Review Problem Set – MRI (Summer)

Part I. Answer the following questions by marking the best answer among the choices given [5 points each]:

1. The Larmor frequency of ^{19}F at 2T is …
    a) 40 MHz
    b) 80 MHz (*)
    c) 120 MHz
2. For MRI magnet with B0= 1T, the difference in Larmor frequency between the ^{1}H and ^{13}C is equal to:
    a) 42.6 MHz
    b) 31.9 MHz (*)
    c) 10.7 MHz
3. The size of a suitable room for an MRI system with B0= 1.5T and active shielding will be:
    a) 10m x 6m (*)
    b) 10m x 10 m
    c) 6m x 6m
4. MRI offer unique imaging of … that is not present in other methods.
    a) Anatomy
    b) Angiography
    c) Diffusion (*)
5. It is possible to obtain a signal from hydrogen nuclei in the body using MRI by …
    a) Sending an RF pulse at the Larmor frequency for Hydrogen (*)
    b) Changing the magnetic field B0
    c) Changing patient position

Part II. Mark the following statements as either True or False (3 points each):

1. Quenching is a dangerous event to happen for MRI systems. (T)
2. The more hydrogen atoms in the body the lower the MRI signal received. (F)
3. Open MRI systems are constructed using permanent magnets. (T)
4. MRI systems can be affected by elevators nearby in the building. (T)
5. Credit cards can be erased if present at the 5G line of an MRI system. (F)
6. A hospital worker with a pacemaker can still clean the MRI room. (F)
7. Hydrogen nuclei are at resonance when an RF pulse at their Larmor frequency is applied. (T)
8. Different nuclei have different Larmor frequencies due to their different gyromagnetic ratios (T)
9. Superconducting magnets offer the highest magnetic fields among all types. (T)

Important Note: Covered slides to study in MRI presentation are on pages: 3, 8, 72:78, 86:87.