

NATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY

APPLIED PHYSICS DEPARTMENT

EXAMINATION

SRA 2103 – THE ABDOMEN – URINARY 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

- 1
- (a) Justify the care given to a patient with an indwelling catheter in your department. [5]
 - (b) Justify your choice of exposure factors for an abdomen to demonstrate kidneys, ureters and bladder. [5]
 - (c) A water soluble contrast agent is given to a patient intravenously through the median cubital vein. Describe its flow through the kidney. [5]
 - (d) Relate the endothelial capsular membrane to its function. [6]
 - (e) With reference to the urinary system, define the following:-
 - i. urinalysis,
 - ii. azotemia'
 - iii nocturia'
 - iv glucosuria,
 - v haematuria. [5]
 - (f) Outline the contra-indications for performing intravenous urography. [5]
 - (g) Explain the function of the juxta glomerular apparatus. [3]
 - (h) Compare and contrast the causes of urinary retention and urinary incontinence. [3]
 - (i) Describe the effects of glomerular filtration rate, blood pressure and diuretics on the volume of urine formed. [3]

SECTION B

2. (a) Describe the ureters, relating any structural variations to pathology. [10]
(b) Discuss the role of imaging in ureteric colic. [10]
3. Critically evaluate an appropriate imaging modality that can be used to best demonstrate each of the following conditions:
a. left renal calculus,
b. renal cyst,
c. ureteric reflux in children,
d. renal induced hypertension. [20]
4. (a) Describe the gross anatomy of the kidney. [6]
(b) Explain the consequences of renal failure. [2]
(c) Discuss the available options for management of renal failure. [6]
(d) For one of the options in (c), discuss the role of imaging. [6]
5. (a) Critically evaluate the role of intravenous urography in demonstrating renal pathology. [10]
(b) Discuss the technique modifications that may be required to demonstrate the following in excretion urography:-
i. Obstructive uropathy, [4]
ii. Faecal laden transverse colon overlying kidneys, [3]
iii. Ureters where these are not readily visible on a full length release film. [3]
6. (a) Relate the anatomy of the bladder to its physiology. [8]
(b) In relation to one pathology, discuss imaging of the urinary bladder and urethra. [12]