

Day: Monday  
Date: 02-01-2017

Time: 10:00 AM TO 1:00 PM.  
Max. Marks: 60

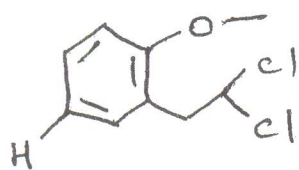
**N.B.:**

- 1) Attempt any **THREE** questions from Section -I and section -II each.
- 2) Figures to the **RIGHT** indicate full marks.
- 3) Answer to both the section should be written in **SEPARATE** answer books.
- 4) Draw neat diagrams **WHEREVER** necessary.

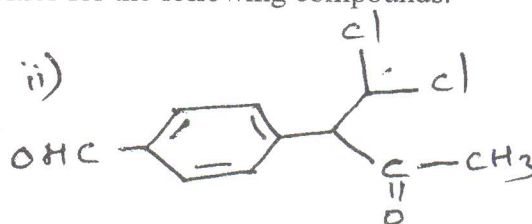
**SECTION-I**

**Q.1 a)** Assign the chemical shifts and multiplicities for the following compounds. (10)

i)

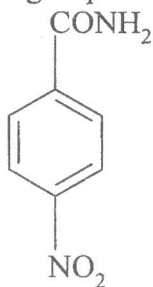


ii)

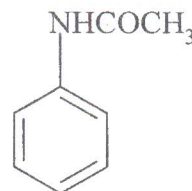


**b)** Assign the approximate range of IR frequencies to the vibrations corresponding to the functional groups in the following structures.

i)



ii)



**Q.2** Deduce the structure of a compound having following spectral data: (10)

Molecular formula  $C_7H_9N$

IR ( $cm^{-1}$ ): 3341, 1610, 1525, 1451

$^1H$ NMR ( $\delta$  ppm): 6.98, (m, 5H), 4.1 (s, 1H), 1.5 (s, 3H)

**Q.3** Discuss the instrumentation of GLC in detail with suitable diagram (10)

P. T. O.

- Q.4** Write elaborate note on: **(10)**
- a) Applications of HPTLC
  - b) LC- MS- MS

**SECTION-II**

- Q.5** Write an exhaustive note on ELISA. **(10)**
- Q.6** Write a brief note on super critical fluid chromatography. **(10)**
- Q.7** Discuss the instrumentation and applications of DSC. **(10)**
- Q.8** Write an elaborate note on: **(10)**
- a) Applications of XRD
  - b) Applications of TGA

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Day : *Wednesday*  
Date : *04-01-2017*

Time : *10:00 AM TO 1:00 P.M.*  
Max. Marks : 60

N.B.

- 1) Attempt any **THREE** questions from Section – I and Section – II each.
- 2) Answers to both the sections should be written in **SEPARATE** answer books.
- 3) Figures to the right indicate **FULL** marks.

### SECTION - I

- Q.1 What is Research? What are the objectives of Research? Comment on various types of research. (10)
- Q.2 Explain plagiarism and methods to avoid plagiarism. (10)
- Q.3 What do you understand by quality by design (QBD) and explain how it can be effectively implemented? (10)
- Q.4 Write elaborate notes on any **TWO** of the following: (10)
- a) Essential components of research paper
  - b) Interview method of research
  - c) Selection of research problem

### SECTION – II

- Q.5 Describe the bio-screening of anti arrhythmic drugs. (10)
- Q.6 Describe the guidelines for acute toxicity testing in animals. (10)
- Q.7 Two groups of 100 patients each were included in clinical trial of anti HIV drug. The drug was ineffective in 15 patients in first group and 25 patients in other group. Test the effectiveness of Anti HIV drug. (Use 5% LOS) (10)
- Q.8 Write elaborate notes on any **TWO** of the following: (10)
- a) Factorial design
  - b) Linear regression
  - c) Non parametric tests