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Question Paper Code: 99B09

B.E. / B.Tech. DEGREE EXAMINATION, MAY 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. 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)