2. a. Draw and label a typical isodose curve for a 10cm x 10cm, 6MV photon beam incident perpendicularly to the surface of a water phantom at 100cm SSD. Discuss the clinically important features of this curve.
b. Discuss the importance of density/heterogeneity correction for CT planning in calculating the dose deposition for potentially curative treatment of lung cancer.

Would draw a 6MV isodose curve
Clinically important features (would show on curve)

- Surface dose of about 30% this is correct but the dose rises very rapidly in the first 1-2 mm
- Maximum dose at 1.5cm
- Beam is divergent and divergent beam edge is 50% (the definition!)
- Rapid dose fall off at edges correct, but this is called PENUMBRA and while centred on the field edge (=50%), it extends from 90%>20% over a distacne of ???5-6mm
- Isodose curve is flat at 10cm (~70%) oh? Where is it not flat?
- Beam is penetrating with 50% isodose curve at ~16cm

Clinically ~~useful~~ features of photon beam you need to be very specific with reproduction of what is asked for! The question says "important" not useful.

- low surface dose, hence skin sparing
- narrow penumbra, hence rapid fall off outside tumor – leads to sharp field definition!
- penetrating, would be able to reach deep tumors

b) When photons pass through objects of different densities, the amount the beam attenuates and scatters will vary. These factors should to be taken into consideration with CT planning. In treating a lung cancer, the photon beam would have to pass through bone, tissue and lung (mostly air) this is a good introduction

Diagrams of % depth dose vs distance.
Difference in attenuation between bone tissue and air

In treatment of lung, when passing through different tissues, where will be variable (yes, you have already said this! BUT what are the specifics of the variation) attenuation and dose deposition.

When passing through variable density materials, there will also be a variable amount of lateral scatter. There you go again, variable variable variable. You need to say what comes next and get rid of the first line.
Tissues next to bone will receive a higher amount of lateral scatter while tissues next to lung will receive less. But tell me why be so specific about lateral scatter when you haven't described transmission changes?

Again here, a diagram with isodose curves running through air and lung, demonstrating difference in scatter.

Hence in treatment of lung cancer, if the density/ heterogeneity correction was not taken into account in planning, the tumor may not receive an adequate dose for cure.

In treating lung cancer, there are also organs at risk. One important structure is the spinal cord, which is surrounded by bony vertebrae. If density correction was not factored, the estimated dose received to important structures like spinal cord, may not be accurate.

This last bit is indistinct. Will the lack of inhomogeneity correction produce an under estimate or over estimate? You need to be specific about these predictions.