Q1:

$\boxed{(4)}$ belongs to group 15 (group V) instead.

Q2:

The total number of electrons is equal to the sum of atomic numbers.

(1): 7+7=14

$\boxed{(2)}$: $7 + 3 \cdot 1 = 10$

(3): 6+8=14

(4): 8+8=16

(5): 1+17=18

Q3:

The number of neutrons is equal to the mass number minus the atomic number.

(1): 14-7=7

(2): 15-7=8

$\boxed{(3)}$: 12-6=6

(4): 13-6=7

(5): 14-6=8

Q4:

The density of $NHO_3 = 1.38 \cdot 62\% = 0.8556\ g/mL$.

Therefore, the molarity=$\frac{0.8556 \cdot 1000}{1.0+14.0+3 \cdot 16.0} \approx \boxed{13.6}\ mol/L$.

Q5:

Number of moles of O atom=$11 \cdot \frac{1.71}{12 \cdot 12+22 \cdot 1.0+11 \cdot 16.0} = 0.055\ mol$.

Therefore, the number of O atoms=$0.055 \cdot 6.0 \times 10^{23} = \boxed{3.30 \times 10^2 2}$.

Q6:

By Avagrados' law, the volume is proportional to the number of mole. Hence we only have to compare the number of moles (i.e. the molecular mass, as the mass is fixed):

(1): $2 \cdot 16.0 = 32.0$

(2): $2 \cdot 14.0 = 28.0$

(3): $12.0 + 16.0 = 28.0$

(4): 4.0.

$\boxed{(5)}$: $2 \cdot 35.5 = 71$

Q7:

By Avagrados' law, the volume is proportional to the number of mole.

Therefore, consider the molar ratio, 2 L of O_2 is required for the reaction.

After the reaction, 0 L of CH_4 and 4 L of O_2 are remained and 1 L of CO is

formed.

Therefore, the total volume of gases=4+1=$\boxed{5\ L}$.

Q8:

The molar ratio $M : O = \frac{0.70}{56.0} : \frac{1.00-0.70}{16.0} = 2 : 3$.

Therefore, the empirical formula is $\boxed{M_2O_3}$.

Q9:

When 1.00 L of methane, i.e. $\frac{1.00}{22.4}\ mol$ of it is combusted, $\frac{1}{22.4} \cdot 891 \approx \boxed{+39.8\ kJ}$ of heat is released.

Q10:

In the experiment, the acetic acid is diluted in a volumetric flask (it is not important whether it is dry or wet). Then, a dry and clean pipette is used to transfer the diluted acetic acid to a beaker (it is not important whether it is dry or wet). On the other hand, the $NaOH$ solution is added into a dry and clean buret.

As the titrate is a weak acid-strong base titration, phenolphthalein is a suitable indicator.

$\boxed{(5)}$

Q11:

Number of moles of $H^+ = 2 \cdot \frac{3.15}{2 \cdot 12.0 + 6 \cdot 16.0 + 6 \cdot 1.0} \cdot \frac{8.00}{500} = 0.0008\ mol.$

Therefore, the concentration of the NaOH solution is $\frac{0.0008}{\frac{10.0}{1000}} = \boxed{0.0800\ mol/L}$.

Q12:

The oxidation numbers are:

(1): +1

(2): +2

(3): +3

(4): +4

$\boxed{(5)}$: +5

Q13:

The reaction is a displacement reaction, which happens when the reactivity of the metal is higher than that of the cation. Therefore, $\boxed{(5)}$ has reaction.

Q14:

In the electrolyssi of $NaCl$, H^+ is reduced to H_2 at the cathode.

(1): Cu^{2+} is reduced to Cu at the cathode.

(2): H_2SO_4 is reduced to SO_2 at the cathode.

$\boxed{(3)}$: H^+ is reduced to H_2 at the cathode. (4): Ag^+ is reduced to Ag at the cathode.

(5): Cu^{2+} is reduced to Cu at the cathode.

Q15:

By common sense, $Ni - Cd$ battery $\boxed{(4)}$ is rechargeable.

Q16:

Note the electrons flow from the negative pole to the positive pole.

Therefore, the reaction at the anode is $Zn \to Zn^{2+} + 2e^-$, which results in a decrease in mass.

On the other hand, the reaction at the cathode is $Cu^{2+} + 2e^- \to Cu$, which results in an increase in mass.

Q17:

Consider the weight percentage of C in CO_2 formed, the mass of C atoms in the compound is $88 \cdot \frac{12.0}{12.0+2\cdot16.0} = 24\ mg$.

Similarly, the mass of H atoms in the compound is $6\ mg$.

Then, the mass of O atoms is $62 - 24 - 6 = 32\ mg$.

The molar ratio $C : H : O = \frac{24}{12.0} : \frac{6}{1.0} : \frac{32}{16.0} = 1 : 3 : 1$.

Therefore, the empirical formula is $\boxed{CH_3O}$.

Q18:

Isomers:

C_3H_6: Prop-1-ene, Prop-2-ene

C_3H_8: Propane

C_4H_8: But-1-ene, But-2-ene, Methylpropene

C_4H_{10}: Butane, Methylpropane

C_5H_{12}: Pentane, Methylbutane, Dimethylpropane, Ethylpropane

Therefore, the correct option is $\boxed{(3)}$.

Q19:

$FeCl_3$ can test the presence of phenol.

Among the options, only $\boxed{(1)}$ does not contain phenol (the -OH group is used to form the ester linkage).

Q20:

Condensation polymerisation has more than 1 monomer involved. Judging from their names, only $\boxed{(1)}$ has two monomers.