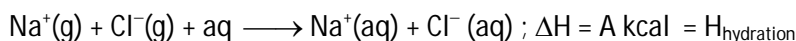
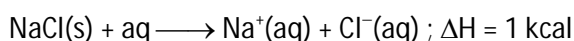


1. (D)

Sol.
$$\Delta S = \frac{\Delta H}{T} + R \ln \frac{P_i}{P_f} = \frac{40668}{373} + 8.314 \ln 10 = 128.17$$

2. (B) $\text{Na}^+(\text{g}) + \text{Cl}^-(\text{g}) \longrightarrow \text{NaCl}(\text{s}) ; \Delta H = -180 \text{ kcal}$



$$\therefore 1 = 180 + \Delta H_{\text{hydration}}$$

$$\therefore \Delta H_{\text{hydration}} = -179 \text{ kcal} = A$$

$$\Delta H_{\text{Na}^+}(\text{hydration}) + \Delta H_{\text{Cl}^-}(\text{hydration}) = A$$

$$\Delta H_{\text{Na}^+}(\text{hydration}) = \frac{6A}{11} = \frac{6 \times (-179)}{11} = -97.6 \text{ kcal.}$$

3. (C)
$$\frac{d}{dT} \left(\frac{\Delta G^\circ}{T} \right) = -\frac{\Delta H^\circ}{T^2}$$

$$= \frac{d}{dT} \left(\frac{10}{T} - 5 + 6 \ln T \right) = -\frac{\Delta H^\circ}{T^2}$$

$$\Rightarrow -\frac{10}{T^2} + \frac{6}{T} = -\frac{\Delta H^\circ}{T^2} \quad \Delta H^\circ = 10 - 6T$$

4. c 5. d 6. c 7. b 8. c 9. c 10. c

11. (ABD) 12. (C) 13. a, c, d 14. ABC 15. AB 16. ABD 17. A,b,c

18. (A) Since entropy and internal energy are state functions so for the entire process $\Delta U = 0, \Delta S = 0$

19. (C)

20. 2

21. (2)
$$\Delta S = -n_{\text{tot}} R \sum x_i \ln x_i$$

$$= -0.1 \times R \times \left(\frac{1}{10} \ln \frac{1}{10} \right) \times 10$$

$$= 2$$