Nuclear Decay Worksheet MC answers

1. B since decay is occurring and only Po and Pb are present, one must be decaying to produce the other. Po has 84 protons and Pb has 82. the only way that a decay process can involve only these two elements is if Po undergoes alpha decay to produce Pb.
   (II)alpha decay

2. C Since decay is occurring and only potassium and calcium are represent, one must be decaying to produce the other. Potassium and calcium differ by one proton, so they decay process must either ad or subtract a proton.
   (I)Beta decay is possible
   (III) Electron capture is possible.
   (II)Alpha decay causes the loss of two protons, thus cannot be occurring.

3. B it takes two half-lives for the amount of K to decrease to 25%. If two half-life's takes 44 minutes, one half life must take 22 minutes.

4. B in beta decay, a nuclide releases a beta particle (which is the same as an electron) and converts a neutron to a proton.

5. E Mass defect is the mass that seems to disappear from neutrons and protons when they are brought together to form a nucleus.

6. A in B+ decay, the mass number remains constant and the proton number decreases by one, so the two nuclides must have the same mass number and differ by on e in their proton numbers.

7. A in electron capture, the mass number remains constant and the proton number decreases by one, so the two nuclides must have the same mass number and differ by one in their proton numbers.

8. C In Alpha decay, a particle with mass (4) and charge (+2) of a helium nucleus is given off, so the two nuclides must differ by a mass of 4 and a charge of 2.

9. A From the periodic table, we can see that Sn has an atomic mass of 118.71, so 128 is a very large mass number for Sn. The nuclide will decay to increase its proton to neutron ratio, thereby making itself more stable.

10. D $^{214}_{84}Po - ^{4}_{2}a - ^{4}_{2}a - ^{-1}_{-1}B - ^{-1}_{-1}B=$
    for the mass number: 214-4-4-=206
    for the proton number we have: 84-4+2=82
    so, the answer is $^{206}_{82}Pb$