CASE STUDY

I. A thermos flask, also known as a thermos, works on the principle of minimizing heat transfer through insulation. It typically consists of two layers of glass or metal with a vacuum in between to prevent heat transfer by conduction or convection. The outer layer is usually made of plastic or metal, and the inner layer is often coated with a reflective material to minimize radiant heat transfer. This design helps to keep hot liquids hot and cold liquids cold for extended periods of time.

1.Which is the fastest mode of heat transfer and why?

2. State an example in which we are able to observe all the three modes of transfer of heat at the same time

3. Explain the process of convection.

4. Mention any one application of the process of convection.

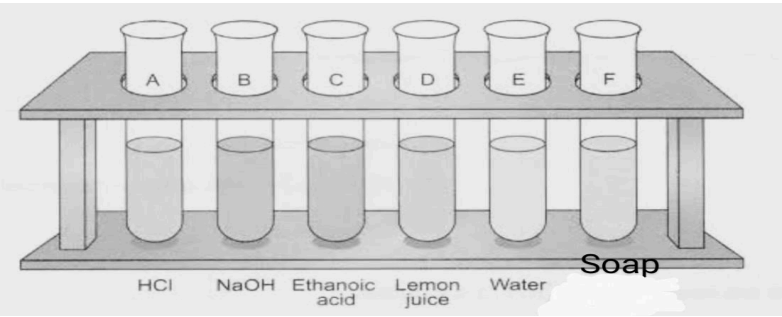
5. Can we minimize heat transfer through radiation? Support your answer with reason.

II. During the experiment students identify acid, base and neutral solution by using indicators. At first they observe the indicators list and their color change in acid and base then they perform experiments. List is given below

Olfactory indicators		Acid	Base
	Onion	Retain its smell	Loses its smell
	Vanilla extract	Retain its smell	Loses its smell
	Clove oil	Retain its smell oroma	Loses its smell
	Nilgiri oil	Retain its smell	Loses its smell

Indicator	Acidic solution	Basic solution
Blue litmus	Red	No change in colour
Red litmus	No change in colour	Blue
Phenolphthalein	Colourless	Pink
Methyl orange	Red	Yellow

Now in different test tubes different samples are there. (Picture is given below)



Give answer of the questions given below in table format

A. If at first blue litmus is given to each test tube then write the color change of each solution

Ans. (One example of table format, do the same in next question answer as well)

Solution	Colour change by using Blue litmus
HCl	
NaOH	
Ethanoic acid	
Lemon juice	
Water	
Soap	

B. If red litmus is given to each test tube then write the color change of each solution
C. If phenolphthalein is given to each test tube then write the color change of each solution
D. If methyl orange is given to each test tube then write the color change of each solution
E. If onion is given to each test tube then write the color change of each solution