

**UNIVERSITY OF LONDON**  
**NEUROSCIENCE MSc EXAMINATION**

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

**16 January 2012 at 14:00 – 16:30 hrs**

**PAPER A2**

**Answer FOUR questions only**

1. Define the genetic terms genotype, dominant, autosomal and homozygous.
2. What is copy number variation and why is it important in psychiatric conditions?
3. What is meant by the 'inside-out' pattern of cerebral cortex development? Describe an experiment that would reveal this pattern. Outline two other developmental features that could be revealed by similar experiments.
4. Discuss the role of Wnt signalling in brain patterning.
5. Explain the purpose of the "stripe assay" and where it was used initially.
6. Describe the function of the different cell types that exist within the adult neurogenic niches.
7. Discuss two experimental studies that have provided important evidence that LTP is required for memory formation. Is there a form of plasticity distinct from LTP that is important for memory formation?
8. Using an example of a three-layered backpropagation network, explain the role of the hidden layer.
9. What is the evidence that microglia participate in neuronal regeneration?
10. Outline the geographic variation in the incidence of multiple sclerosis (MS), and give reasons why these variations may occur.