**[LS 120]** NOVEMBER 2020 **Sub. Code: 3016**

(OCTOBER 2020 SESSION)

**M.D. DEGREE EXAMINATION**

**BRANCH XXIV – NUCLEAR MEDICINE**

**PAPER I – BASIC SCIENCES AND INSTRUMENTATION IN NUCLEAR MEDICINE COMPUTERS AND MATHEMATICS IN NUCLEAR MEDICINE AND COMPARTMENTAL ANALYSIS**

***Q.P. Code: 203016***

**Time : Three Hours** **Maximum : 100 Marks**

**I. Write short notes on:** **(20 x 5 = 100)**

1. Secular & Transient equilibrium
2. Half life
3. Chemical bonds
4. Radio nuclide generator
5. Specific activity
6. Bremsstrahlung radiation
7. HPLC
8. Probability distribution
9. QC of PETCT
10. Thermal neutrons
11. Principles of nuclear reactor
12. Quantitative measurement of uniformity
13. PET mammography
14. SPECT phantom
15. PHA
16. Gated list mode data acquisition
17. Image file formats
18. Thyroid probe
19. Cardiac PET
20. Gas filled ionisation detectors

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**[MD 0721]** JULY 2021 **Sub. Code: 3016**

(MAY 2021 SESSION)

**M.D. DEGREE EXAMINATION**

**BRANCH XXIV – NUCLEAR MEDICINE**

**PAPER I – BASIC SCIENCES AND INSTRUMENTATION IN NUCLEAR MEDICINE COMPUTERS AND MATHEMATICS IN NUCLEAR MEDICINE AND COMPARTMENTAL ANALYSIS**

***Q.P. Code: 203016***

**Time : Three Hours** **Maximum : 100 Marks**

**I. Write short notes on:** **(20 x 5 = 100)**

1. Beta emitting radionuclides.
2. Half value layer.
3. Contamination monitor.
4. Gas Filled radiation detector.
5. Principles of PET Imaging.
6. Poisson distribution.
7. Paired t test.
8. Regression analysis.
9. ROC curve.
10. Design of a well counter.
11. Semiconductor detectors.
12. Basic design of a PET/CT Scanner.
13. Butterworth filter.
14. Application of compartment analysis in nuclear medicine.
15. Secular equilibrium.
16. Fourier transform.
17. Image display in nuclear medicine.
18. High energy collimator.
19. Pocket dosimeter.
20. Integral uniformity.

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**THE TAMIL NADU DR.M.G.R. MEDICAL UNIVERSITY**

**[MD 0522]** **MAY 2022** **Sub. Code: 3016**

**M.D. DEGREE EXAMINATION**

**BRANCH XXIV – NUCLEAR MEDICINE**

**PAPER I – BASIC SCIENCES AND INSTRUMENTATION IN NUCLEAR MEDICINE COMPUTERS AND MATHEMATICS IN NUCLEAR MEDICINE AND COMPARTMENTAL ANALYSIS**

***Q.P. Code: 203016***

**Time : Three Hours** **Maximum : 100 Marks**

**I. Write short notes on:** **(20 x 5 = 100)**

1. Various modes of radioactive decay.
2. Parameters for assessment of performance of a radiation detector.
3. Different types of collimators used in gamma camera imaging.
4. Properties of a gas-filled ionization detector.
5. Principles of PET data acquisition.
6. Poisson distribution.
7. Correlation coefficient.
8. Confidence interval.
9. Tests for co-registration of PET/CT.
10. Design of an intra-operative gamma probe.
11. Photomultiplier Tube.
12. Scintillation crystal.
13. Energy discriminator.
14. Properties of a survey monitor.
15. Components in the basic design of a SPECT/CT system.
16. Ramp filter.
17. Basic principle of compartment analysis.
18. Deconvolution in nuclear medicine imaging.
19. Fan beam collimator.
20. TLD badge.

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**THE TAMIL NADU DR.M.G.R. MEDICAL UNIVERSITY**

**[MD 0723]** **JULY 2023** **Sub. Code: 3016**

**(MAY 2023 EXAM SESSION)**

**M.D. DEGREE EXAMINATION**

**BRANCH XXIV – NUCLEAR MEDICINE**

**PAPER I – BASIC SCIENCES AND INSTRUMENTATION IN NUCLEAR MEDICINE COMPUTERS AND MATHEMATICS IN NUCLEAR MEDICINE AND COMPARTMENTAL ANALYSIS**

***Q.P. Code: 203016***

**Time : Three Hours** **Maximum : 100 Marks**

**I. Write short notes on:** **(20 x 5 = 100)**

1. Decay constant.
2. Neutron activation.
3. Principle of a cyclotron.
4. Attenuation coefficient.
5. Proportional counter.
6. PMT.
7. Poisson distribution.
8. Liquid scintillation spectrometry.
9. Cherenkov counting.
10. Gamma camera performance.
11. Iterative reconstruction Algorithm.
12. TOF PET.
13. Block detectors.
14. Partition coefficient.
15. Bateman equation.
16. TVT.
17. Decay by beta minus emission.
18. Inorganic scintillators.
19. Isomeric transition and Internal conversion.
20. Forces within the nucleus.