



- b) O has lower ionization enthalpy than N.
21. Calculate the wavelength, frequency and wave number of a light whose period is  $2.0 \times 10^{-10}$  sec.
22. a) State Charles's law.  
b) On a ship sailing in Pacific Ocean where the temperature is  $23.4^\circ\text{C}$ , a balloon is filled with 2L air. What will be the volume of the balloon when the ship reaches Indian Ocean, where the temperature is  $26.1^\circ\text{C}$ ?
23. One day Ritu and Meenu decided to cook the food at a hill station. Ritu takes a pan to cook food while Meenu started cooking the food in a pressure cooker at the same place.  
a) Who will cook food faster?  
b) What is the effect of pressure on boiling point?  
c) Pressure is lower or higher at hill stations?  
d) What value is associated with the pressure of cooking of food in different vessels?
24. a) Explain the line spectrum of Hydrogen.  
b) State Heisenberg's Uncertainty principle.

OR

- a) Write the subshell electronic configuration of Cu ( $Z = 29$ ) and Cl ( $Z = 17$ ).  
b) What are the limitations of Bohr model of atom?
25. Describe the hybridization of  $\text{PCl}_5$  molecule. Why are the axial bonds longer as compared to equatorial bonds?

OR

- a) Define Octet Rule. What are the limitations of octet rule?  
b) Write the Lewis structure of  $\text{CO}_3^{2-}$  (Carbonate ion).
26. a) State Hess's law.  
b) The enthalpy of combustion of methane, graphite and dihydrogen at 298K are  $-890 \text{ KJ/mol}$ ,  $-393.5 \text{ KJ/mol}$  and  $-285.8 \text{ KJ/mol}$  respectively. Calculate the enthalpy of formation of methane.