** didn't go to work today.
- I started jogging ***so that*** I wouldn't be late.

- ***Because*** I was late, I jogged a little faster.

Exercises:

Fill in the blank with the appropriate adverbs.

1. The driver stopped the bus _____ (finally, exactly, abruptly, now).

2. During autumn, colourful leaves can be seen falling _____ (everywhere, very, gently, loudly) from trees.

3. My grandmother always smiled _____(cheerfully, sadly, never, yesterday).

4. After the party, confetti was strewn _____(blandly, everywhere, later, carefully).

5. It's time to go _____(before, now, after).

Note: Do all the questions and answers on your respective classwork notebook.

DOON INTERNATIONAL SCHOOL, SRINAGAR

SUBJECT: S.ST

Assignment: II

Grade: VII

Chapter: The Sultanate Period.

Instructions:

- The objective of this assignment is to make the students acquainted with the various dynasties of Delhi Sultanate;

Delhi Sultanate

Slave Dynasty	Khalji Dynasty	Tughluq Dynasty	Sayyid Dynasty	Lodi Dynasty
Qutb-ud-din Aibak	Jalal-ud-din Firoz Khalji	Ghiyas-ud-din Tughluq	Khizr Khan	Bahlul Lodi
↓	↓	↓	↓	↓
Shams-ud-din Iltutmish	Ala-ud-din Khalji	Muhammad-bin Tughluq	Mubarak Shah	Sikandar Lodi
↓	↓	↓	↓	↓
Rukh-nud-din Firoz Shah	Khusrau Malik	Firoz Shah Tughluq	Ala-ud-din Alam Shah Sayyid	Ibrahim Lodi
↓				
Raziya Sultan				
↓				
Nasir-ud-din Mahmud → Ghiyas-ud-din Balban				

INTRODUCTION

The period from 1206 to 1526 is known as the age of the **Delhi Sultanate**. Delhi was the capital of the sultans who conquered a large part of the Indian subcontinent. Five dynasties ruled during this period.

Sources: Accounts of travelers and court chronicles are the most valuable sources of information for this period. **Ibn Batuta** and **Marco Polo** visited India and wrote about conditions during that time. Zia-ud-din Barani, Shams-I-Siraj Afif and Minhaj-us- Siraj have given the detailed account pf court proceedings and details about the personal and public life of the Sultans. Coins, inscriptions and monuments are the other important sources that tell us about this period.

The Slave Dynasty

The rulers of this dynasty were called slaves or Mamluk Sultans. Actually, Mamluk in Arabic means 'owned'. Iltutmish and Balban were slaves of Qutb-ud-din Aibak, who himself was a slave of Muhammad Ghori.

Qutb-ud-din Aibak (1206-1210): The first ruler of the dynasty was Qutb-ud-din Aibak. Muhammad Ghori had left him in charge of the territories he had conquered in India. After His death Qutb-ud-din began to rule as an independent ruler. He was called '**lakh baksh**' because he gave away a lot of wealth as charity.

Raziya Sultan (1236-1240): Raziya's reign was short and full of problems. The nobles opposed her because they hated taking orders from a woman. They didn't like Raziya for taking decisions without consulting them. They plotted and deposed her in 1240. Soon afterwards, she died.

Period from 1240-1266: After the death of Raziya and till the accession of **Balban,** many king came to the throne. Of them, **Nasir-ud-din Mahmud,** another son of Iltutmish, ruled from 1246 to 1266. He was a puppet in the hands of powerful nobles.

Ghiyas-ud-din Balban (1266-1286): Balban was the most powerful ruler of Slave Dynasty. He had been an important noble since the reign of Iltutmish and was the real power behind Nasir-ud-din Mahmud. He re-organized and strengthened the army, He fought against the local rulers and defeated many of them. He also guarded the north-western borders against Mongol raids.

The Khalji Dynasty

The Khalji Sultans ruled for three decades. They expanded and consolidated the sultanate further.

Jalal-ud-din Firoz Khalji (1290-1296): Jalal-ud-din was a weak ruler. He adopted a lenient policy towards the Mongols and married one of his daughters to **Ulugh khan,** the Mongol leader. He was succeeded by his nephew **Ali Gurshap**, who took the title of Ala-ud-din.

Ala-ud-din Khalji (1296-1316): The most powerful ruler of this dynasty was Ala-ud-din Khalji. He was an ambitious ruler. Soon after coming to power, he set about his goal of establishing an all-India empire.

The Tughluq Dynasty

The Tughluq Dynasty ruled for close to a hundred years. It produced two powerful Sultans-Muhammad-bin Tughluq and Firoz Shah Tughluq.

Ghiyas-ud-din Tughluq (1320-1325): The first ruler of this Dynasty was Ghiyas-ud-din. He put down rebellions and strengthened the sultanate. He was succeeded by his son **Jauna Khan,** who took the title of Muhammad bin Tughluq.

Muhammad bin Tughluq (1325-1351): He was a very powerful ruler. Ibn Batuta gives a lot of information about his reign. He tells us that the Sultan had great ideas and plans that failed the common people could not understand them.

Taxation in the Doab: To increase revenue collection the Sultan raised the land tax in the Doab region. However, the king's timing was not good. The Doab was facing a severe famine during this period. To raise taxes at such a time was a mistake. Many peasants abandoned their land. Some of them revolted. Ultimately, the Sultan had to withdraw his orders.

THE NOBILITY

The Nobles were a very powerful group. Most of them were Turkish or Afghan. The rulers often gave high posts to their slaves. Some were governor's others military commanders. Ibn Batuta and Barani mentioned many people of humble birth who became Nobles during the reign of Muhammad bin Tughluq. These included Ratan and Firoz, Both barbers: Najib, a musician; Mankah, a cook; and Ladla and Pira, both gardeners.

SAYYID DYNASTY

Mubarak shah Sayyid (1421-1434): Mubarak shah succeeded his father. He was a man of vision and could have revived the old glory of the Sultanate. The Nobles, however, were against him. Most of his time was spent in controlling them.

Muhammad shah Sayyid (1434-1443): He was Mubarak Shah's nephew. The nobles became very powerful during his reign

Ala-ud-din Alam Shah Sayyid (1443_1451): Alam Shah was the next ruler. In 1451 he lost Delhi to Bahlul Lodi. With this the brief rule of the Sayyid Sultans came to an end.

The Lodi Dynasty

Until this period all the rulers of the sultanate were of Turkish origin. The Lodis, however, were Afghans.

Bahlul Lodi (1451-1489): The first Lodi ruler was Bahlul Lodi. He tried to consolidate the fragmented sultanate. He remover rebellious governors and appointed loyal Afghan nobles in their place. At the time of his death the sultanate was extended from Punjab to Bihar.

Sikandar Lodi (1489-1517): The most powerful Lodi ruler was Bahlul's son, Sikandar Lodi. He annexed Jaunpur and Bihar and signed a treaty of friendship with the ruler of Bengal. He also introduced many public welfare measures. For example, like Ala-ud-din Khalji, he tried to lower the prices of all essential items. He also gave loans to farmers. He founded the city of Agra and made it his capital.

Ibrahim Lodi (1517-1526): Ibrahim Lodi succeeded Sikandar Lodi. The Afghan nobles rebelled against him. He however defeated them. To prevent such revolts, he replaced senior nobles and governors, who had a lot of power by younger men. The displaced nobles conspired with Barbur who over threw Ibrahim Lodi in the First battle of Panipat in 1526. Barbur was the first ruler of Mughal Dynasty.

Write the Answer of these Questions on your fair notebook.

Q1: Who was Raziya Sultan? Why did the Nobles oppose Raziya?

Q2: Name the two Persian customs introduced by Balban. Why were people against these customs?

Q3: What were 'dagh' and 'chehra'? Who introduced them?

Q4: Write one reason that prompted Muhamad bin Tughluq to shift the capital to Daulatabad?

Q5: Give two reasons to show that the court of the Delhi Sultans was a 'ceremonial' court?

دون انٹرنیشنل اسکول، سرینگر

☆جماعت: ہفتم

☆سبق: اپنی ریاست (۱)

☆مفوضہ کام: حصہ دوم

تعارف:

ہماری ریاست جموں وکشمیر، جو کہ دوراجدھانیوں اور بائیس اضلاع پر مشتمل ہے۔ اس کا کُل رقبہ ۲۲۲۲۳۶ کلومیٹر ہے ۔۲۰۱۱ کی مردم شماری کے مطابق اس کی آبادی ۱۲۵۴۸۹۲۶ جو کہ ہندوستان کی ریاستوں میں انیسویں نمبر پہ ہے۔ جہاں تک جنگلات کا تعلق ہے ایک زمانے میں یہاں کے جنگل پنتیس ہزار کلومیٹر پہ تھے لیکن اب یہ بیس ہزار کلومیٹر رہ گئے ہیں۔ اس وادی میں کئی دریا بھی ہے جو کہ اس کی خوبی کے ساتھ ساتھ بہت ہی اہمیت کے حامل ہیں۔ یہ وادی کئی جنگلی جانوروں کی مسکن بھی ہے۔ ہمارا قومی جانور ہانگل ہے۔

سوالات:

س ۱:۔ گلیشر کیا ہوتے ہیں۔ ریاست کے کم از کم تین گلیشروں کے نام لکھیے؟

ج: برف سے بنا ہوا پہاڑ گلیشر کہلاتا ہے۔ کُن کن، سیاچن، درنگ

س ۲:۔ اللہ نے ہمیں کس بڑی نعمت سے نوازا ہے۔ ہم اس سے کس طرح فائدہ اٹھا سکتے ہیں؟

ج: اللہ نے ہمیں دریاؤں کے پانی سے مالا مال کیا ہے۔ اور ہم ان پر بجلی گھر بنا سکتے ہیں۔

نوٹ: سوال نمبر ۳ ، ۴ ، ۵ خود کریں

س ۱:۔ ہماری ریاست کا رقبہ کتنا ہے؟

ج: ۲۲۲۲۳۶

س ۲:۔ ہماری ریاست کے کل کتنے صوبے اور اضلاع ہے؟

ج:۔ ہماری ریاست کے دو صوبے اور بائیس اضلاع ہیں۔

نوٹ:۔ سوال نمبر ۳ ، ۴ ، ۵ خود کریں

واحد	جمع	واحد	جمع
باغ	باغات	حیوان	حیوانات
وجہ	وجوہات	قبیلہ	قبائل

نوٹ: باقی خود کریں

DOON INTERNATIONAL SCHOOL SRINAGAR

SUBJECT: SCIENCE

Solved Assignment: II

Grade: VII

CHAPTER: FLOW OF HEAT.

- The objective of this assignment is to make students acquainted with the concept of transfer of heat and understand the modes of heat transfer.

KEY POINTS:

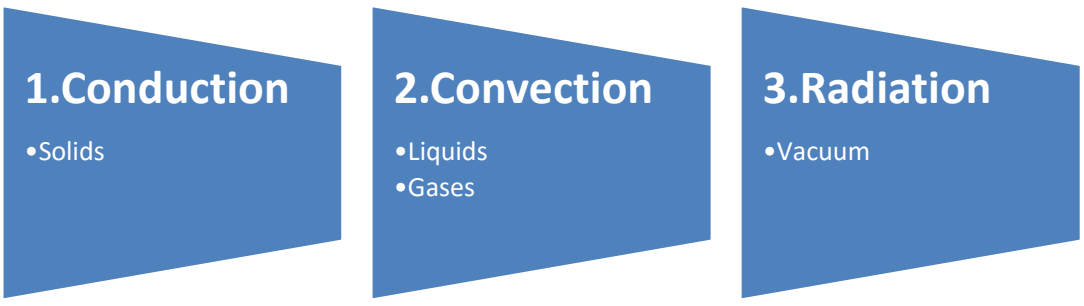
- The heat flows from a body at higher temperature to a body at lower temperature.
- Heat can flow from one object to another by three ways conduction, convection and radiation.
- In solid generally heat transfers by conduction, in liquid and gases heat transfers by convection and for transfer of heat by radiation no medium is required.
- The materials which allow heat to pass through them easily are conductors of heat.
- The materials which do not allow heat to pass through them easily are insulators.
- Dark coloured objects absorbs radiation more than a light coloured objects.
- Woollen clothes keep us warm because wool is poor conductor of heat and it has air trapped in between the fibers.

Transfer of heat:

Heat flows from a hot object to a cold object or from a body at high temperature to a body at lower temperature. This flow of heat is known as transfer of heat, e.g. if we dip steel spoon in a cup of hot tea, we will observe that temperature of spoon rises and becomes hot.

When the objects attain the same temperature, flow of heat stops. This means *no heat will be transferred from one object to another if the temperature of two objects is same*.

Modes of heat transfer:



1. Conduction:

Conduction is the process of heat transfer in which heat travels from a molecule to molecule, from the hot end to the cold end. However molecules do not travel from one place to another. The conditions necessary for transfer of heat from one body to another by conduction are:

a. The two objects must be in contact.

b. Their temperatures should not be the same.

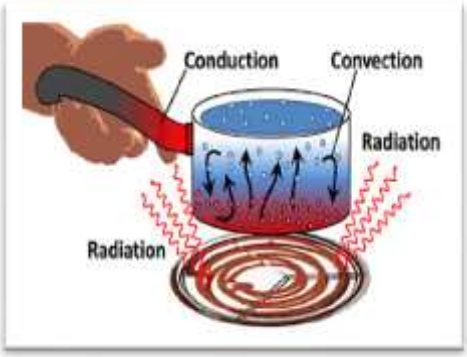
Example: When one end of an iron rod is put over flame then part which is nearer to the flame is heated first and heat is gradually transferred to the other end of the rod. This happens because particles of iron rod which are nearer to the flame receive the heat and transfer this to the adjacent particles. Subsequently, the adjacent particles transfer the heat to the next adjacent particles. This process continues and heat reaches to the other end of the rod. Thus, heat transfer in solid takes place through conduction.

Conductor:

Materials which allow heat to pass through it are called conductor or good conductor of heat, such as iron, copper, aluminum, etc. All metals are good conductors of heat. Since metals are the good conductor of heat that's why kitchen utensils are made of metals or alloys of metals.

Insulator:

Materials which do not allow heat to pass through them are called bad conductor or poor conductor of heat. They are also called insulators. Example: rubber, wood, plastic, etc. This is the cause that handles of frying pan or other kitchen utensils are made of plastic.



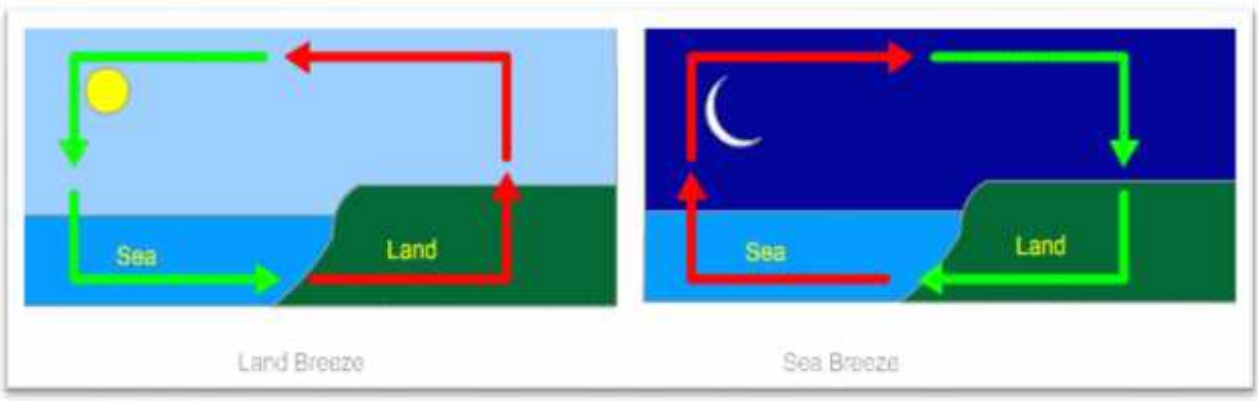
2. Convection:

The transfer of heat because of movement of the molecules of the medium; via mass transfer; is called convection or convection of heat. Water and air are bad conductors of heat. But they do become hot, in spite of being bad conductors. Heat transfer in fluids takes place through convection.

Convection in water: When water is heated in a pan, the particles of water which are near the source of heat; get heated first. Because of heating, they become light; and rise in water. The gap which is created because of rise of hot particles is filled by cold particles of water from the surrounding area. Thus a cyclical movement of particles begins and ends up heating the whole water of the pan. The cyclical movement in fluids because of heating is called convection current.

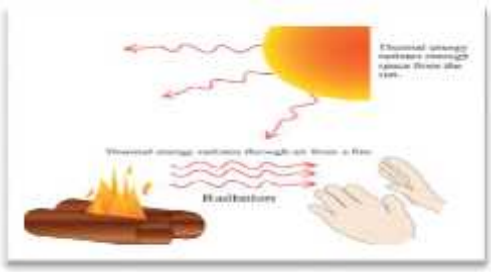
Convection in air: Air gets heated because of convection; the way water gets heated. Air near the source of heat gets heated and rises above. This leaves a gap; which is filled by the colder air from the surrounding. The convection current thus starts in air which results in heating up of air.
When you place your palm above a flame you will feel the hotness of the flame. But when you will place your palm below the flame the area will be colder. This shows how the colder air from below moves up; due to convection current.

Land and Sea Breeze:



Sea Breeze: In coastal areas, the breeze that moves from sea surface to the land is called sea breeze. This happens because, during daytime, land gets heated more quickly than water. As a result, warm air from land rises up; leaving a gap. To fill that gap, colder air from the ocean surface rushes towards the land. This phenomenon continues and a continuous flow of cold air keeps coming towards the land. This gives rise to the phenomenon which is called the sea breeze. Because of this, people living in coastal areas prefer to live in a sea facing house.

***Land breeze*:** In coastal areas, the breeze which moves from land towards the sea is called land breeze. In the night, the land cools down more quickly than the ocean surface. This makes the air over the water surface warmer than air over the land surface. Warmer air over the water surface rises in the air and air from the land rushes towards the water surface to fill the gap. This phenomenon continues which creates a flow of air from land to the sea. This phenomenon is called land breeze.



3. Radiation:

All hot bodies emit heat by the process of radiation. Radiation of heat does not require a medium. Sunlight comes to the earth because of radiation as there is no medium present between the atmosphere of the earth and the sun. This heat travels with the same speed as light. Thus it is because of radiation of heat one can feel the heat of bonfire by standing around it.

Reflection and absorption of heat: When heat falls over an object some of the heat is absorbed by the body and some of the heat is reflected. The temperature of an object increases because of absorption of heat.

- In conventional room heater you can see the reflector attached with it. The reflector of the room heater reflects the heat towards the person sitting or standing near the room heater.
- Reflection is the cause that umbrella is used to protect from heat of the sun in summer. Dark color absorbs more heat while light color reflects most of the heat. That's why wearing light colored clothes is preferred in summer, dark colored clothes are preferred in winter.
- Dark clothes absorb more heat and keep one comfortable in winter. On the other hand, light clothes reflect most of the heat and keep one comfortable in summer.
- Now-a-days many kitchen utensils come in black color, since utensils of black color absorb more heat and thus cooking becomes faster.
    - Woolen Cloth: Woolen clothes are used in winter season. Wool is a poor conductor of heat. In addition to it; air gets trapped in woolen fiber to further increase the poor conductivity of wool. This prevents the radiation of heat of our body to the surrounding and prevents the cold from surrounding to affect our body. Thus, wearing woolen cloth makes one comfortable in winter season.

The construction and working of a thermos flask

A thermos flask maintains the temperature of the substance kept in it, that is, it keeps a hot substance hot and cold substance cold for long period of time. The outer casing of a thermos flask is made up of plastic or metal. Plastic, being a poor conductor of heat, acts as an insulator preventing the heat loss through conduction. Inside it is a double-walled container made of glass or stainless steel. Both the walls are polished so they are shiny. The space between the two walls is a vacuum; this prevents heat loss through convection since there are no air particles to carry out the transfer of heat. The shiny surface of the walls also prevents heat loss through radiation.

SOLVED QUESTION- ANSWERS: (to be done on fair note-book)

C. Short-answer questions:

1. The conditions necessary for transfer of heat from one body to another by conduction are:

   a. The two objects must be in contact;

   b. Their temperatures should not be the same.

2. Substances which allow heat to be conducted through them easily are called good conductors of heat. For example, iron and silver are good conductors of heat. Substances which do not allow heat to be conducted through them easily are called bad conductors of heat. For example, wood and plastic are bad conductors of heat.

3. Wool fibers have pores in them which are filled up with air which is a bad conductor of heat. Thus, wool (an insulator) and air together prevent the heat from our bodies from escaping out. So, Woolen clothes keep us warmer in winters than cotton clothes.

4. Ventilators in houses are provided high upon the walls because the air we breathe out is warmer and lighter, and rises up. Warm air escapes from the ventilators. It is replaced by cool and heavier fresh air coming in from doors and windows below due to the convection.

5. The heat from the sun reaches us through millions of miles of empty space by radiation only. This heat travels with the same speed as light.

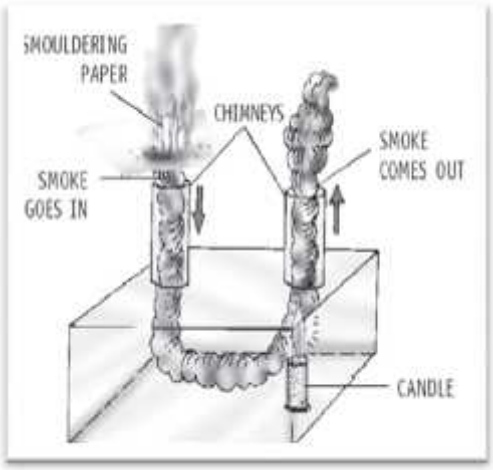
6. The polished curved surface at the back of the heating rod in a room heater reflects almost all the radiant heat from the heating element that falls on it. This makes the room heater more effective.

D. Long- question answers

1. Take an iron rod. Fix thumb-tacks along the length of the rod, using wax. Heat one end of the rod. As the rod gets heated, the wax melts and the thumb-tacks fall off. We will find that the thumb-tack nearest to the end being heated falls off first. The farthest thumb-tack falls off last. This shows that heat is travelling along the length of the rod from the hot end to the cold end.

2. *Use of good conductors of heat:* We use good conductors of heat whenever we want heat to be transferred fast, e.g. cooking utensils are made of metals such as brass or aluminum which are good conductors of heat.

Use of bad conductors of heat: We use bad conductors of heat whenever we do not want heat to be transferred quickly, e.g. handles of cooking utensils are made of bad conductors of heat such as wood or plastic.



3. Take a closed rectangular glass box. With two holes in its top, fit two wide glass tubes to form chimneys. Put a small lighted candle below one of the chimneys. Hold a smouldering piece of paper at the top of the other chimney. We will see smoke entering the box through that chimney. It then gets heated up by the candle and comes out of the other chimney. As the air above the candle gets heated, it becomes lighter and rises up. It is replaced by fresh air sucked in from the other chimney. The smoke is sucked in along with air and sets the convection current shown in the box.

4. *Sea breeze:* During the day, land heats up more than water. The air over the land becomes hotter and lighter and rises up. The air from the sea, which is cooler and heavier, rushes to take the place created by the hot rising air. Therefore, a sea breeze blows during the day.

Land breeze: During the night, land loses heat faster than water and becomes cooler. The air over the sea is now warmer. It rises up and the cooler air over the land rushes to take its place. Thus, we observe a land breeze at night.

5. Black objects absorb more heat than white or polished ones. Two daily uses of this are:

- The outer base of a cooking utensil is painted black so that it absorbs more heat so that cooking can be done in less time.
- Dark-coloured clothes are suitable in winters as they absorb more heat.

6. Black objects radiate more heat than white objects. Two everyday uses of this principle are:

- The back of refrigerators is coloured dull black to radiate heat more effectively in order to cool down the refrigerator pipes.
- Electric hot plates are also coloured dull black to radiate maximum heat.

7. The vacuum between the two glass walls of the thermos flask considerably reduces the flow of heat by conduction and convection. This is because both conduction and convection need molecules of a medium for transfer of heat. The silvered surfaces reflect the heat back, thus,

reducing radiation

8. The water in the test tube which is heated from below will heat up faster. Water is a bad conductor of heat. So, in case of the test tube heated from top, it will not easily conduct heat from the top to the bottom. But, water transfers heat through convection. In case of the test tube heated from the bottom, water molecules getting heated become lighter and rise up. These molecules pass on their heat energy to the surrounding cold molecules and this heat is carried to all parts of water.

Additional questions:

1. Distinguish between:
   a. Conduction and Convection.
   b. Conductors and Insulators.
2. Why you cannot keep your hand above a burning candle, but can keep on the sides of the flame?
3. Name the mode of heat transfer in each of the following case:
   a. A spoon kept in a hot cup becomes warm.
   b. Heat energy reaching us from the sun.
   c. In a vessel of boiling water.

Skill based questions:

4. At a campus site, there are tents of two shades- one made with black fabric and another made with white fabric. Which one will you prefer for resting on a hot summer afternoon? Why?
5. Explain your mother why:
   a. Ventilators are situated close to the ceiling?
   b. Solar cookers are painted black from inside?
   c. When you keep an ice cube on your palm, it melts slowly?

DOON INTERNATIONAL SCHOOL, SRINAGAR

SUBJECT: MATHEMATICS

Assignment:II

Grade:VII

Chapter: Rational Numbers

Instructions:

The objective of this assignment is to make students acquainted with the following:

- Rational numbers.
- Properties of rational numbers.
- Various arithmetic operations on rational numbers.
- Representation of rational numbers on number line.

INTRODUCTION:

Before we start the introduction of rational numbers let us recall that for two given integers a and b, their sum a + b, product a × b and the difference a - b are always integers. However, it may not always be possible for a given integer to exactly divide another given integer means the result of division of an integer by a non- zero integers may or may not be an integer. For example, when 9 is divided by 4, the result is not an integer since we know 9/4 is a fraction. Thus, there is need to extend the system of integers so that it may also be possible to divide any given integer by any other given integer different from zero (because division by zero is not possible).

Now, we shall introduce the system of rational numbers, comparison of rational numbers, representation of rational numbers on the number line, various operations on rational numbers and the properties of these operations on rational numbers.

What is rational numbers?

The numbers of the form a/b, or a number which can be expressed in the form a/b, where 'a' and 'b' are integers and b ≠ 0, are called rational numbers. In other words, a rational number is any number that can be expressed as the quotient of two integers with the condition that the divisor is not zero.

For examples; each of the numbers 2/3, 5/8, -3/14, -11/-5, 7/-9, 7/-15 and -6/-11 is a rational number.

Numerator and denominator: If a/b is a rational number, then the integer a is known as its numerator and the integer b is called the denominator.

Is every rational number an integer?

Every integer is a rational number but a rational number need not be an integer.

We know that, 1 = 1/1, 2 = 2/1, 3 = 3/1, 4 = 4/1 and so on ……. .

Also, -1 = -1/1, -2 = -2/1, -3 = -3/1, -4 = -4/1 and so on …….. .

In other words, any integer a can be written as a = a/1, which is a rational number.

Thus, every integer is a rational number.

Clearly, 3/2,-5/3, etc. are rational numbers but they are not integers.

Hence, every integer is a rational number but a rational number need not be an integer.

Is zero a rational number?

Yes zero is a rational number. We know that the integer 0 can be written in any one of the following forms. For example, 0/1, 0/-1, 0/2, 0/-2, 0/3, 0/-3, 0/4, 0/-4 and so on …..

In other words, 0 = 0/b, where b is any non-zero integer

Thus, 0 can be written as, a/b = 0, where a = 0 and b is any non-zero integer.

Hence, 0 is a rational number.

Positive rational numbers

A rational number is said to be positive if its numerator and denominator are either both positive integers or both negative integers. In other words, a rational number is positive, if its numerator and denominator are of the same sign.

Each of the rational numbers 1/4, 2/9, -7/-11, -3/-13, 5/12 are positive rationals, but 2/-5, -3/10, -4/7, 11/-23 are not positive rationals.

Is every natural number a positive rational number?

We know that, 1 = 1/1, 2 = 2/1, 3 = 3/1, 4 = 4/1 and so on ……..

In other words, any natural number n can be written as n = n/1, where n and 1 are positive integers.

Hence, every natural number is a positive (+ive) rational number.

Note: The rational number 0 is neither positive nor negative.

Negative rational number.

A rational number is said to be negative if its numerator and denominator are of opposite signs such that, one of them is positive integer and another one is a negative integer. In other words, a rational number is negative, if its numerator and denominator are of the opposite signs.

Each of the rational numbers -1/6, 2/-7, -30/11, 13/-19, -15/23 are negative rationals, but -11/-18, 2/5, -3/-5, 1/3 are not negative rationals.

Is every negative integer a negative rational number?

We know that -1 = -1/1, -2 = -2/1, -3 = -3/1, -4 = -4/1 and so on …….

In other words, any negative integer n can be written as n = n/1, here n is negative and 1 is positive.

Hence, every negative integer is a negative (-ive) rational number.

Note: The rational number 0 is neither positive nor negative.

Equivalent rational number

A rational number obtained by multiplying or dividing both the numerator and the denominator of a rational number by the same non-zero integer, is said to be the equivalent form of the given rational number. e.g. , $\frac{1}{2} = \frac{1\times3}{2\times3} = \frac{3}{6}$ thus 3/6 is equivalent rational number to 1/2.

Standard form of a rational number

A rational number a/b is said to be in the standard form if b is positive, and the integers "a" and "b" have no common factor other than 1. For example 3/5, 5/7 etc.

How to convert a rational number into standard form?

In order to express a given rational number in the standard form, we follow the following steps:

Step I: Obtain the rational number.

Step II: See whether the denominator of the rational number is positive or not. If it is negative, multiply or divide numerator and denominator both by -1 so that denominator becomes positive.

Step III: Find the highest common factor (HCF) of the absolute values of the numerator and the denominator.

Step IV: Divide the numerator and denominator of the given rational number by the HCF obtained in step III. The rational number so obtained is the standard form of the given rational number.

Some useful properties of rational numbers.

Property 1: If a/b is a rational number and m is a non-zero integer, then

$$\frac{a}{b} = \frac{a \times m}{b \times m}$$

In other words, a rational number remains unchanged, if we multiply its numerator and denominator by the same non-zero integer.

Property 2: If a/b is a rational number and m is a common factor of a and b, then

$$\frac{a}{b} = \frac{a \div m}{b \div m}$$

In other words, if we divide the numerator and denominator of a rational number by a common divisor of both, the rational number remains unchanged.

For example:

−32/40 = −32÷8/40÷8 = −4/5

Property 3: Let a/b and c/d be two rational numbers.

Then a/b = c/d ⇔ a × d = b × c.

For example:

If 2/3 and 4/6 are the two rational numbers then, 2/3 = 4/6 ⇔ (2 × 6) = (3 × 4).

Property 4:

For each rational number m, exactly one of the following is true:

(i) m > 0 (ii) m = 0 (iii) m < 0

For examples:

The rational number 2/3 is greater than 0.

The rational number 0/3 is equal to 0.

The rational number −2/3 is less than 0.

Property 5: For any two rational numbers a and b, exactly one of the following is true:

(i) a > b (ii) a = b (iii) a < b

For example:

If 1/3 and 1/5 are the two rational numbers then, 1/3 is greater than 1/5.

If 2/3 and 6/9 are the two rational numbers then, 2/3 is equal to 6/9.

If −2/7 and 3/8 are the two rational numbers then, −2/7 is less than 3/8.

Property 6: If a, b and c be rational numbers such that a > b and b > c, then a > c.

For example:

If 350, 173 and −81 are the three rational numbers where 350 is greater than 173 and 173 is greater than −81, then 350 is also greater than −81.

We will now learn the comparison of rational numbers.

We know how to compare two integers and also two fractions. We know that every positive integer is greater than zero and every negative integer is less than zero. Also every positive integer is greater than every negative integer. Similar to the comparison of integers, we have the following facts about how to compare the rational numbers.

(i) Every positive rational number is greater than 0.

(ii) Every negative rational number is less than 0.

(iii) Every positive rational number is greater than every negative rational number.

(iv) Every rational number represented by a point on the number line is greater than every rational number represented by points on its left.

(v) Every rational number represented by a point on the number line is less than every rational number represented by points on its right.

How to compare the two rational numbers?

In order to compare any two rational numbers, we can use the following steps:

Step I: Obtain the given rational numbers.

Step II: Write the given rational numbers so that their denominators are positive.

Step III: Find the LCM of the positive denominators of the rational numbers obtained in step II.

Step IV: Express each rational number (obtained in step II) with the LCM (obtained in step III) as common denominator.

Step V: Compare the numerators of rational numbers obtained in step IV, rational number having greater numerator is the greater rational number.

How to determine whether the two given rational numbers are equal or not using cross multiplication?

We know there are many methods to determine the equality of two rational numbers but here we will learn the method of equality of two rational numbers using cross multiplication.

In this method, to determine the equality of two rational numbers a/b and c/d, we use the following result:

$\frac{a}{b} = \frac{c}{d} \Leftrightarrow a \times d = b \times c$

=> Numerator of first × Denominator of second = Denominator of first × Numerator of second

Representation of rational numbers on the number line.

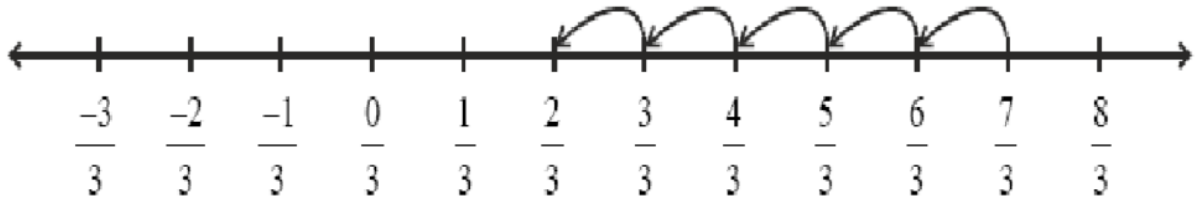
We know how to represent integers on the number line. To represent the integers on the number line, we need to draw a line and take a point O on it. Call it 0 (zero).

Set of equal distances on the right as well as on the left of O. Such a distance is known as a unit length. Let A, B, C, D, etc. be the points of division on the right of 'O' and A',B', C', D', etc. be the points of division on the left of 'O'. If we take OA = 1 unit, then clearly, the point A, B, C, D, etc. represent the integers 1, 2, 3, 4, etc. respectively and the point A', B', C', D', etc. represent the integers -1, -2, -3, -4, etc. respectively. Note that the point O represents integer 0.

Thus, we may represent any integer by a point on the number line. Clearly, every positive integer lies to the right of O and every negative integer lies to the left of O.

We can represent rational numbers on the number line in the same way as we have learnt to represent integers on the number line.

In order to represent rational numbers on the number line, for instance we have to represent n/3 on the number line where n is any integer. Divide the distance between 0 and 1, 1 and 2 and so on in three equal parts and those parts will represent rational numbers 1/3, 2/3, 3/3 and so on….locate then n/3.



We will now learn the addition of rational number with different denominator.

If the two rational numbers to be added have the same denominator, then write the common denominator and add the numerators as such to obtain the result.

To find the sum of two rational numbers which do not have the same denominator, we follow the following steps:

Step I: Let us obtain the rational numbers and see whether their denominators are positive or not. If the denominator of one (or both) of the numerators is negative, re-arrange it so that the denominators become positive.

Step II: Obtain the denominators of the rational numbers in step I.

Step III: Find the least common multiple of the denominators of the two given rational numbers.

Step IV: Express both the rational numbers so that the lowest common multiple of the denominators becomes their common denominator.

Step V: Write a rational number whose numerator is equal to the sum of the numerators of rational numbers obtained in step IV and denominator is the least common multiple obtained in step III.

Step VI: The rational number obtained in step V is the required sum (simplify if required).

Subtraction of rational number with different denominator.

To find the difference of two rational numbers which do not have the same denominator, we follow the following steps:

Step I: Let us obtain the rational numbers and see whether their denominators are positive or not. If the denominator of one (or both) of the numerators is negative, re-arrange it so that the denominators become positive.

Step II: Obtain the denominators of the rational numbers in step I.

Step III: Find the least common multiple of the denominators of the two given rational numbers.

Step IV: Express both the rational numbers in step I so that the least common multiple of the denominators becomes their common denominator.

Step V: Write a rational number whose numerator is equal to the difference of the numerators of rational numbers obtained in step IV and denominators is the least common multiple obtained in step III.

Step VI: The rational number obtained in step V is the required difference (simplify if required).

Multiplication of rational numbers.

Let us recall how to multiply two fractions. The product of two given fractions is a fraction whose numerator is the product of the numerators of the given fractions and whose denominator is the product of the denominators of the given fractions.

In other words, product of two given fractions = product of their numerators/product of their denominators. Similarly, we will follow the same rule for the product of rational numbers.

Therefore, product of two rational numbers = product of their numerators/product of their denominators.

Thus, if a/b and c/d are any two rational numbers, then

$\frac{a}{b} \times \frac{c}{d} = \frac{a \times b}{b \times d}$

How to find rational numbers between two rational numbers.

Let us recall integers and properties of various operations on them. We know between two non-consecutive integers x and y there are (x - y - 1) integers. However, there is no integer between two consecutive integers.

For example, between -7 and 7 there are 7 - (-7) - 1 = 7 + 7 - 1 = 14 – 1 = 13 integers. The integers are -6, -5, -4, -3, -2, -1, 0, 1, 2, 3, 4, 5 and 6 but there is no integer between 2 and 3 since they are consecutive integers. Thus, we find that between two given integers there may or may not lie any integer.

How to insert many rational numbers between two rational numbers?

We can insert infinitely many rational numbers between any two rational numbers. This property of rational numbers is known as the dense property.

How to find out some rational numbers lying between two given rational numbers, say between -4/7 and 2/7. The four rational numbers -3/7, -2/7, -1/7, 0/7 and 1/7 lies between -4/7 and 2/7. We can apply the same procedure to insert more rational numbers between -4/7 and 2/7.

The rational numbers -4/7 and 2/7 can also be written as -40/70 and 20/70 respectively. Clearly, -39/70, -38/70, -37/70, -36/70, -35/70, ……., 0/70, 1/70, 2/70, 3/70, 4/70, ……., 18/70, 19/70 are rational numbers between -4/7 and 2/7. The total number of these rational numbers is same as the number of integers between -40 and 70, i.e., 70 - (-40) - 1 = 70 + 40 - 1 = 110 - 1 = 109.

If the rational numbers have different denominators, convert them to equivalent rational numbers with same denominator and use the similar method as discussed above.

QUESTION / ANSWER

Q. Determine whether the following rational numbers are positives or not:

(i) (-11)/3

SOLUTION: (-11)/3 is not a positive rational. Since the numerator and denominator are of the opposite sign.

(ii) (-5)/(-7)

SOLUTION: (-5)/(-7) is a positive rational. Since both the numerator and denominator are negative integers.

(iii) 13/19

SOLUTION: 13/19 is a positive rational. Since both the numerator and denominator are positive integers.

Q. Determine whether the following rational numbers are negatives or not:

(i) 3/(-8)

SOLUTION: 3/(-8) is a negative rational. Since both the numerator and denominator are of the opposite sign.

(ii) (-1)/(-5)

SOLUTION: (-1)/(-5) is not a negative rational. Since both the numerator and denominator are of the same sign.

Q. Express −54/90 as a rational number with denominator 5.

SOLUTION: In order to express −54/90 as a rational number with denominator 5, we first find a number which gives 5 when 90 is divided by it.

Clearly, such a number = (90 ÷ 5) = 18

Dividing the numerator and denominator of −54/90 by 18, we have

$$\frac{-54}{90} = \frac{(-54)\div 18}{90\div 18} = \frac{-3}{5}$$

Hence, expressing −54/90 as a rational number with denominator 5 is −3/5.

Q. Find an equivalent form of the rational numbers 2/9 and 5/6 having a common denominator.

SOLUTION: We have to convert 2/9 and 5/6 into equivalent rational numbers having common denominator.

Clearly, such a denominator is the LCM of 9 and 6.

We have, 9 = 3 × 3 and 6 = 2 × 3

Therefore, LCM of 9 and 6 is 2 × 3 × 3 = 18

Now, 18 ÷ 9 = 2 and 18 ÷ 6 = 3

Therefore, 2/9 = 2×2/9×2 = 4/18 and 5/6 = 5×3/6×3 = 15/18.

Hence, the given rational numbers with common denominator are 4/18 and 15/18.

Q. Express each of the following rational numbers in the standard form:

(i) −9/24 (ii) −14−35

SOLUTION:

(i) −9/24

The denominator of the rational number −9/24 is positive. In order to express it in standard form, we divide its numerator and denominator by the greatest common divisor of 9 and 24 i.e. 3.

Dividing the numerator and denominator of −9/24 by 3, we get

−9/24 = (−9)÷3/24÷3 = −3/8

Thus, the standard form of −9/24 is −3/8.

(ii) −14/−35

The denominator of the rational number −14/−35 is negative. So, we first make it positive.

Multiplying the numerator and denominator of −14/−35 by -1 we get

−14/−35 = (−14)×(−1)/(−35)×(−1) = 14/35

The greatest common divisor of 14 and 35 is 7.

Dividing the numerator and denominator of 14/35 by 7, we get

14/35 = 14÷7/35÷7 = 2/5

Hence, the standard form of a rational number −14/−35 is 2/5.

Q. Which of the two rational numbers 3/5 and −2/3 is greater?

SOLUTION: Clearly 3/5 is a positive rational number and −2/3 is a negative rational number. We know that every positive rational number is greater than every negative rational number.

Therefore, 3/5 > −2/3.

Q. Which of the numbers 3−4 and −56 is greater?

SOLUTION: First we write each of the given numbers with positive denominator.

One number = 3/−4 = $\frac{3\times(-1)}{(-4)\times(-1)}$ = −3/4.

The other number = −5/6.

L.C.M. of 4 and 6 = 12

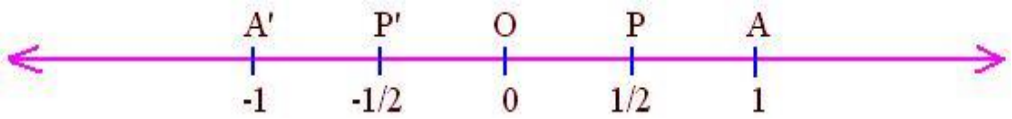
Therefore, −3/4 = $\frac{(-3)\times 3}{4\times 3}$ = −9/12 and −5/6 = (−5)×2/6×2 = −10/12

Clearly, −9/12 > −10/12

Hence, 3/−4 > −5/6.

Q. Represent 1/2 and −1/2 on the number line.

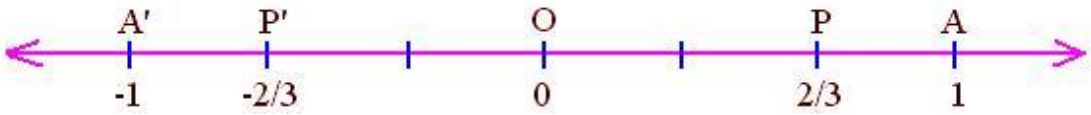
SOLUTION: Draw a line. Take a point O on it. Let the point O represent 0. Set off unit lengths OA to the right side of O and OA' to the left side of O such that OA = OA'. Then, A represents the integer 1 and A' represents the integer -1. Now, divide the segment OA into two equal parts. Let P be the mid-point of segment OA and OP be the first part out of these two parts. Thus, OP = PA = 1/2. Since, O represents 0 and A represents 1, therefore P represents the rational number 1/2.



Again, divide OA' into two equal parts. Let OP' be the first part out of these two parts. Thus, OP' = PA' = −1/2. Since, O represents 0 and A' represents -1, therefore P' represents the rational number −1/2.

Q. Represent 2/3 and −2/3 on the number line.

SOLUTION: Draw a line. Take a point O on it. Let the point O represent 0. Set off unit lengths OA to the right side of O and OA' to the left side of O. Then, A represents the integer 1 and A' represents the integer -1. Divide OA into three equal parts. Let OP be the segment showing 2 parts out of 3. Then the point P represents the rational number 2/3.



Again, divide OA' into three equal parts. Let OP' be the segment consisting of 2 parts out of these 3 parts. Then, the point P' represents the rational number −2/3

Q. Find the sum $\frac{7}{9}+\frac{(-11)}{9}$?

Solution: $\frac{7}{9}+\frac{(-11)}{9}=\frac{7+(-11)}{9}=\frac{7-11}{9}=\frac{-4}{9}$

Q. Subtract 9 from 4/5

SOLUTION: We have, 9 = 9/1

Clearly, denominators of the two rational numbers are positive. We now re-write them so that they have a common denominator equal to the LCM of the denominators.

In this case the denominators are 1 and 5.

The LCM of 1 and 5 is 5.

We have, 9 = 9/1 = 9 × 5/1 × 5 = 45/5

Therefore, 4/5 - 9 = 4/5 - 9/1

= 4/5 - 45/5

= (4 - 45)/5

= -41/5

Therefore, 4/5 - 9 = -41/5

Q. Find the difference between -3/4 and 5/6?

SOLUTION: The denominators of the given rational numbers are 4 and 6 respectively.

LCM of 4 and 6 = (2 × 2 × 3) = 12.

Now, -3/4 = (-3) × 3/4 × 3 = -9/12

and 5/6 = 5 × 2/6 × 2 = 10/12

Therefore, $\frac{-3}{4} - \frac{5}{6} = \frac{-9}{12} - \frac{10}{12} = \frac{-9-10}{12} = \frac{-19}{12}$

NOTE: students are directed to solve the exercises of the chapter and write them on fair copy along with the following assignments.

ASSIGNMENT

- Write the five equivalent rational numbers of 2/5.
- Write six rational number equivalent to 4/9.
- Determine whether the following rational numbers are positives or negative:
    1. 12/-2
    2. 12/23

3. -12/-4
4. -34/32

- Express −42/54 as a rational number with denominator 9.
- Which of the two rational numbers 13/5 and 2/7 is greater?
- Represent 3/5 and −2/5 on the number line.
- Find the sum $\frac{7}{3} + \frac{(-11)}{9}$?