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Question Paper Code: 99B09

B.E. / B.Tech. DEGREE EXAMINATION, NOV 2022

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. Give a short note on Free Radicals and its impact on cell? CO1- U
2. Why oxygen is act as a well-known radio-sensitizer. CO3- Ana
3. Define Stochastic and Non-Stochastic Effects. CO1- U
4. Give a few syndrome and its dose ranges with different species. CO1- U
5. Differentiate high and low dose rate brachytherapy. CO1- U
6. Give a brief note on possible radiation accidents in medicine. 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 short note on Relative Biological Effectiveness of radiation particularly in DNA. Comparative analysis of radiation effect on differentiated and non-differentiated cells. CO3- Ana (16)
- Or
- (b) Give a brief note on radio-sensitizers. How do you examine natural or synthetic radio-sensitizers with an example? CO3- Ana (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 is more common to measure or control radiation, exposure to staff and patients? CO1- U (16)
- Or
- (b) Comment on waste disposal facilities. Explain radiation safety during source transfer operations, special safety features in accelerators. CO1- U (16)