

CHE-504

Spectroscopy, Computers and Mathematics, Biology

M.Sc. CHEMISTRY (MSCCH - 12/13/16/17)

First Year, Examination-2019

Time: 3 Hours

Max. Marks: 80

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Note:- This paper is of Eighty (80) marks divided into two (02) Section A and B. Attempt the question contained in these sections according to the detailed instructions given therein.

Section-A

(Long Answer Type Question)

Note:- Section - A contains five (05) long answer-type questions of fifteen (15) marks each. Learners are required to answer any three (03) questions only. (3×15=45)

1. Discuss the principle and applications of NMR spectroscopy in structure determination of organic compounds.

2. Explain electronic spectroscopy. Establish relationship between wavelength, frequency and wave number. Discuss its absorption range.
3. Discuss the principle of IR spectroscopy. How will you distinguish between the following pairs of compounds on the basis of IR spectroscopy:
- (i) Ethyl alcohol and diethyl ether
 - (ii) Acetic acid and ethyl acetate
4. Discuss function, structure and types of Nucleic acid.
5. (i) Find the inverse of matrix

$$A = \begin{bmatrix} 1 & 3 & 3 \\ 1 & 4 & 3 \\ 1 & 3 & 4 \end{bmatrix}$$

- (ii) $y = x^2 \sec x$, find dy/dx
- (iii) Find the distance between the points (2, 3) and (5, 4)

Section-B

(Short Answer Type Question)

Note:- Section-B contains eight (08) short answer type questions of seven (07) marks each. Learners are required to answer any five (05) questions only. (5×7=35)

1. How does hydrogen bonding affect the absorption frequency in IR – spectrum.
2. Explain Red and Blue shift.
3. Explain chemical shift. Discuss the factors affecting the chemical shift.
4. Differentiate between DNA and RNA.
5. Discuss basic language of computer and its application in chemistry.

6. How will you convert glucose into fructose?
7. Write a note on finger printing region.
8. Write equivalent and non – equivalent protons in nmr spectroscopy.
