Nuclear Medicine – examination questions

A.

1. Radioactive decay, interaction of ionizing radiation with matter, fundamental quantities and units

2. Detection of ionizing radiation – types of detectors, their use in nuclear medicine (NM) for measurements in vitro and in vivo

3. Physical and technical principles of imaging instrumentation (devices) – SPECT, SPECT/CT, PET

4. Static and dynamic scintigraphy, tomography, fusion of images using hybrid cameras

5. Radiopharmaceuticals – definition, forms of pharmaceuticals, requirements for radiopharmaceuticals and quality control

6. Sources of radionuclides used in NM

7. Biological effects of ionizing radiation on human organism and relevant quantities and units

8. Principles of radiation protection of radiological workers

9. Principles of radiation protection of patients

B.

10. Nuclear pneumology – methods, principles of the methods, indication for scintigraphy, radiopharmaceuticals, clinical use

11. Perfusion pulmonary scan – principle of the method, radiopharmaceuticals, indication for scintigraphy, clinical use

12. Nuclear cardiology – perfusion study – principle of the method, radiopharmaceuticals, indication for scintigraphy, stress tests

13. Nuclear neurology – Brain perfusion SPECT, Neuroreceptor scintigraphy – examples of the receptors, static examination – indications, practical
14. Nuclear endocrinology – parathyroid scan, imaging of neuroendocrine tumors
15. Dynamic scintigraphy of kidneys – principle of the method, radiopharmaceuticals, indication for scintigraphy
16. Static renal scintigraphy – principle of the method, radiopharmaceuticals, indication for scintigraphy
17. Methods of nuclear nephrology – functional and scintigraphic imaging
18. Detection of infection/inflammation in NM
20. Nuclear methods in paediatry – sedation, pediatric dosing, differences in organ distribution
21. Nuclear oncology – radiopharmaceuticals, receptor analysis, tumor markers
22. Immunoscintigraphy – principle of the method, clinical use
23. Radioactive iodine in diagnosis and treatment of thyroid gland – Thyroid scan:, radioactive iodine uptake (RAIU)
24. Diagnostic scintigraphy with 99mTc-MIBI, 123I-MIBG, 111 In Octreoscan, clinical use
25. Therapy in nuclear medicine – Bone pain palliation, Radiosynoviorthesis