

NATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY

APPLIED PHYSICS DEPARTMENT

SRA 2206 - IMAGING OF NEURO-ENDOCRINE SYSTEM I

BSc HONOURS PART II: MAY 2004 DURATION: 3 HOURS

ANSWER **ALL** PARTS OF SECTION A AND ANY **THREE** IN SECTION B. SECTION A CARRIES 40 MARKS AND SECTION B CARRIES 60 MARKS

SECTION A

1. (a) (i) Name any six of the cranial nerves (not Roman Numerals) [3]
(ii) Give a function of each of the named nerves in (a) and state the foramen/fissure through which they pass through. [6]
- (b) Give 3 examples of neuroglial cells and state one function of each. [3]
- (c) Explain the term 'pyramidal decussation' [2]
- (d) On the diagram attached label the structures A - J. [5]
- (e) Give the origins and actions of these hormones
(i) prolactin
(ii) glucagon
(iii) progesterone
- (f) State the hormone which mimics the sympathetic nervous stimulation and state its site of secretion. [1½]
- (g) With reference to the autonomic nervous system, state the effect of sympathetic stimulation on the following organs.
(i) pupil of the eyes
(ii) sweat glands
(iii) bronchii
(iv) blood vessels of skin
(v) coronary arteries
(vi) afferent arteries of the kidney. [3]
- (h) How does the hypothalamus control and interglate the autonomic nervous system.
- (i) Distinguish between an endocrine and an exocrine gland. [2]
- (j) Outline the function of the parathyroid gland. [2]

- (k) What is the clinical significance of an electro encephalogram (EEG) [2]
- (l) Explain the problems that can arise due to an injury of the spinal cord above
(i) the third cervical vertebrae
(ii) the fifth lumbar vertebrae [3]

SECTION B

2. (a) Name 5 principal parts of the ear and give a function of each. [5]
- (b) With reference to the eye, describe the physiology of vision. [7]
- (c) Explain the following disorders of the eye and ear.
(i) achromatopia
(ii) cataract
(iii) ptosis
(iv) vertigo
(v) presbycusis
(vi) otitis media. [6]
3. (a) Name 5 parts of the brain. [2½]
- (b) For the part which comprises most of the brain tissue.
(i) describe its gross anatomy
(ii) position and relations
(iii) coverings
(iv) function [12½]
- (c) Define the following pathological terms
(i) Ataxia
(ii) Dyslexia
(iii) Alzheimer's disease
(iv) Parkinson's disease
(v) Neuralgia. [5]
4. (a) Contrast cerebrospinal fluid and blood. [2]
- (b) What are the functions of cerebrospinal fluid. [3]
- (c) A sample of cerebrospinal fluid is indicated on an adult male patient. Briefly explain how this sample is obtained outlining the precautionary measures to be taken and an indication for the procedure. [5]

(d) Describe the formation, circulation and absorption of cerebrospinal fluid. [10]

5. With reference to the thyroid gland.

(a) Describe its gross and microscopic anatomy. [8]

(b) Name the hormones it secretes and give a function of each. [6]

(c) Explain two pathological conditions that can affect the thyroid gland. [3]

(d) Explain the role of imaging/radiotherapy in pathology associated with the thyroid gland [3]

6. (a) Distinguish between diabetes mellitus and diabetes insipidus. [2]

(b) Compare and contrast the sign and symptoms of hyperglycaemic coma and hypoglycaemic coma and in each case describe the first aid treatment that should be given to the patient. [15]

(c) What special care should be given to a diabetic patient attending a clinical department for a radio diagnostic or radio therapeutic procedure. [3]

