

**NATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY
APPLIED PHYSICS DEPARTMENT**

**SRA1214- HEALTH AND SAFETY AT WORK AND WELFARE SERVICES
SUPPLEMENTARY EXAMINATION
BSc HONOURS IN RADIOGRAPHY- PART I**

JULY 2014

DURATION: 3HOURS

ANSWER **ALL** PARTS OF QUESTION 1 IN SECTION A AND ANY THREE QUESTIONS FROM SECTION B. SECTION A CARRIES 40 MARKS AND SECTION B 60 MARKS.

SECTION A

1. (a) Outline disposal of waste policies that can be implemented to minimise spread of infection. [3]
- (b) Identify and explain the choice of muscles to use in safe lifting of a load from the floor. [5]
- (c) Distinguish between a hazard and a risk. [2]
- (d) Define the classes of fire as stated in the BS EN 2 classification. [8]
- (e) A student notices smoke coming out of an x-ray tube housing and immediately reports the matter to you. Explain how you would handle this incident. [6]
- (f) Identify radiation hazards associated with different regions of the electromagnetic spectrum. [6]
- (g) Explain the use of different ionising radiation hazard symbols recommended by the International Atomic Energy Agency. [4]
- (h) With respect to ionising radiation exposure, define the terms:
 - i. Chronic exposure, [2]
 - ii. Acute exposure and [2]
 - iii. Latent period. [2]

SECTION B

2. (a) Compare and contrast radiation hormesis conjecture and standard linear, no threshold (LNT) model. [6]
- (b) Outline measures that can be adopted by radiology departments in order to control unwanted ionising radiation exposure to humans. [8]
- (c) Describe the three levels used in the justification of ionising radiation exposures. [6]
3. (a) Define the term optimisation as applied in radiology services [3]
- (b) With respect to basic safety standards in the provision of radiology services, outline conditions that require corrective measures to be taken. [3]
- (c) With respect to incidental exposures, outline the obligations of registrants and licensees. [13]
3. (a) Explain the relevance of access control in radiology departments. [4]
- (a) Describe the following access control terms:
- i. Unrestricted area, [5]
- ii. Controlled area and [5]
- iv. Restricted area [6]
5. (a) Explain the rationale for exempting students from the requirement of registration as users of radiation producing equipment. [2]
- (b) Outline the provisions governing the operation of radiation producing equipment. [18]
6. (a) Describe the hygienic hand washing technique. [3]
- (b) With respect to hospital infections, compare and contrast permanent and temporary flora (pathogens in the skin flora). [8]

(c) Explain how the general design of a radiology department may affect.

i. health [3]

ii. safety and [3]

iii. patient care [3]

END OF EXAMINATION