**Reg. No. \_\_\_\_\_\_\_\_**

**Karunya University**

**(Karunya Institute of Technology and Sciences)**

(Declared as Deemed to be University under Sec.3 of the UGC Act, 1956)

**End Semester Examination – NOV / DEC - 2016**

**Subject Title: ANALYTICAL CHEMISTRY AND SPECTROSCOPY Time: 3 hours Subject Code: 12CH212 Maximum Marks: 100**

#### Answer ALL questions

**PART – A (10 x1 = 10 MARKS)**

1. Oxygen is unsuitable as a carrier gas for GLC. Why?
2. What is meant by partition coefficient?
3. 13C is NMR active, whereas 12C is not. Give reasons.
4. The 1H NMR spectrum of a compound C4H9Br consists of a single line. What could be its structure?
5. Define Singlet and triplet.
6. Define intersystem crossing (ISC).
7. What is meant by base peak?
8. Define parent ion?
9. Define Ewald’s sphere.
10. Write Bragg’s equation.

**PART – B (5 x 3 = 15 MARKS)**

1. Write a note on Rf value.
2. What is chemical shift?
3. Discuss fluorescence and phosphorescence with an example.
4. Give a short note on retro Diels – alder reaction.
5. Explain in short about electron density maps.

**PART – C (5 x 15 = 75 MARKS)**

1. a. Describe the principle and working of HPLC. (10)

b. Write down the application of column chromatography? (5)

(OR)

1. a. Explain the principle and application of ORD? (8)

b. Give a short note on axial haloketone rule with application. (7)

1. a. Describe with neat diagram the instrumentation of NMR spectroscopy. (8)

b. Explain the theory of spin-spin splitting with an example. (7)

(OR)

19. a. Discuss about the principle and applications of NMR spectroscopy. (8)

b. Define spin decoupling. Explain advantages. (7)

1. a. Briefly discuss about non-radioactive transition and radiodive transition by using Jablonski diagram. (10)

b. Give a short note on Flurescence confocal microscopy. (5)

(OR)

1. a. Discuss the principle and application of fluorescence correlation spectroscopy. (10)

b. Write the application of fluorescence resonance energy transfer. (5)

22. a. Illustrate about fragmentation expected and positive ion formation for esters. (8)

b. Discuss the McLafferty rearrangement. (7)

(OR)

1. a. How are organic molecules with aldehyde, ketone, alcohols as functional groups fragmented in mass spectroscopy? Explain. (9)

b. Give a note on nitrogen rule and meta stable ions. (6)

1. a. Discuss protein crystallography. (10)

## b. Explain Bragg’s equation with application (5)

## (OR)

25. a. Explain how a crystal structure is formed from electron density maps. (7)

b. Give a short note on isomophous replacement in solving crystal structure. (8)

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