

Question Paper

Exam Date & Time: 28-Jun-2022 (10:00 AM - 01:00 PM)



MANIPAL ACADEMY OF HIGHER EDUCATION

SECOND SEMESTER B.Sc. RADIOTHERAPY TECHNOLOGY DEGREE EXAMINATION - JUNE/JULY 2022
SUBJECT: RTT1201 - RADIATION PHYSICS
(2020 SCHEME)

Marks: 100

Duration: 180 mins.

Answer all the questions.

- 1) How X-rays are generated. Discuss in detail about the physics of X-rays. (20)
- 2) Discuss in details about interaction of electrons with matter. (20)
- 3) Discuss about the alpha, beta and gamma decay processes with examples. (10)
- 4) What is filtration? Explain different types of filters used in X-ray tube. (10)
- 5A) Write short note on X-ray spectrum. (5)
- 5B) Define half-life. What is the decay constant of Cobalt-60 source ($T_{1/2} = 5.26$ years). (5)
- 5C) Explain Heel effect. (5)
- 5D) Discuss about fission and fusion reactions with examples. (5)
- 5E) Discuss about the properties of electromagnetic radiation. (5)
- 5F) Explain photoelectric effect. (5)
- 6A) Define Ionization & Excitation. (2)
- 6B) What is isomer? Give an example. (2)
- 6C) List advantage of rotating anode X-ray tube. (2)
- 6D) Define Inverse square law. (2)
- 6E) Define Mass attenuation coefficient. (2)

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Question Paper

Exam Date & Time: 30-Jun-2022 (10:00 AM - 01:00 PM)



MANIPAL ACADEMY OF HIGHER EDUCATION

SECOND SEMESTER B.Sc. RADIOTHERAPY TECHNOLOGY DEGREE EXAMINATION - JUNE/JULY 2022
SUBJECT: RTT1202 - RADIATION QUANTITIES AND DETECTION
(2020 SCHEME)

Marks: 100

Duration: 180 mins.

Answer all the questions.

- 1) Discuss about the principle, construction and working of organic and inorganic scintillation radiation detector with the neat diagram. (20)
- 2) Define: a) Activity; b) Fluence; c) Absorbed Dose; d) KERMA; e) Exposure; f) Specific Activity, with all relevant notions and units. (20)
- 3) Discuss about principle and working of semiconductor detector. (10)
- 4) Write a short note on Thimble chamber and parallel plate chamber. (10)
- 5A) Discuss about Thermoluminescent Dosimeter. (5)
- 5B) Write briefly about RBE. (5)
- 5C) What are the ideal characteristic of a survey meters. (5)
- 5D) Define Roentgen and KERMA rate constant. (5)
- 5E) Define equivalent dose and effective dose. (5)
- 5F) Define Ionization and excitation of atoms. (5)
- 6A) Name the different gases filled in proportional counter. (2)
- 6B) Draw the V-I characteristic curve of gas filled detector. (2)
- 6C) Give an example for directly ionizing and indirectly ionizing radiation. (2)
- 6D) Define Electronic equilibrium. (2)
- 6E) Define Dead time. (2)

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Question Paper

Exam Date & Time: 02-Jul-2022 (10:00 AM - 12:00 PM)



MANIPAL ACADEMY OF HIGHER EDUCATION

**SECOND SEMESTER BOT / B.Sc. PFT / BPT/ B.Sc. OPTOM. / B.Sc. CVT /B.Sc. RESPIRATORY THERAPY /B.Sc. MIT
/B.Sc. RRT&DT / B.Sc. EMT / B.Sc. AOTT / B.Sc. MLT / B.Sc. NMT/B.Sc. RADIOTHERAPY TECHNOLOGY DEGREE
EXAMINATION - JUNE/JULY 2022
SUBJECT: PHY1201 - PHYSIOLOGY - II
(2020 SCHEME)**

Marks: 50

Duration: 120 mins.

**All questions are compulsory. Write brief, clear and legible answers.
Illustrate your answers with diagrams and flow charts wherever appropriate.**

- 1) Name the Anterior pituitary hormones. Describe the actions of growth hormone. Add a note on Acromegaly. (10)
(3+5+2 = 10 marks)
- 2) With the help of neat diagram describe the origin, course, and termination of pyramidal tract. List the differences between upper motor lesion and lower motor neuron lesion. (10)
(6+4 = 10 marks)
- 3A) Explain the different phases of gastric juice secretion. (5)
- 3B) Define GFR, give its normal value. Explain briefly the factors regulating GFR. (5)
(2+3 = 5 marks)
- 3C) Explain the ovarian changes during menstrual cycle and briefly explain the influence of different hormones on ovarian cycle. (5)
(3+2 = 5 marks)
- 3D) Enumerate the functions of hypothalamus. Explain any ONE in detail. (5)
(3+2 = 5 marks)
- 4A) Mention the cause and Any TWO features of Cretinism. (2)
- 4B) Enumerate the functions of gall bladder. (2)
- 4C) List the different types of small intestinal movements. (2)
- 4D) Classify sensory receptors based on type of stimulus with examples for each. (2)
- 4E) Mention the cause and treatment of Parkinson's disease. (2)

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Question Paper

Exam Date & Time: 04-Jul-2022 (10:00 AM - 01:00 PM)



MANIPAL ACADEMY OF HIGHER EDUCATION

SECOND SEMESTER B.Sc. RADIOTHERAPY TECHNOLOGY DEGREE EXAMINATION - JUNE/JULY 2022
SUBJECT: RTT1203 - RADIOBIOLOGY
(2020 SCHEME)

Marks: 100

Duration: 180 mins.

Answer all the questions.

- 1) Explain the physical, chemical and biological modifiers of radiation damage at cellular level. (20)
- 2) Describe the role of repair of sublethal damage, surviving fraction at 2Gy (SF2), tumour cell repopulation and reoxygenation in radiotherapy. (20)
- 3) Explain the difference between HDR, LDR and Permanent implant techniques used for brachytherapy. (10)
- 4) Describe the radiation effects on intestine, reproductive system and eye lens. (10)
- 5A) Explain the term "OER" with the help of survival curves under euoxic and anoxic conditions. (5)
- 5B) Explain the RBE and LET relationship for the induction of chromosomal aberrations. (5)
- 5C) Explain the terms "Tumour Growth Delay" and "Tumour Cure". (5)
- 5D) Explain the mechanism of late damage in skin and lungs. (5)
- 5E) Explain the dose response for deterministic and stochastic effects with the help of a neat diagram. (5)
- 5F) Describe the effects of exposure in utero at different stages of pregnancy. (5)
- 6A) What do you mean by a mutation? (2)
- 6B) Why do deterministic effects have a threshold dose below which we cannot detect them? (2)
- 6C) What do you mean by accelerated fractionation schedule? (2)
- 6D) What do you understand by LD50(30) dose? (2)
- 6E) What is meant by tumour cure probability? (2)

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Question Paper

Exam Date & Time: 06-Jul-2022 (10:00 AM - 12:00 PM)



MANIPAL ACADEMY OF HIGHER EDUCATION

SECOND SEMESTER B.Sc. RADIOTHERAPY TECHNOLOGY DEGREE EXAMINATION - JUNE/JULY 2022
SUBJECT: RTT1205 - HOSPITAL PRACTICE AND PATIENT CARE
(2020 SCHEME)

Marks: 50

Duration: 120 mins.

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| 1A) | Write a short note on management of radiation side effect | (10) |
| 1B) | Explain the procedures involved in a radiotherapy department | (10) |
| 2A) | Briefly explain the types of catheterization | (4) |
| 2B) | What are the instructions to be given for patients during and after completion of radiotherapy? | (4) |
| 2C) | Write a short note on skin care during radiation therapy | (4) |
| 2D) | Write a short note on urinary diversions | (4) |
| 2E) | Write a short note on medico-legal cases registration | (4) |
| 3A) | Define late side effects of radiation | (2) |
| 3B) | In which condition patient information can be released without patient permission? | (2) |
| 3C) | What are the equipment's used for the procedure of catheterization? | (2) |
| 3D) | What are the characteristics of stoma? | (2) |
| 3E) | How to maintain healthy bones? | (2) |

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