

UNIVERSITY OF LONDON
NEUROSCIENCE MSc EXAMINATION

**For Internal Students of the
INSTITUTE OF PSYCHIATRY
King's College London**

12th December 2012 at 14:00 - 16:30

PAPER A1

Answer FOUR questions only

1. Neurons are cells, like any other in the body, just very specialised. How true is this statement?
2. Describe the routes taken by somatosensory information from spinal nerves to the cortex and also comment on the sensory deficits expected from hemisection of the cervical spinal cord.
3. Describe the primary functions of astrocytes and, using appropriate examples, discuss their importance for neuronal function.
4. How do you test a hypothesis and what do you do if it is proved to be wrong?
5. Using a G-protein coupled receptor as an example, explain how and where signal amplification occurs following ligand binding and why this is important in the CNS.
6. How does the Bcl2 family of proteins (Bcl2, BH123, and BH3) regulate cytochrome c release from the mitochondrion?
7. Write brief notes on affinity, efficacy, log- dose response (LDR) curves, agonists, partial agonists, antagonists, inverse agonists, ED50, Bmax, Kd, saturation curves and displacement curves - use figures where appropriate.
8. Explain the architecture of the ion channel - compare and contrast voltage and ligand-gated channels.
9. What ways other than by neurotransmission can cells signal to each other?
10. Describe a mechanism the cell might use to alter the expression of around twenty genes at the same time where the genes are located on different chromosomes.