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UNIVERSITY OF RUHUNA – FACULTY OF MEDICINE

ALLIED HEALTH SCIENCES DEGREE PROGRAMME

FOURTH BPHARM PART II EXAMINATION – JULY 2016

PH 4241: RADIO PHARMACY (SEQ)

TIME: TWO HOURS

INSTRUCTIONS

- Answer **all** questions.
- Do not use any correction fluid.
- Answer questions in the given answer book.
- Marks will be deducted for illegible hand writing.

1.

1.1 Briefly describe the term "Radiotracer" (***25 marks***)

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1.2 State six (06) physical characteristics of an ideal radiopharmaceutical to be used in medical imaging. (***30 marks***)

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1.3 Briefly describe the beta decay process and give two radionuclide nuclear equations decay by beta emitting. (***25 marks***)

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1.4 List four (04) radionuclides used in medicine with their half lives. (***20 marks***)

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2.

2.1 Name four (04) methods of manufacturing radiopharmaceuticals (***20 marks***)

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2.2 Draw a labeled diagram of a Molybdenum generator and explain the function of it. (***30 marks***)

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2.3 Briefly explain any two (02) important aspects in the formulation of radiopharmaceuticals. (*20 marks*)

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2.4 List protective tools necessary when handling radiopharmaceuticals (*30 marks*)

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3.

3.1 Define the term "Becquerel" (Bq) and explain what is meant by half life and decay constant of a radioisotope. ***(30 marks)***

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3.2 What is the relationship between half life and decay constant ***(10 marks)***

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3.3 Write down the equation for the activity of a radioactive sample changes with time t. ***(10 marks)***

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3.4 Calculate the total minimum activity of ^{99m}Tc eluate needed to insert to a vial of ^{99m}Tc-pyrophosphate at 8 a.m., to obtain five injections of 740 MBq each as follows;

(i) 2 injections at 8 a.m.

(ii) 3 injections at 11a.m.

(The half-life of ^{99m}Tc is 6 hours) ***(30 marks)***

3.5 Geiger counter placed at 30cm from ^{99m}Tc vial and display 4000 counts per minute. Calculate the count rate at 1 meter from ^{99m}Tc vial. (***20 marks***)