

Question 6

(a) The following questions are related to the manufacture of hydrogen gas by the Bosch process.

- (i) Give the equation for the preparation of water gas.
- (ii) Why does the temperature of charcoal fall during the formation of water gas? [5]

(b) What will be the reaction between metals such as magnesium and aluminium with hot water or steam? [5]

Question 7

(a) A gas is enclosed in a vessel at standard temperature. At what temperature will the volume of a gas enclosed be $\frac{1}{6}$ th of its initial volume at constant pressure? [3]

(b) Carbon dioxide occupies a volume of 336 cm³ at STP. Find its volume at 20°C and a pressure of 700 mmHg. [2]

(c)

- i. A steel cylinder of internal volume 20 litres is filled with hydrogen at 29 atmospheric pressure. If hydrogen is used to fill a balloon at 1.25 atmospheric pressure at the same temperature, what volume will the gas occupy?
- ii. A cylinder of 20 litres capacity contains a gas at 100 atmospheric pressure. How many flasks of 200 cm³ capacity can be filled from it at 1 atmosphere pressure, temperature remaining constant?

[5]