

**NATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY**

**APPLIED PHYSICS DEPARTMENT**

**EXAMINATION**

**SRA 2105 –RESPIRATORY SYSTEM**

*BSc HONOURS PART II: DECEMBER 2005*

*DURATION: 3 HOURS*

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

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1. (a) Justify the use of an FFD of 150cm to 180cm for chest radiography. [5]
- (b) (i) What is a tracheostomy. [1]
- (ii) Explain the care of patient with a tracheostomy in the x-ray / radiotherapy department. [4]
- (c) Explain two pathologies of the larynx. [3]
- (d) What is the clinical significance of injury at the level of the third cervical vertebrae? [3]
- (e) How does pleural effusion manifest itself radiographically? [3]
- (f) With reference to imaging of the chest, what is the advantage of using asymmetrical film screen combination? [5]
- (g) State any 3 gas laws and explain their relation to respiration. [6]
- (h) Relate the physiology of the alveoli capillary membrane to its anatomy. [5]
- (i) Explain the following pathologies of the respiratory system:  
i. silicosis,  
ii. bronchiectasis,  
iii. Gohns focus,  
iv. asthma,  
v. respiratory failure. [5]

2. A patient is referred to the radiodiagnostic department with a suspected foreign body in the lungs. He has developed emphysema and pneumothorax.
- (a) Differentiate between obstructive emphysema and pneumothorax. [4]
  - (b) Analyse the technique you would adopt for this patient to come up with a differential diagnosis. [10]
  - (c) Justify a technique adopted to demonstrate a **small** pneumothorax. [6]
- 3.
- (a) Describe the gross anatomy of the left lung. [8]
  - (b) Justify the radiographic projection you would do for a patient presenting for a chest x-ray query lung abscess. [7]
  - (c) Discuss how radiation doses can be minimized in chest radiography. [5]
- 4.
- (a) Describe the gross anatomy of the pharynx [8]
  - (b) A 2 year old girl presents for radiography of the post nasal space.
    - (i) Outline two problems that may be encountered in trying to come up with an image of diagnostic value and how these can be overcome. [4]
    - (ii) Describe the radiographic technique to demonstrate the post nasal space and the subsequent radiographic appearance. [8]
- 5.
- (a) The respiratory system is said to resemble a trumpet model. Discuss. [10]
  - (b) Discuss the radiographic technique to demonstrate diaphragmatic excursion. [10]
- 6.
- (a) A request form is received to radiograph the chest of a female patient in the intensive care unit. Discuss the management of this patient. [15]
  - (b) Explain the criteria you would use to assess the technical quality of a chest radiograph. [5]