Week 6 Assignment

Due on 2020-03-11, 23:58 IST.

1. How is polarization transferred from 1H to 13C in 2D-HMQC?
   - Using the J-coupling between 1H and 13C
   - Using dipolar coupling between 1H and 13C
   - Using in-phase coupling between 1H and 13C
   - Using 90° pulses
   - No, the answer is incorrect.
   
   Accepted Answer:
   - Using the J-coupling between 1H and 13C
   
   1 point

2. Which of the following 2D experiment gives chemical shift correlation between a proton and a directly attached carbon?
   - 2D-TOCSY
   - 2D-HMQC
   - 2D-HNCACB
   - 2D-ROESY
   - No, the answer is incorrect.
   
   Accepted Answer:
   - 2D-HMQC
   
   1 point

3. Which of the following 2D experiments do not contain any diagonal peak?
   - 2D-COSY
   - 2D-HMQC
   - 2D-HNCO
   - 2D-ROESY
   - No, the answer is incorrect.
   
   Accepted Answer:
   - 2D-HMQC
   
   1 point

4. In a molecule acquired at natural abundance of 13C, which of the following will be least likely to occur and can be ignored?
   - proton-proton coupling
   - proton-carbon coupling
   - carbon-carbon coupling
   - carbon-proton coupling
   - No, the answer is incorrect.
   
   Accepted Answer:
   - proton-proton coupling
   
   1 point

5. Which of the following is true for 3D HMQC and 2D HMBC experiment?
   - In both the experiments, the same number of peaks are observed
   - In 3D HMQC, less time is required to record the 3D HMQC
   - In 2D HMBC, NOE is used but not in 3D HMQC
   - In 3D HMQC, long-range proton-carbon couplings are observed but not in 3D HMQC
   - No, the answer is incorrect.
   
   Accepted Answer:
   - In both the experiments, the same number of peaks are observed
   
   1 point

6. How many peaks will be observed in 2D HMQC spectrum of CH₃CH₂COCH₂CH₂?
   - 1
   - 2
   - 3
   - 4
   - No, the answer is incorrect.
   
   Accepted Answer:
   - 2
   
   1 point

7. How many peaks will be observed in 3D HMQC of CH₃COCH₂COCH₂?
   - 1
   - 2
   - 3
   - 4
   - No, the answer is incorrect.
   
   Accepted Answer:
   - 3
   
   1 point

8. How many peaks will be observed in 2D HMBC spectrum of CH₃CH₂COCH₃ if only two-bond 1H-13C J-couplings are expected?
   - 1
   - 2
   - 3
   - 4
   - No, the answer is incorrect.
   
   Accepted Answer:
   - 2
   
   1 point

9. For which of the following molecules, 2D HMQC will have some number of peaks as 2D HMBC, if the long-range 1H-13C J-couplings are removed till peak two-bonds?
   - CH₃CH₂CHO
   - CH₃COCH₂CHO
   - CH₃COCH₂CH₂
   - CH₃CH₂CHO
   - No, the answer is incorrect.
   
   Accepted Answer:
   - CH₃CH₂CHO
   
   1 point