Write short notes on:

1. Define radiation exposure, absorbed dose, effective dose and equivalent dose, with the units used to express them. 2.5x4

2. a) What is PACS?  
    b) Its usefulness in a large nuclear medicine department in a tertiary care hospital. 2+8

3. a) Chi Square test  
    b) Students ‘t’ test 5+5

4. a) Different types of crystals used in PET scanners.  
    b) What are the relative advantages and disadvantages of each? 5+5

5. What are different types of parent-daughter equilibrium? Illustrate with examples. 3+7

6. What is the role of phantoms in Nuclear Medicine? 3+4+3
   Enumerate the phantoms used in QC of SPECT, PET & CT. Describe the features of Jaszzczak Phantom.

7. a) Parts and functions of TLD.  
    b) How does a TLD differ from a film badge? 5+5

8. a) Reconstruction techniques in Nuclear Medicine imaging.  
    b) Geiger Muller Counters. 5+5

9. a) Factors affecting counting of radioactivity.  
    b) Categories of radioactive packages for transport. 5+5

10. a) Define half-life decay constant.  
    b) A radionuclide decays 1/4th of its activity in 3 hours and 40 minutes. Calculate the physical decay constant and physical half life (t½) of the radionuclide. 2+8

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