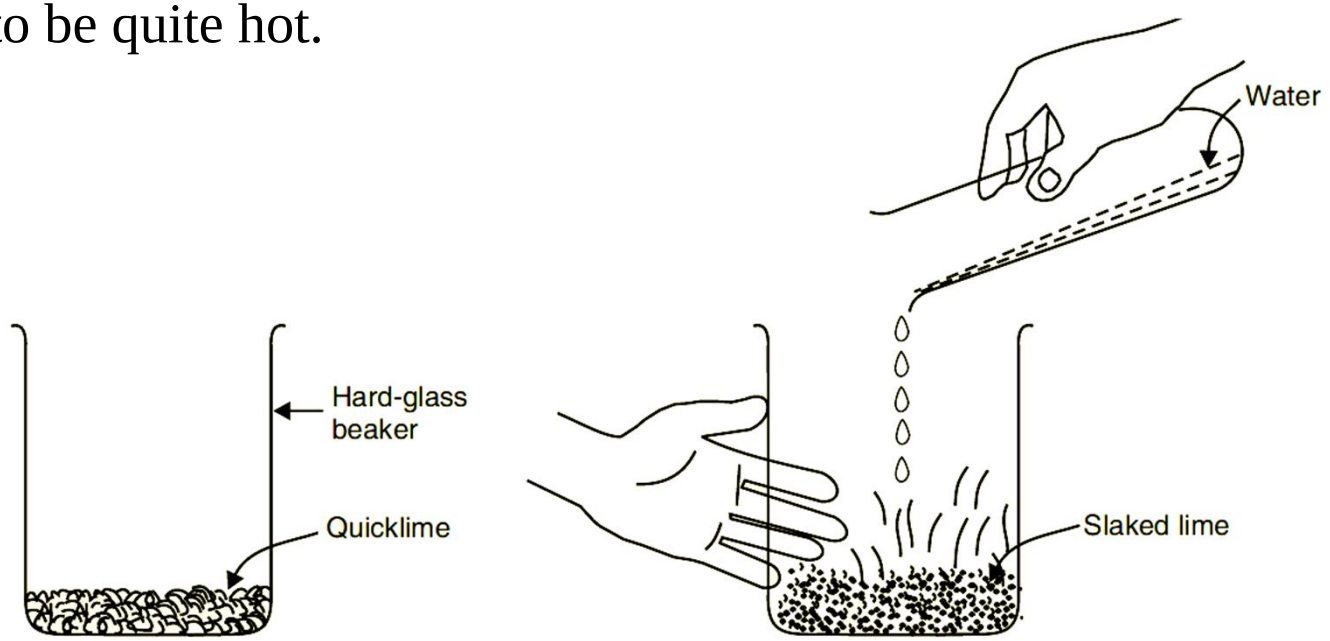
CASE STUDY QUESTION 09

Read the following and answer any four questions from (i) to (v)

Ajay wanted his house to be white washed. He bought 10 kg of quicklime from the market. Before mixing all 10 kg, he took one beaker and took small quantity of quicklime in a beaker then he added some water, he observed that the water started boiling even when it was not being heated and he touch the beaker carefully. The beaker feels to be quite hot.



(a)What is formed when water is added to quicklime.

(i) $CaCO_3$ (ii) CaO (iii) $Ca(OH)_2$ (iv) NaOH

Ans: (iii) Calcium hydroxide, $Ca(OH)_2$

(b) The nature of the product formed is:

(i) Acidic (ii) Basic (iii) Neutral (iv) Both (i) and (ii)

Ans: (ii) Calcium hydroxide is basic in nature.

(c) The chemical reaction between quicklime and water is characterised by :
(i) evolution of hydrogen gas
(ii) formation of slaked lime precipitate
(iii) change in temperature of mixture
(iv) change in colour of the product

The chemical reaction between quicklime (CaO) and water is characterized by change in temperature of mixture. The reaction is exothermic (heat is liberated) and a hissing sound is heard. The product is slaked lime (calcium hydroxide).

Ans: (iii) change in temperature of mixture

(d) Which of the following statements is correct about the above reaction based on your observations?
I. It is an endothermic reaction.
II. It is an exothermic reaction
III. The pH of the resulting solution will be more than seven.
IV. The pH of the resulting solution will be less than seven.

(i) I and II (ii) II and III (iii) I and IV (iv) III and IV

It is an exothermic reaction because heat is given out. The resulting compound is $Ca(OH)_2$ which is basic in nature. So the pH of the resulting solution will be more than seven.

Ans: (ii) II and III

(e) Which of the following is not an endothermic reaction ?

(*a*) $CaCO_3 \rightarrow CaO + CO_2$

(b) $2H_2O \rightarrow 2H_2 + O_2$

(c) $6CO_2 + 6H_2O \rightarrow C_6H_{12}O_6 + 6O_2$

(d) $C_6H_{12}O_6 + 6O_2 \rightarrow 6CO_2 + 6H_2O$

During respiration, glucose combines with oxygen in the cells of our body to form carbon dioxide and water alongwith the production of energy.

$$\underset{\text{Glucose}}{C_6H_{12}O_6\,(aq)} + \underset{\text{Oxygen}}{6O_2\,(g)} \longrightarrow \underset{\text{Carbon dioxide}}{6CO_2\,(g)} + \underset{\text{Water}}{6H_2O\,(l)} + \text{Energy}$$

Respiration is an exothermic process because energy is produced during this process

Ans: (d) $C_6H_{12}O_6 + 6O_2 \rightarrow 6CO_2 + 6H_2O$