

**UNIVERSITY COLLEGE LONDON**

University of London

**EXAMINATION FOR INTERNAL STUDENTS**

For The Following Qualification:-

*M.Sc.*

**M.Sc. Clinical Neuroscience: Paper 3**

**COURSE CODE : CLNEM003**

**DATE : 11-MAY-05**

**TIME : 10.00**

**TIME ALLOWED : 3 Hours**

## **PAPER THREE**

### **IMPORTANT:**

- **WRITE ON ONE SIDE OF THE PAPER ONLY**
- **BEGIN EACH NEW QUESTION ON A FRESH PAGE**

*Please ignore other instructions to the contrary*

*12 general questions.*

**Answer two questions only.**

*Each question carries 50 marks.*

*Allow about 90 min for each question.*

1. Discuss brain energy metabolism in the context of neurodegenerative diseases/conditions.
2. Discuss the current understanding of the pathophysiological mechanisms through which an infection can cause acute dysfunction of the central nervous system.
3. Structural damage to the CNS has long been considered to be irreparable. To what extent have recent developments in stem cell biology and other areas of neurobiology altered this view?
4. Review the inborn errors of metabolism affecting dopamine and serotonin availability. Explain (a) the diagnostic approaches used to identify patients with such disorders and (b) the therapeutic strategies used in the treatment of such individuals.
5. How does a knowledge of the epidemiology of a disease help in the planning of the provision of clinical services? Illustrate your answer using the example of epilepsy.
6. What, if any, is the importance of temporal patterning of neural activity in health and disease?
7. Discuss the aetiology and pathogenesis of Parkinson's disease (PD), in particular the genetic contribution to familial PD and the biochemical abnormalities known to exist in idiopathic PD.
8. What is meant by the terms 'toxic gain of function' or 'dominant negative effects' when analysing how gene mutations cause disease?
9. Describe structure-function relationships in the human cerebral cortex.
10. Discuss neural mechanisms underlying addiction. How may this knowledge inform treatment strategies?
11. Describe the major categories of neurodegenerative dementias and discuss their leading pathological features.
12. Describe the statistical analysis of a simple block-design fMRI experiment, stating clearly the assumptions made and the purpose of each stage of the analysis.

[End of paper]