147.(D) $\frac{r_{mix}}{r_{SO_2}} = \sqrt{\frac{M_{SO_2}}{M_{mix}}} \Rightarrow 2.56 = \frac{64}{M_{mix}} \Rightarrow M_{mixture} = 25$

Let mole fraction of F_2 is x

$$25 = \frac{38\times x + (1-x)\times 19}{1}$$

$$x = 0.315; \Rightarrow K_p = \frac{P_F^2}{P_{F_2}} = \frac{(0.685P)^2}{(0.315P)} \simeq 1.49\,atm$$

148.(C) $\Delta_r G^\circ = 0 - 77.1\times 2 = -154.2\,kJ/mol$

$$Q = \frac{[H^+]^2}{P_{H_2}\cdot[Ag^+]^2} = \frac{10^{-6}}{0.5\times(10^{-10})} = 2\times 10^4$$

$$\Delta G = \Delta_r G^\circ + RT\ln Q$$

$$\Delta_r G = -154.2 + \frac{8.314\times 300\ln(2\times 10^4)}{1000} = -129.5\,kJ/mol$$

149.(D)

$$\underset{4-x}{N_2O_5} \rightleftharpoons \underset{x-y}{N_2O_3} + \underset{x+y}{O_2}$$

$$\underset{x-y}{N_2O_3} \rightleftharpoons \underset{y}{N_2O} + \underset{y+x}{O_2}$$

$\because \quad [O_2] = x + y = 2.5$ and $2.5 = \frac{(x+y)(x-y)}{4-x}$

$\therefore \quad x = 2.166$

$[N_2O_5] = 4 - x = 1.846$

150.(B) Let x is partial pressure of A and y is partial pressure of C when both equilibrium simultaneously established in a vessel

$$\underset{x}{X(s)} \rightleftharpoons \underset{(2x+2y);}{A(g)} + 2B(g)$$

$$K_{P_2} = P_A\cdot P_{B(total)}^2$$

$$\underset{y}{Y(s)} \rightleftharpoons \underset{(2y+2x);}{C(g)} + 2B(g)$$

$$K_{P_2} = P_C\cdot P_{B(total)}^2$$

$$\frac{K_{p_1}}{K_{p2}} = \frac{x}{y} \Rightarrow x = 2y$$

$K_{P_1} = x(2x+2y)^2 \Rightarrow x = 0.1\,atm; \quad \therefore \quad y = 0.05\,atm$

Total pressure of gasses $= P_A + P_B + P_C = 3(x+y) = 0.45\,atm$

151.(A) Comparing $\ln k = \frac{\Delta S_r^\circ}{R} - \frac{\Delta H_r^\circ}{RT}$ with $\ln k = 2 - \frac{1000}{T}$

$$\frac{\Delta S_r^\circ}{R} = 2 \Rightarrow \Delta S_r^\circ = 2R \Rightarrow \Delta S_r^\circ = 2\times \text{ value of R}$$

152.(B) For exothermic reaction low temperature is favourable.