1. Arrange the following media according to how they appear on an X-ray film from darker to lighter. *(soft tissue includes blood as well)*
   1. Fat, air, soft tissue, bone
   2. Bone, fat, soft tissue, air
   3. **Air, fat, soft tissue, bone**
   4. Air, soft tissue, bone, fat
   5. Air, fat, bone, soft tissue.
2. Regarding Doppler ultrasound:
3. Commonly used in evaluating arthritis .
4. It is considered ionizing radiation.
5. **It is very helpful in evaluation of blockage of blood flow.**
6. It is presented as series of slices of tissue .
7. It uses barium
8. Ultrasound is usually used in all the following except
   1. **Visualizing internal structure of bones and joints**
   2. Imaging the fetus in pregnancy
   3. Detecting gallstones
   4. Examining the heart and major blood vessels
   5. Viewing the liver.
9. Cardiac pacemaker is absolutely contraindicated in:
   1. **MRI**
   2. Ultrasound
   3. CT scan
   4. X-ray
   5. Nuclear medicine
10. Regarding to MRI:
    1. very sensitive to patient movement
    2. metallic objects should not be close to the machine
    3. relatively contraindicate in 1st trimester of pregnancy
    4. MRI images are more clearer and detail than US
    5. **all the above are correct**

1. Regarding arthropathies choose the correct statement:
2. Septic arthritis is a polyarthropathy.
3. In rheumatoid arthritis there is bone erosion that occur earlier in the hands than in the feet.
4. **Gout is often asymmetric monoarticular.**
5. In rheumatoid arthritis there is asymmetrical distribution.
6. Ankylosing spndyloitis is a monoartropathy
7. Features of Ankylosing spondylitis:
8. Asymmetric polyartropathy.
9. Spine changes.
10. Ankylosis giving bamboo spine.
11. Early erosion with irregular joint margins
12. **All of the above.**
13. Which of the following use ionizing radiation
14. X-ray radiography
15. CT scan
16. Ultrasound
17. **A and B**
18. A, B and C
19. Regarding Technetium 99m, all are correct except:
20. Has a half life of 6 hours
21. **Releases beta radiation**
22. Is not expensive
23. Is a radionuclide
24. Is used for diagnosis
25. All of the following are units used in nuclear medicine (old or new) EXCEPT:
26. Milicurie
27. Megabecquerel
28. Milirem (mrem)
29. **miliVolt (mV)**
30. milisieveret (msv)
31. The radiograph the humerus of a 19-year old male shows a lytic lesion that is well-defined and has a sclerotic rim. No periosteal reaction, no soft tissue expansion and no destruction of the adjacent cortex. The most likely diagnosis is:
    1. Osteomyelitis
    2. Primary malignant bone tumour
    3. **A benign fibrous cortical defect**
    4. A metastasized malignant tumour
    5. Multiple myeloma
32. some of the features of benign tumors and cysts include all the following except:
33. calcification in the matrix
34. no extension into sofe tissue
35. well defined margin
36. **periosteal reaction**
37. soft tissue swelling overlying joints is an early sign of
38. **rheumatoid arthritis**
39. trauma
40. malignant bone tumor
41. systemic sclerosis
42. MIBG scan used for which of the following neuroendocrine tumor:
43. paraganglioma
44. insulinoma
45. Metastatic neuroblastoma
46. **a and c**
47. The technique used in displaying imaging using an MRI doesn not only depend on proton density but also on two relaxation times. What can be said from these two basic types of iamges (T1 and T2):
48. T1-weighted has a low water signal intensity - high fat signal intensity, and T2-weighted has a low water signal intensity - low fat signal intensity
49. T1-weighted has a high water signal intensity - high fat signal intensity, and T2-weighted has a low water signal intensity - low fat signal intensity
50. **T1-weighted has a low water signal intensity - high fat signal intensity, and T2-weighted has a high water signal intensity - high fat signal intensity**
51. T1-weighted has a high water signal intensity - low fat signal intensity, and T2-weighted has a low water signal intensity - high fat signal intensity