



MANIPAL UNIVERSITY

SECOND SEMESTER B.Sc. M.R.T. DEGREE EXAMINATION - AUGUST 2017
SUBJECT: RADIATION PHYSICS (BMRT 104)
(2016 SCHEME)
Friday, August 18, 2017 (14.00 - 17.00 Hrs.)

Marks: 100

Duration: 180 mins.

Answer all the questions.

- 1) What is radioactivity? Discuss about the Properties of alpha, beta and gamma radiations. (20)
- 2) Draw a neat labeled diagram of rotatory anode X-ray tube and discuss in detail about the parts. (20)

- 3A) Discuss in detail about the radioactive transformation processes with examples. (10)
- 3B) Discuss in details about different interaction process of photons with matter. (10)

- 4A) Discuss about the Line focus principle. (5)
- 4B) The half-life of radon is 3.82 days. After what time will the activity of sample of radon decay to $1/8^{\text{th}}$ of its original value. (5)
- 4C) Write a short note on Periodic table. (5)
- 4D) Discuss about the cobalt decay scheme with diagram. (5)
- 4E) Discuss about the properties of X-rays. (5)
- 4F) Define contrast and its dependent parameters. (5)

- 5A) What are continuous and characteristic X-rays? (2)
- 5B) Define isotope and isobar with example. (2)
- 5C) What is tube and filament current? (2)
- 5D) What is attenuation and define half value layer. (2)
- 5E) Define Inverse square law. (2)



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SECOND SEMESTER BSc. MRT DEGREE EXAMINATION - AUGUST 2017
SUBJECT: BMRT 106 - RADIATION QUANTITIES AND DETECTION
(2016 SCHEME)

Monday, August 21, 2017 (14.00 - 16.00 Hrs.)

Marks: 50

Duration: 120 mins.

Answer all the questions.

- 1) Write briefly about basic Principles of radiation detection. Explain working and construction of GM counter. (10)
- 2) Discuss in detail about dosimetric quantities with relevant expression and units. (10)
- 3A) Write a short note on semiconductor detector. (5)
- 3B) Write a short note on parallel plate chamber. (5)
- 3C) Write a short note on gamma zone monitor. (5)
- 3D) Define Radiation weighting Factor and Tissue weighting Factor. (5)
- 4A) Write advantages of using TLD detectors as personal monitoring device. (2)
- 4B) Explain p-type and n-type semiconductors. (2)
- 4C) What is Linear Energy Transfer and mention its unit. (2)
- 4D) Draw the characteristic curve of different regions of gas filled detectors. (2)
- 4E) What are the ideal characteristics of scintillating crystal? (2)