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MPH 552

Fourth Semester M.Sc. Degree Examination, Sept./Oct. 2022

MEDICAL PHYSICS

Radiation Protection, Standards and Safety

Time : 3 Hours

Max. Marks : 70

- Instructions** : 1) Number the answers **properly**.
2) Answer **all** questions.
3) Give illustrations **wherever** necessary.

PART – I

Answer **any five** of the following.

(5×4=20)

1. What are stochastic and deterministic effects of radiation ?
2. Define ALI and DAC.
3. Define :
 - a) Workload
 - b) Use factor and
 - c) Occupancy factor in shielding calculation.
4. What are HVL and TVL ? Derive the relation between them.
5. Mention the sources of Radioactive wastes in medical facilities.
6. Differentiate between Type A and Type B packages.

PART – II

Answer **all** the **five** questions following **internal** choice.

(5×10=50)

7. a) What is the dose limit recommended by ICRP-60 for radiation workers and the general public ? Mention AERB recommended dose limits.

10

OR

- b) Explain the radiation protection standards and the principles in detail.

10

P.T.O.



8. a) i) Define internal radiation hazards. Explain radiotoxicities of various radioisotopes.

ii) What is bioassay ? **(7+3)**

OR

b) Explain the shielding calculation of 15MV LINAC with the line diagram and equations for barrier calculations. **10**

9. a) Explain the emergency situation likely to be occurring in a nuclear medicine department in detail. **10**

OR

b) Explain the scenario of radiation accidents in brachytherapy and its management. **10**

10. a) Describe the disposable procedure of solid and liquid radioactive waste of short and long lived radionuclide. **10**

OR

b) i) Explain in detail about category-III laboratory in medicine.

ii) What are the requirements for a category-III nuclear medicine laboratory in respect of staff, equipment and monitoring facilities ? **(6+4)**

11. a) Explain in detail about Type B packages. **10**

OR

b) What is TREM card ? What are the duties and responsibilities of RSO in radioactive source transport ? **10**
