



UNIVERSITY OF RUHUNA – FACULTY OF ALLIED HEALTH SCIENCES

DEPARTMENT OF PHARMACY

FOURTH BPHARM PART II EXAMINATION – DECEMBER 2018

PH 4241 RADIO PHARMACY (SEQ)

TIME: TWO HOURS

INSTRUCTIONS

- There are **four (04)** questions of SEQ paper.
- Answer **all** questions in the booklet provided.
- No paper should be removed from the examination hall.
- Do not use any correction fluid.
- Use illustrations where necessary.

1.

- 1.1 Define the term specific radioactivity (10 marks)
- 1.2 Gamma radiation is used to sterilize the medical devices. (20 marks)
- 1.2.1 Discuss the advantages and disadvantages of above process. (20 marks)
- 1.2.2 State the radionuclide used for the above process and state **four** examples. (20 marks)
- 1.3 Define the following terms related to radiopharmaceuticals. (10 marks)
- 1.3.1 Physical half-life (10 marks)
- 1.3.2 Biological half-life (20 marks)
- 1.4 How are radioisotopes produced by a cyclotron machine? (10 marks)
- 1.5 List **four** radioisotopes that are produced by cyclotrons. (10 marks)

2.

- 2.1 List **five** desirable properties of radiopharmaceuticals. (20 marks)
- 2.2 List **two** advantages and **two** disadvantages of a radiopharmaceutical. (15 marks)
- 2.3 List **three** parameters that determine the radiation dose following administration of radiopharmaceuticals. (20 marks)
- 2.4 State the precautions that should be taken to avoid radiation accident in the department. (25 marks)
- 2.5 State the details that should be included on a label of a radiopharmaceutical syringe. (25 marks)

- 3.** A beta source and a Geiger Muller (GM) counter are used to make sure the thickness of a 0.2 mm Aluminum sheet. First measured the background radiation and the reading was 50 counts per minute.
- 3.1 What is a Geiger-Muller counter? (20 marks)
- 3.2 List **two** possible sources of back ground radiation. (10 marks)
- 3.3 How is beta radiation produced? (15 marks)
- 3.4 Why is beta radiation not suitable to check the thickness of a Lead apron? (15 marks)

- 3.5 Suggest a radiation type and a source to be used to check the thickness of lead apron and explain why this radiation is not suitable to measure above 0.2 mm Al sheet. (20 marks)
- 3.6 Briefly explain the photoelectric absorption process (20 marks)

4. Information about a radioactive source is given in the table below.

Activity	Half life	Energy absorbed per kg of tissue	Radiation weighing factor
600 MBq	6 hours	40 cGy	1

- 4.1 Define the term “radioactive absorbed dose”. (20 marks)
- 4.2 What is meant by “Radiation Weighing Factor”? (15 marks)
- 4.3 If the exposed tissue mass is 2.5 kg, find the radiation energy absorbed by it. (15 marks)
- 4.4 Find the Equivalent Dose using the above given table. (10 marks)
- 4.5 Calculate the activity of the source after four (04) hours. (20 marks)
- 4.6 Briefly explain the deterministic effect and give two examples. (20 marks)

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