Question Paper

Exam Date & Time: 20-May-2024 (10:00 AM - 01:00 PM)

MANIPAL ACADEMY OF HIGHER EDUCATION

SECOND SEMESTER B.Sc. RADIOTHERAPY TECHNOLOGY DEGREE EXAMINATION - MAY/JUNE 2024
SUBJECT: RTT1201 - RADIATION PHYSICS
(2020 SCHEME)

Marks: 100 **Duration: 180 mins.**

Answer all the questions.

1)	Discuss about the nuclear stability. Explain in detail about, alpha, beta, and gamma decay process with examples	(20)
2)	How x-rays are generated. Discuss in detail about the physics of x-rays.	(20)
3)	What are the types of anodes used in x ray tube? Explain the advantages and disadvantages in detail.	(10)
4)	Discuss in detail about interaction of neutrons with matter	(10)
5A)	Explain Photoelectric effect	(5)
5B)	Explain different types of filters used in x-ray tube?	(5)
5C)	Write a short note on Cooling of x-ray tubes	(5)
5D)	Write note on inelastic scattering of photons	(5)
5E)	Write short note on atomic models	(5)
5F)	Explain inverse square law	(5)
6A)	Define Range	(2)
6B)	Write Symbolic representation of a nucleus. Given an example	(2)
6C)	Define attenuation and define half value layer	(2)
6D)	Why Molybdenum is used in mammography	(2)
6E)	What is saturation voltage	(2)

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Question Paper

Exam Date & Time: 24-May-2024 (10:00 AM - 01:00 PM)

MANIPAL ACADEMY OF HIGHER EDUCATION

SECOND SEMESTER B.Sc. RT DEGREE EXAMINATION - MAY/JUNE 2024
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 electronic equilibrium. Discuss in detail about free air ionization chamber.	(20)
3)	Discuss the principle and working of TLD.	(10)
4)	Define any four radiometry quantities with all relevant notions and units.	(10)
5A)	Write briefly about the effective dose and equivalent dose.	(5)
5B)	Write a short note on the Area zone monitor.	(5)
5C)	Define specific activity with its units. What is its significance.	(5)
5D)	Write a short note on film badges.	(5)
5E)	Write short note on Semiconductor detector.	(5)
5F)	Give two examples each for ionizing and non ionizing radiations.	(5)
6A)	10Bq=_____Ci.	(2)
6B)	Mention different filters used in TLD badges.	(2)
6C)	Mention the fill gas used in GM counters.	(2)
6D)	1 Roentgen =_____ C/kg.	(2)
6E)	Draw the curve defining the different regions of gas filled detectors.	(2)

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Question Paper

Exam Date & Time: 27-May-2024 (10:00 AM - 01:00 PM)

MANIPAL ACADEMY OF HIGHER EDUCATION

SECOND SEMESTER B.Sc. RADIOTHERAPY TECHNOLOGY DEGREE EXAMINATION - MAY/JUNE 2024
SUBJECT: RTT1203 - RADIOBIOLOGY
(2020 SCHEME)

Marks: 100 **Duration: 180 mins.**

Answer all the questions.

1A)	Describe the damage to blood and blood forming organs following whole body exposure to 4 Gy gamma radiation dose	(20)
1B)	Discuss the differences between stochastic and deterministic effects of radiation with a few examples	(20)
2A)	Describe the radiation effects on intestine, reproductive system and eye lens	(10)
2B)	Derive an expression for BED based on linear quadratic model of cell survival and explain the meaning of α /β value	(10)
3A)	Explain the mechanism of late effects of radiation	(5)
3B)	Describe the structure of a typical mammalian cell with the help of a neat diagram	(5)
3C)	Explain the problem of hypoxia in radiotherapy of cancer	(5)
3D)	Explain the relationship between tumour biokinetic factors cell cycle time, potentially doubling time, growth fraction, cell loss factor and volume doubling time	(5)
3E)	Explain the law of Bergonie and Tribondeu to predict the cell sensitivity	(5)
3F)	How does accelerated fractionation improve tumour response?	(5)
4A)	What is the doubling dose at low dose rates for the induction of gene mutations ?	(2)
4B)	What is the latent period for the induction of radiogenic cancers?	(2)
4C)	What is the cancer risk to occupational radiation workers chronically exposed to effective dose of 100mSv ?	(2)
4D)	What is the most important effect of dose fractionation?	(2)
4E)	What are the important types of radiation induced DNA Damage?	(2)

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Question Paper

Exam Date & Time: 29-May-2024 (10:00 AM - 12:00 PM)

MANIPAL ACADEMY OF HIGHER EDUCATION

SECOND SEMESTER B.Sc. RADIOTHERAPY TECHNOLOGY DEGREE EXAMINATION - MAY/JUNE 2024
SUBJECT: RTT1205 - HOSPITAL PRACTICE AND PATIENT CARE
(2020 SCHEME)

Marks: 50 **Duration: 120 mins.**

Answer all the questions.

1)	Explain the professional attitude of a radiation technologists towards patients and other staff members of the hospital.	(10)
2)	What are the lifting and moving techniques to be used for cancer patient in radiotherapy?	(10)
3A)	Write a short note on short term side effects of radiation.	(5)
3B)	When medical records are usually summened in a court of law?	(5)
3C)	Briefly explain the steps in catheterisation of bladder.	(5)
3D)	Explain the complications of stoma.	(5)
4A)	What are the indications for catheterisation?	(2)
4B)	Write about laboratory investigation in cancer patient.	(2)
4C)	Write about medical council of India guidelines on medical records.	(2)
4D)	Define cardiopulmonary resuscitation.	(2)
4E)	What is universal precautions?	(2)

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