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**NATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY**  
**APPLIED PHYSICS DEPARTMENT**  
**THE CHEST - SRA 2105**

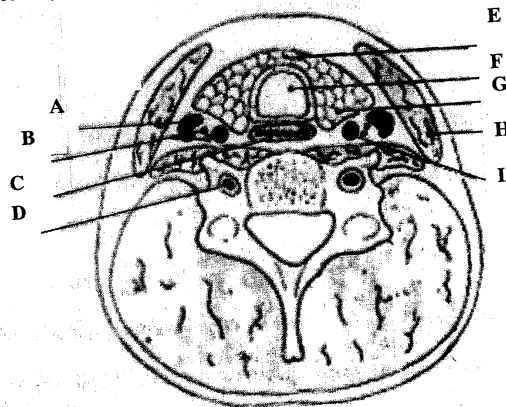
**EXAMINATION**

*BSc HONOURS PART II : 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) The diagram below is a horizontal section through the sixth cervical vertebrae (C6).



- (i) label this diagram. [5]
- (ii) which of these structures are not present at the level of the seventh cervical vertebrae (C7) [2]

- (b) Describe the effects of the following on the respiratory system:
- (i) aging, [2]
  - (ii) exercise. [2]
- (c) Relate the structure of the nose to its function. [5]
- (d) Differentiate between indirect and direct laryngoscopy giving an indication for the procedure in each case. [3]
- (e) State and explain *three* gas-laws that are related to the respiratory system, showing their application in each case. [6]
- (f) A patient under your care suffers a severe asthmatic attack, explain how you would care for this patient. [4]
- (g) Explain how and why the exposure factors for an average patient would be altered for the following conditions:
- (i) emphysema, [2]
  - (ii) pleural effusion. [2]
- (h) Explain why you might choose to take a P.A. projection rather than an A. P. projection for a chest. [3]
- (i) A patient with suspected lung abscess is brought to the imaging department. Explain how the projection chosen will help the clinicians come up with a differential diagnosis. [4]

#### SECTION B

- 2 (a) Describe the structure of the right lung and pleura. [10]
- (b) Name the organs that form impressions on the left lung. [2]
- (c) Define the following pathological conditions and describe their radiographic appearances;
- (i) haemothorax,
  - (ii) pneumothorax,
  - (iii) pneumonia,
  - (iv) bronchiectasis. [8]

3. (a) With regards to Chronic Obstructive Airway Diseases, [2]
- (i) define the condition, [2]
  - (ii) outline any practical problems which a radiographer may encounter when dealing with such a patient. [3]
  - (iii) discuss the imaging techniques used in the diagnosis of lung pathologies. [15]
4. (a) Describe a procedure of suctioning a tracheostomy patient in a clinical department. [10]
- (b) State and describe a radiographic projection to demonstrate inter lobar pleural effusions. [5]
- (c) State measures which should be taken to reduce radiation dose to the following tissues during chest radiography:
- (i) gonads,
  - (ii) lens,
  - (iii) breast,
  - (iv) red bone marrow,
  - (v) skin. [5]
5. One of your colleagues is having problems in evaluating the quality of chest radiographs. List and discuss the points you would include in considering this problem with the radiographer. [20]
6. (a) Describe the gross anatomy of the diaphragm. [8]
- (b) State two pathologies that may affect the diaphragm. [2]
- (c) Describe a radiographic technique to demonstrate diaphragmatic excursion. [8]
- (d) Give *four* requirements of equipment suitable for chest radiography. [2]





