Quiz Instructions

Choose the best answer for each question. You may look back at lectures and notes.

Question 1

F and Z are coefficients for

- Neither of these
- Longitudinal and Transverse bases, respectively
- Transverse and Longitudinal bases, respectively

Question 2

If the non-zero EPG coefficients are \( F^{-2} = i \) the equivalence magnetization is

- \( M_x = \cos(4\pi z), M_y = -\sin(4\pi z) \)
- \( M_x = -\sin(4\pi z), M_y = -\cos(4\pi z) \)
- \( M_x = \sin(4\pi z), M_y = \cos(4\pi z) \)
- \( M_x = \cos(4\pi z), M_y = +\sin(4\pi z) \)
Question 3

On EPG F and Z coefficients, the effect of relaxation (with E1 and E2 defined as previously) is to

- None of these
- Attenuate all F states by E2, all Z states by E1
- Attenuate all F states by E2, all Z states by E1, and add (1-E1) to Z0
- Attenuate all F states by E2, all Z states by E1, and add (1-E1) to all Z states

Question 4

The effect of a *negative* unit gradient on a non-zero state $F^+_1$ is to

- Refocus the magnetization to F0
- None of these
- Mix magnetization between states of order 1
- Dephase the magnetization to a 2nd-order state

Question 5

The rotation matrix due to precession in EPG takes the form

- $R = [\exp(i\theta) \exp(-i\theta) \exp(i\theta)] (\text{transpose})$
- $R = [\exp(i\theta) \exp(i\theta) 1] (\text{transpose})$
None of these

\[ R = [\exp(i\theta) \exp(-i\theta) \ 1] \text{ (transpose)} \]

**Question 6**

1 pts

If \( Z_2 = 0.25 + 0.25i \) then the longitudinal magnetization is

- 0.5\cos(2\pi z)-0.5\sin(2\pi z)
- 0.5\cos(2\pi z)+0.5\sin(2\pi z)
- 0.25\cos(2\pi z)-0.25\sin(2\pi z)
- 0.25\cos(2\pi z)+0.25\sin(2\pi z)

**Question 7**

1 pts

When magnetization passes from \( F^+ \) states to \( F^- \), then is refocused subsequently without passing through a Z state, this is

- a stimulated echo
- both spin echo and stimulated echo
- gradient spoiling
- a spin echo

**Question 8**

1 pts
When dephrased magnetization passes through a Z state, and is subsequently refocused, this is

- a spin echo
- both a spin echo and a stimulated echo
- gradient spoiling
- a stimulated echo

**Question 9**

To generate 2 cycles of twist in magnetization from an $F_0$ state you can

- apply a unit gradient and an RF pulse
- apply 2 unit gradients
- apply 2 RF pulses
- apply 2 RF pulses and a unit gradient

**Question 10**

The transverse EPG basis functions are best described as

- integer numbers of positive and negative twists (transverse magnetization) and integer numbers of sine/cosine cycles (longitudinal magnetization)
- integer numbers of negative twists (transverse magnetization) and integer numbers of sine/cosine cycles (longitudinal magnetization)
Integer numbers of positive twists (transverse magnetization) and integer numbers of sine/cosine cycles (longitudinal magnetization)

Integer numbers of positive and negative twists (transverse magnetization) and integer numbers of cosine cycles (longitudinal magnetization)