**Exercise 2 – questions (50 points)**

1. Describe how different parts of the cerebral cortex differ in the number and thickness of cortical layers. (5 points)
2. Assuming that concentration of Ca2+ ions outside the cell is 2,000 times greater than inside, what is the Nernst equilibrium potential for Ca2+? (5 points)
3. Given normal intra- and extracellular concentrations of Na+, K+, Cl-, Ca2+ ions, for which of them is the overall electrochemical gradient inwards, and for which outwards? (4 points)
4. If at rest, some Na+ and K+ channels are open, how are the different concentrations of these ions inside and outside the cell membrane maintained? (3 points)
5. What is the function of voltage-gates Na+ channels? (3 points)
6. The action potentials of a given cell are characterised by 3 main attributes: amplitude, shape, frequency. Which of these can be influenced by the strength of the signaling input? (3 points)
7. Name 3 neurotransmitters that are commonly excitatory and 3 that are typically inhibitory (6 points).
8. Which type of imaging is typically used first on patients suspected to have a stroke, and why? (5 points)
9. Which type of imaging is seen as more reliable in stroke detection? (2 points)
10. What are contrast agents in MRI and CT, and what are the risks associated with their use? (6 points)
11. Which atoms are typically excited in magnetic resonance imaging? (3 points)
12. Which are the most common image types in MRI and how do they differ? (5 points)