

**Question 3**

**Compressibility factor,  $Z$ , of a gas is given as  $Z = PV/ nRT$**

- (i) What is the value of  $Z$  for an ideal gas?**
- (ii) For real gas what will be the effect on the value of  $Z$  above Boyle's temperature?**

**Solution**

- (i) Compressibility factor,  $Z$  is defined as the ratio of the product of pressure and volume to the product of the number of moles, gas constant and temperature. For an ideal gas, the value of  $Z$  is 1.
- (ii) Above Boyle's temperature,  $PV$  is greater than  $nRT$  for real gases so, the value of  $Z$  will also be greater than 1 i.e  $Z > 1$ , which shows the positive deviation in the compressibility factor above Boyle's temperature.