A **Reg. No. :** | | | | | | | | | | |

Question Paper Code: 99B09

B.E. / B.Tech. DEGREE EXAMINATION, NOV 2023

Elective

Biomedical Engineering

19UBM909- Medical Radiation Safety Engineering

(Regulation 2019)

Duration: Three hours Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 2 = 20 Marks)

1.	Define Half- life of radionuclide.	CO1- U
2.	Describe oxygen effect.	CO1- U
3.	Define Stochastic and Non-Stochastic Effects.	CO1- U
4.	Give a few syndrome and its dose ranges with different species.	CO1- U
5.	Give a short note on nuclear medicine and its application?	CO1- U
6.	Explain the functional mechanism of Positron Emission Tomography using schematic diagram	CO1- U
7.	Define ICRP.	CO1- U
8.	List out radiation protection in medical imaging and radiation oncology	CO1- U
9.	Define radiation hazards.	CO1- U
10.	What are the possible radiation accidents in medicine?	CO1- U

PART – C (5 x 16= 80 Marks)

11.	(a)	Give a brief note on atom, radiation and its characteristic features and analyse its various types?	CO1- U	(16)
		Or		
	(b)	Explain radioactive decay with an example. How do you differentiate electron capture type from other type of radioactive decay?	CO1- U	(16)

12.	(a)	Give a short note on Stochastic and Deterministic Effects. Review on the acute effects of total body irradiation and long term biological effects of ionizing radiations.	CO3- Ana	(16)
		Or		
	(b)	Define radiation doses. Review on various techniques employed for limiting radiation doses from radioactive medical equipment.	CO3- Ana	(16)
13.	(a)	Describe the history of radiology and Explain nuclear medicine, diagnostic and its therapeutic approach.	CO1- U	(16)
		Or		
	(b)	Brief note on radiation oncology and explain how brachytherapy approach is involved in the radioactive sealed sources for the cancer treatment.	CO1- U	(16)
14.	(a)	Define free radicals and G-value. Elaborate the principles of radiation protection in diagnostic radiology and the protection of employees or the public.	CO1- U	(16)
		Or		
	(b)	Give a brief comment on unintended and accidental medical exposures and the safety procedures for pregnancy and Magnetic Resonance Imaging system.	CO1- U	(16)
15	(a)	Describe radiation monitoring system. Which method or procedure can be suggested by you to measure or control radiation, exposure to staff and patients?	CO2- App	(16)
		Or		
	(b)	Can you explain radiation accidents in nuclear medicine? What kind of solution or prevention method can be given for the regulating of radioactive devices or components?	CO2- App	(16)