

**UNIVERSITY COLLEGE LONDON**

University of London

**EXAMINATION FOR INTERNAL STUDENTS**

For The Following Qualification:–

*M.Sc.*

**M.Sc. Clinical Neuroscience: Paper 2**

**COURSE CODE : CLNEM002**

**DATE : 05-MAY-06**

**TIME : 10.00**

**TIME ALLOWED : 3 Hours**

## PAPER TWO

### **IMPORTANT:**

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

*Please ignore other instructions to the contrary*

In *Part 1* of the paper, *answer three essay questions.*

You must answer:

**one question from Section A (25 marks)**

**one question from Section B (25 marks)**

**one question from Section C (25 marks)**

In *Part 2* of the paper, *answer three short-answer questions (8 marks each)*

**Part 1** (Allow yourself approx. 45 min per question.)

### **Section A**

*6 questions from Theme C (Systems Neuroscience), sub-themes C1, C2 (Nociception and Pain, Motor Control).*

1. Discuss the mode of action of drugs that have been shown to be efficacious in the treatment of neuropathic pain.
2. Discuss the evidence that descending control of spinal nociception is a major determinant of the pain experience.
3. How does the brain organise a voluntary movement? What features of the corticospinal system reflect this organisation?
4. How would you measure central motor conduction time (CMCT)? Give examples of how this changes with age and in neurological disease.
5. How would you distinguish between these causes of syncope on the basis of cardiovascular autonomic function testing: (a) autonomic failure, (b) vasovagal syncope, (d) carotid sinus supersensitivity and (d) pseudo-syncope?
6. What evidence, including observations on pacemaker neurones, has led to the view that the mammalian respiratory rhythm may be generated at more than one medullary site?

**TURN OVER**

## **Section B**

*6 questions from Theme C (Systems Neuroscience), sub-themes C3, C4 (Basal Ganglia/Movement Disorders, Hearing, Balance, Vision and Eye Movements).*

7. What are the common indications and contra-indications of surgery for Parkinson's disease?
8. L-dopa represents a triumph for rational pharmacotherapy – discuss.
9. Discuss the inherited gene mutations that can give rise to clinical syndromes resembling Huntington's disease. How do they differ from Huntington's disease clinically and in what ways are they similar?
10. Outline the contribution of mitochondria to Parkinson's disease aetiology and pathogenesis.
11. Provide an overview of the anatomical structures and physiological mechanisms responsible for balance in humans.
12. The generation of saccadic eye movements provides an example of functional cortical specialisation - discuss.

## **Section C**

*6 questions from Theme D (Higher Functions of the Brain)*

13. Discuss the value of evidence-based medicine with reference to the clinical trials of treatment for acute ischaemic stroke.
14. What is the evidence for specialisation of function in higher areas of human visual cortex?
15. Describe different tests used in memory research & discuss how the results from these tests can inform our understanding of memory and brain function.
16. “The concept of the limbic system should be discarded” J LeDoux, 1996. Discuss the historical and functional neuroanatomical validity of the limbic system concept.
17. Define dementia and compare and contrast Alzheimer's disease and frontotemporal lobar degeneration.
18. Describe the major neuropathological features of tauopathies.

**CONTINUED**

**Part 2** (Allow yourself approx. 15 min per question.)

*10 short-answer questions on Themes C and D*

19. Give a brief summary of the anatomic structures and their connections which have been identified as critical in the generation of acute migraine attacks.
20. Explain how transcranial magnetic stimulation over the hand area of motor cortex may activate corticospinal neurones.
21. Describe first and second line treatments for neurogenic bladder disorders.
22. Discuss the dopamine dysregulation syndrome in Parkinsons disease (hedonic homeostatic dysregulation).
23.
  - a. Name 4 major categories of behavioural tests that are currently used for the diagnosis of Auditory Processing Disorders.
  - b. Mention 5 different factors that ought to be considered in order to choose an appropriate test for the diagnosis of an Auditory Processing Disorder.
24. Aphasia is the most frequent cognitive deficit in the early and late phase of stroke: describe some of the factors which have a negative influence on recovery from aphasia.
25. What have neuropsychological studies of brain damaged patients taught us about the storage of retrograde memories?
26. Describe the laminar-specific organisation of extrinsic connections among visual areas in primate cortex, highlighting the anatomical differences between forwards and backwards connections?
27. What are the physical and biochemical differences between the normal prion protein PrP<sup>C</sup> and the disease-associated isoform PrP<sup>Sc</sup>?
28. Describe pharmacological options that are currently available for the treatment of Alzheimer's disease.

[End of paper]