

Question Paper

Exam Date & Time: 24-May-2022 (10:00 AM - 01:00 PM)



MANIPAL ACADEMY OF HIGHER EDUCATION

FOURTH SEMESTER B.Sc. RADIOTHERAPY TECHNOLOGY DEGREE EXAMINATION - MAY 2022
SUBJECT: RTT2201 - PHYSICS OF EXTERNAL BEAM RADIOTHERAPY
(2020 SCHEME)

Marks: 100

Duration: 180 mins.

Answer all the questions.

Draw neat and labelled diagrams wherever necessary.

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| 1) | Briefly explain the concept of Percentage Depth Dose. Mention the factors affecting it. | (20) |
| 2) | Discuss in detail about different types of wedge filters. | (20) |
| 3) | Write short on field shaping devices. | (10) |
| 4) | Write short note on collimator and phantom scatter factor. | (10) |
| 5A) | Write a note on parallel opposed field. | (5) |
| 5B) | Write a note on CT Simulator. | (5) |
| 5C) | Write a note on Electronic Portal Imaging Device. | (5) |
| 5D) | Write short note on tissue compensator. | (5) |
| 5E) | Discuss about the characteristics of electron depth dose curve. | (5) |
| 5F) | Write short note on phantom. | (5) |
| 6A) | Define wedge angle. | (2) |
| 6B) | Define geometric field size. | (2) |
| 6C) | Define Tissue Maximum Ratio. | (2) |
| 6D) | What are advantages of parallel opposed fields? | (2) |
| 6E) | Define " D_{max} " and what is D_{max} of Co-60 and 6 MV photon beams. | (2) |

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Question Paper

Exam Date & Time: 26-May-2022 (10:00 AM - 01:00 PM)



MANIPAL ACADEMY OF HIGHER EDUCATION

FOURTH SEMESTER B.Sc. RADIOTHERAPY TECHNOLOGY DEGREE EXAMINATION - MAY 2022
SUBJECT: RTT2202 - PRINCIPLES AND PRACTICE OF RADIOLOGY PART II
(2020 SCHEME)

Marks: 100

Duration: 180 mins.

Answer all the questions.

- 1) Explain in detail about MRI safety (20)
- 2) Explain various components of imaging system and computer system (20)
- 3) Explain the working principle of scintillation detectors and gas ionization detectors along with a diagram. (10)
- 4) List the different techniques used in Digital subtraction angiography. Explain simple mask subtraction in detail. (10)
- 5A) Write a short on multi row or multi slice detectors. (5)
- 5B) Briefly explain about volume rendering techniques in CT. (5)
- 5C) Write a note on third generation CT scanners (5)
- 5D) List the various CT reconstruction algorithms. Add a note on iterative reconstruction (5)
- 5E) Write a short note on MR active nuclei (5)
- 5F) Outline the workflow of digital fluoroscopy (5)
- 6A) What are the advantages of Multiplanar Reconstruction? (2)
- 6B) Define window width and window level (2)
- 6C) Mention two advantages of MRI (2)
- 6D) State the basic principle of CT (2)
- 6E) What is EBCT? (2)

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Question Paper

Exam Date & Time: 30-May-2022 (10:00 AM - 12:00 PM)



MANIPAL ACADEMY OF HIGHER EDUCATION

FOURTH SEMESTER B.Sc. MEDICAL RADIOTHERAPY TECHNOLOGY DEGREE EXAMINATION - MAY/JUNE 2022
SUBJECT: RTT2241 - PROGRAM ELECTIVE-I - PHYSICS OF BRACHYTHERAPY
(2020 SCHEME)

Marks: 50

Duration: 120 mins.

Answer all the questions.

- 1) Derive the expression $N=N_0 e^{-\lambda t}$ and arrive at the equation of half life. (10)
- 2) Discuss in detail the various parameter to determine the source strength. (10)

- 3A) What are the ideal characteristic of brachytherapy source. (5)
- 3B) Mention the specification of any 3 sources used in permanent implant brachytherapy. (5)
- 3C) Write a short note on Paris system of implant dosimetry. (5)
- 3D) Write a note on Interstitial Brachytherapy. (5)

- 4A) Equivalent mass of radium. (2)
- 4B) Define Apparent activity. (2)
- 4C) Short note on cesium brachytherapy source. (2)
- 4D) Calculate the decay constant of a radioactive source if the half-life is 12 days. (2)
- 4E) Define KERMA. (2)

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