Chemistry Sample Questions

1. This is the description of a phase transition, [B]
2. if the rates are equal we're in equilibrium, [C]
3. This is saying volume increases with temp, [D]
4. $AgI(s)$ precipitates out, [C]
5. H_3O^+ is conjugate to F^-, [E]
6. the oxidation state of Zn increases, so it is a reducing agent, [A]
7. clearly fluorine, [D]
8. X_2O_3 needs a 3+ on X, hence Al*, [A]
9.  , carbon is famous for this (see: all of organic chemistry) [B]
10. [I, F, not CE] (they are in the same period)
11. where is "the equation above"? assuming it should be $H_2SO_4 + 2\,NaOH \rightleftharpoons Na_2SO_4 + 2\,H_2O$, then [I, I, not CE] (molar mass is irrelevant)
12. a shift toward N_2O_4 decreases pressure, not the reverse, so [F, F, not CE]
13. all correct => [I, I, CE]
14. stoich is right but each Mg would lose two electrons, so [I, F, not CE]
15. statement is correct due to sig figs, not "standard practice" being 2 decimal places => [I, F, not CE]
16. classic $V \propto nR$ => [E]
17. four times pressure means $\frac{1}{4}$ volume => [B]
18. bigger nuclei mean smaller radii => [B]
19. look at periodic table => [C]

20. in $:O=C=O:$ the bonds are polar but opposite, [A]
21. classic hydrogen bonding, [E]
22. I think [B], isn't this called London dispersion?
23. the solid/gas transition is WX, i.e. [C]
24. $0.1 \cdot \frac{1}{5} = \frac{1}{50}$ mol base, so 50 mL, [A]
25. only II has high-ish concentration + low pH, [B]
26. wait, there's no question?
27. only D and E have the right ratio and 9 it is nonsense, [D]
28. add them up $\Rightarrow$ [C]
29. $2C_3H_8O + 9O_2 \rightleftharpoons 6CO_2 + 8H_2O$, [C]
30. final energy minus initial $\Rightarrow$ [E]