

NATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY

APPLIED PHYSICS DEPARTMENT

FUNDAMENTALS OF IMAGING - SRA 1101

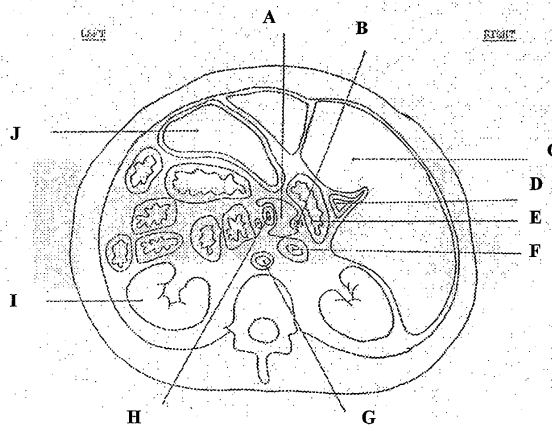
EXAMINATION

BSc HONOURS PART I : DECEMBER 2004 DURATION : 3 HOURS

ANSWER ALL QUESTIONS IN SECTION A AND ANY THREE QUESTIONS FROM SECTION B. SECTION A CARRIES 40 MARKS AND SECTION B CARRIES 60 MARKS.

SECTION A

1. (a) (i) Define homeostasis. [1]
(ii) What systems of the body control homeostasis [2]
- (b) Describe and explain anatomical position. [3]
- (c) Giving *two* examples, describe what is meant by a directional term. [3]
- (d) The diagram below is a cross section at the level of the first lumbar vertebra. Label A to J. [5]



- (f) Explain the following pathological terms:
 (i) dystrophy,
 (ii) neoplasm,
 (iii) atrophy. [3]
- (g) Describe *five* surface landmarks of the head. [5]
- (h) Name the bones that form the cranial cavity. [4]
- (i) Briefly explain the classification of body types, outlining their clinical significance in radiography. [5]
- (j) Distinguish covering and lining from glandular epithelium. [5]
- (k) State the vertebral levels of the following;
 (i) sternal angle,
 (ii) lower costal margin,
 (iii) upper border of manubrium sterni,
 (iv) cricoid cartilage. [2]

SECTION B

2. (a) Describe the basic steps involved in the production of a radiographic image. [6]
 (b) What factors affect radiological image quality? [4]
 (c) Outline the principles of any four medical imaging modalities. [8]
 (d) What are the differences between photography and radiography? [2]
3. (a) Define an anatomical plane. [1]
 (b) Describe how the human body can be divided into various planes. [5]
 (c) Describe the different methods that can be used to sub-divide the abdominal -pelvic region. [12]
 (d) What are the advantages/disadvantages of the modes you have given in (b)? [2]

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4. (a) Distinguish between two types of cell division. Explain the processes associated with type. [18]
- (b) What significance do these divisions have in the field of radiography? [2]
5. (a) Outline the biological effects of ionising radiation on human tissues. [15]
- (b) What general measures can be implemented to reduce the amount of exposure to ionising radiation in medical use? [5]
6. (a) Describe the principal functions of bone tissue. [5]
- (b) Describe the process of ossification of long bone. [10]
- (c) Outline the factors that influence bone growth, remodelling and repair. [5]