Answer to Ques 2: Recall that in the Simple Neural Networks notes, we had been asked to find the backwards propagation steps for the pathway highlighted in the figure:

Isolating that pathway, gave us the following slide:

Then, focusing on

And paying attention to each of the red-arrows to obtain the dependencies,

we saw there that (note that “a” and “out” are the same quantities):

 ∂E/∂w1 = **∂E/∂out \* ∂out/∂z \* ∂z/∂a1 \* ∂a1/∂z1 \* ∂z1/∂w1**

And, similarly, we saw that:

 ∂E/∂w7 = **∂E/∂out \* ∂out/∂z \* ∂z/∂w7**

For our new problem in the practice test, we are being asked to do the newly highlighted pathway:

So, we will need to get:

 ∂E/∂w9

and, similarly, we need:

 ∂E/∂w12.

Using the same approach as before, we get:

 ∂E/∂w9 = ∂E/∂out \* ∂out/∂z \* ∂z/∂a3 \* ∂a3/∂z3 \* ∂z3/∂w9

and

 ∂E/∂w12 = ∂E/∂out \* ∂out/∂z \* ∂z/∂w12.

These last two equations are all that you need to write for the answer to this question.