KING'S COLLEGE LONDON

NEUROSCIENCE MSc EXAMINATION

INSTITUTE OF PSYCHIATRY, PSYCHOLOGY AND NEUROSCIENCE
King's College London

22nd of January 2015 at 14:00 - 16:30

PAPER A3

Answer FOUR questions only

A3.1 Systems Neuroscience

1. Explain, with examples, why chronic pain might develop.

2. Explain the role of the cerebellum in the control of movement.

3. Does the functional organisation of cortico-striatal circuits fully explain the pattern of cognitive impairment seen in Parkinson's disease?

A3.2 Addiction Biology

4. Describe the cellular and molecular mechanisms which explain the dysphoric stage that follows opiate withdrawal.

5. Define drug addiction according to the Diagnostic and Statistical Manual of Mental Disorders, 4th Edition (DSM IV) criteria. Using three specific animal models as examples, describe how these criteria can be modelled in experimental rodents.

A3.3 Neuropsychology of Mental Health

6. Explain the neurobiology of Attention Deficit Hyperactivity Disorder (ADHD).

7. Discuss evidence that the positive symptoms of schizophrenia arise from altered dopamine transmission.

8. Outline a taxonomy of memory and indicate what aspects of memory are affected and what relatively preserved in pure amnestic conditions.

A3.4 Neuroimaging

9. Give two examples of using magnetic resonance imaging for detecting functional and/or flow related changes in the CNS in preclinical models, and explain how this can be used to enhance our knowledge about a disease or biological process.

10. Compare and contrast two of the main functional neuroimaging techniques.

A3.5 Neurodegeneration

11. What is the relationship between storage material accumulation, glial activation and neuron loss in the neuronal ceroid lipofuscinoses, and how was this elucidated?

12. Describe how the proteinopathy cascade hypothesis of neurodegeneration can be supported by disease pathophysiology (using at least one example).

13. Explain how exogenous prions reach the Central Nervous System.

14. Explain the pathogenic mechanisms leading to neurodegeneration in Parkinson's Disease.