

General part:

1. Nuclei with the same atomic number but with a different number of neutrons are:
2. Nuclides with the same atomic mass (atoms + protons) are:
3. Two nuclides with the same number of neutrons are:
4. What is a β^- particle?
5. What does α particle consist from?
6. A high proton to neutron ratio favours: positron decay
7. A low proton to neutron ratio favours:
8. Positron interacts with electron in process called:
9. Interaction of positron with electron results in:
10. What proton to neutron ratio favours electron capture?
11. What is released from nucleus during isomeric transition?
12. What is the fundamental difference between x and γ rays?
13. What does "activity" mean
14. What is the SI unit of activity?
15. The specific activity means:
16. A radiopharmaceutical with a 6hours physical half life and a 3 hours biological half life has an effective half life:
17. What are the major emissions of ^{99m}Tc
18. What is the half life of ^{99m}Tc
19. What is the half life of ^{18}F
20. ^{99m}Tc decays in process of:
21. What is a gamma camera crystal made of?
22. What is a purpose of the crystal in gamma camera?
23. What is the mechanism by which γ rays interact with gamma camera crystal?
24. What is the most common type of collimator-hole alignment in nuclear medicine?
25. What is the purpose of collimator septa?
26. For the best resolution, how should a parallel-hole collimator be positioned relative to the patient?
27. ^{81}Kr is produced in:
28. ^{99m}Tc is produced in:
29. ^{18}F is produced in:
30. ^{131}I is produced in:

31. Nuclear reactor is used to:
32. Accelerator (linear or cyclotron):
33. The measure of the ability of the camera to separate events of different energies is called
34. The measure of the ability of an imaging system to distinguish two adjacent point sources as distinct is called
35. What is the relationship between effective $T_{1/2}$, physical $T_{1/2}$ and biological $T_{1/2}$?
36. What is the relationship between physical $T_{1/2}$ and decay constant λ ?
37. Which type of half life refers to the overall loss of radioactivity from the body due to physical and biologic decay?
38. The time required for a substance in the body to be reduced by half via biologic excretion or metabolism is called:
39. What does "metastable" mean?
40. The main technical problem of most positron emitters in PET radiopharmaceuticals is:

Conventional nuclear medicine

1. What biologically important ion Tl^{201} most closely mimic?
2. In perfusion lung scintigraphy, the tracer is localized by:
3. Bone scintigraphic agents are localized by:
4. Somatostatin analogues localize lesion by:
5. Diagnostic performances: what is the advantage of bone scintigraphy?
6. Diagnostic performances: what is the disadvantage of bone scintigraphy?
7. Diagnostic performances: in bone scintigraphy: clinical context and whole body pattern improve its:
8. What class of radiopharmaceutical compound is most commonly used for skeletal scintigraphy?
9. What two factors affect the degree of ^{99m}Tc -diphosphonate in the bone?
10. What is the critical organ for radiation dose in skeletal scintigraphy?
11. How child bone scan differs from adult bone scan?
12. What is the mechanism of increased bone scan uptake with a bone metastasis?
13. When can metastatic disease not cause the bone scan to be abnormal?
14. What is the typical scintigraphic pattern of metastatic disease?

15. What is a "flare" phenomenon?
16. How long does it usually take to flare phenomenon to normalize?
17. Which tumours commonly metastasize to bone?
18. What tumours tend to cause no bony reaction on a bone scan?
19. What is the typical indication for myocardial perfusion scintigraphy?
20. In myocardial perfusion scintigraphy, the tracer is
21. Physical or pharmacological stress in perfusion myocardial scintigraphy is used to
22. In myocardial perfusion scintigraphy: while performing synchronized study, the trigger of acquisition is
23. Thyroid and iodine:
24. Thyroid and pertechnetate:
25. Thyroid and ^{123}I
26. Thyroid and ^{131}I
27. What % of a dose of radioiodine is taken up by the thyroid of a euthyroid individual at 24 hour after administration?
28. When does the foetal thyroid begin to concentrate iodine?
29. What route is used to administer radioiodine?
30. What types of thyroid cancers can be visualised on radioiodine imaging?
31. Which tracer is most commonly used for parathyroid imaging?
32. How is gastrointestinal bleeding diagnosed using scintigraphy with $^{99\text{mTc}}$ -rbc?
33. What rate of bleeding can be detected with gi bleeding scintigraphy?
34. What volume of blood can be detected with gastrointestinal bleeding scintigraphy?
35. A currently used radiopharmaceutical what is excreted by the kidney and measures effective renal plasma flow is:
36. What non radioactive pharmaceutical is used to distinguish on obstructed dilated collection system from non-obstructed during radiorenography?
37. In non obstructed kidney the wash out half time on post furosemide renogram is
38. In obstructed kidney the wash out half time on post furosemide renogram is
39. In children, the most common site of renal obstruction is at the level of:
40. In adults, the most common site of renal obstruction is at the
41. What is the main indication for ventilation/perfusion scintigraphy?
42. What is the best organ to image to detect right-to-left shunting of $^{99\text{mTc}}$ -ma
43. What is the problem with administering too many particles of $^{99\text{mTc}}$ -ma?

44. What is the minimal number of particles of ^{99m}Tc-maa that should be injected for a perfusion scan?
45. How long after injection of ^{99m}Tc-maa can imaging for a lung perfusion scan begin?
46. Ventilation-perfusion mismatch refers to:
47. In a patient with a high pre-test probability of pulmonary embolism, the negative predictive value of v/p scintigraphy is
48. In a patient with a low pre-test probability of pulmonary embolism, the positive predictive value of v/p scintigraphy is
49. The probability of pulmonary embolism in patients with normal chest X rays, with matched defects of perfusion and ventilation is
50. The particles used for perfusion imaging are removed from lung by
51. Sentinel lymph node is:
52. In patient with fever of unknown origin (FUO), the preferred diagnostic modality should have following diagnostic performance:
53. The simplest way to reduce the radiation exposure to the bladder after a radionuclide renal study is by:
54. The kidneys receive approximately following % of cardiac output:
55. What is the preferred metabolic substrate of ischemic myocardium?

Positron emission tomography & radionuclide therapy:

1. Fluorodeoxyglucose ¹⁸F is an analogue of
2. ¹⁸F FDG is a marker of
3. ¹⁸F FDG and its metabolism
4. Fluorocholine ¹⁸F is a marker of
5. ¹¹C emits a positron
6. ¹⁸F FDG PET imaging & its diagnostic performances in oncology:
7. ¹⁸F FDG PET imaging & its diagnostic performances in infection/inflammation
8. Diagnostic performances of ¹⁸F FDG: FDG has a high:
9. Diagnostic performances of ¹⁸F FDG: FDG has a relatively low :
10. ¹⁸F FDG PET is physiologically taken up by
11. ¹⁸F FDG PET is eliminated by
12. ¹⁸F FDG PET is an optimal tool for staging

13. ^{18}F FDG PET may yield false negative results in case of
14. Physiological elimination of FDG creates an obstacle in correct evaluation of :
15. Which radiopharmaceutical is recommended for detection of hypoxic tumour tissue?
16. ^{18}F -fluoro-L-thymidine is a tracer of
17. ^{18}F -NaF is used for
18. ^{18}F - dihydroxyphenylalanine is an analogue of :
19. ^{18}F -dihydroxyphenylalanine is used for:
20. ^{68}Ga -DOTATOC is an analogue
21. ^{68}Ga -DOTATOC is used
22. ^{18}F fluoroethyl-L-tyrosine is an analogue
23. ^{11}C choline is a marker of
24. Which benign thyroidal condition is treated by ^{131}I :
25. ^{131}I and medullary thyroid carcinoma
26. Term: differentiated thyroid carcinoma refers to :
27. ^{90}Y & type of emitted radiation :
28. ^{131}I & type of emitted radiation :