

UNIVERSITY OF LONDON
NEUROSCIENCE MSc EXAMINATION

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

15th January 2010 at 10:00 am - 12:30 pm

PAPER A2

Answer FOUR questions only

1. Describe the principles behind genome wide association study (GWAS) approaches to the identification of genetic susceptibility factors for complex disorders such as schizophrenia.
2. Define the genetic terms phenotype, sex-linked, recessive and heterozygous, illustrating your answer with examples from human psychiatric and/or neurological disease.
3. Describe *in vitro* assays that have been used to identify and analyse axon guidance molecules.
4. Discuss the importance of patterned neuronal activity in the formation of neuronal circuits.
5. Choose a developmental disorder. Describe the characteristics (e.g. genotypic and phenotypic aspects) that you would expect to find in a mouse modelling this disorder and how this might be useful to researchers.
6. Discuss whether or not synaptic plasticity contributes to memory formation.
7. Describe an unsupervised neural network learning algorithm.
8. What is the function of class I and class II molecules encoded by the major histocompatibility complex (MHC)? Which cells in the brain express these molecules, and under what circumstances?
9. Outline the nature and functions of transporters on brain endothelial cells, in relation to the metabolic requirements and activities of the CNS.
10. Discuss how the CNS microenvironment maintains microglia in a 'resting' state under normal physiological conditions.