

B.Sc. Semester - 6 (CBCS) Examination

March/April-2024 (OLD COURSE)

ORGANIC CHEMISTRY AND SPECTROSCOPY(CORE)

Time: 2:30 Hours

Marks: 70

Instructions:

1. All questions are compulsory.
2. Figures to the right indicate marks.

- Q. 1 (A) Answer the following question. (04)**
 (1) Explain amino acids, essential and non-essential amino acids and name types of classifications based on nature and functional group.
- Q. 1 (B) Answer the following questions. (Any two) (10)**
 (1) Write any two methods of synthesis of amino acids.
 (2) Write Bergmann method for the synthesis of polypeptide.
 (3) Explain classification of protein briefly.
- Q. 2 (A) Answer the following question. (04)**
 (1) What are terpenoids? Give general characteristics and write isoprene rule.
- Q. 2 (B) Answer the following questions. (Any two) (10)**
 (1) Write reactions to prove presence of two double bonds and a carbonyl group in citral.
 (2) Give synthesis musk Ambrette and TNT.
 (3) Give synthesis and uses of carbendazim
- Q. 3 (A) Answer the following question. (04)**
 (1) Explain polynuclear aromatic hydrocarbons. Give one synthesis and one substitution reaction of diphenyl.
- Q. 3 (B) Answer the following questions. (Any two) (10)**
 (1) Write a method of synthesis and any two reactions of naphthalene.
 (2) Write a method of synthesis and any two reactions of anthracene.
 (3) Give synthesis of indole by Fischer method.
- Q. 4 (A) Answer the following question. (04)**
 (1) Differentiate NMR spectrum of (A) Ethanol and (B) Diethyl ether.
- Q. 4 (B) Answer the following questions. (Any two) (10)**
 (1) Differentiate: Chemical shift δ and coupling constant j .
 (2) Write a note on Anisotropic effect in NMR
 (3) Explain factors affecting chemical shift of proton in NMR .
- Q. 5 (A) Answer the following question. (04)**
 (1) What is mass spectrometry? Explain base peak, molecular ion.
- Q. 5 (B) Answer the following questions. (Any two) (10)**
 (1) Write a note on boat, chair and twist boat conformations of cyclohexane.
 (2) Discuss IR and NMR spectra of acetone, acetamide and acetylchloride.
 (3) A molecule having M.F- $C_6H_{12}O$, gives NMR:
 a) singlet-1.1 δ 17.89 sq.
 b) singlet-2.2 δ 5.95 sq. and IR: 2951, 2870, 1716, 1390, 1366 cm^{-1} . Deduce constitution.

Spectral data

NMR	IR
NMR: δ values	IR:
0.9-1.2 Alkyl groups	3100-3000 C-H stretching arenes
2.0-2.5 Ar-R groups,	2900-3000 C-H stretching alkanes,
2.0-2.5 CO-R,	1650-1750 CO str
6-8 Ar-H	1380-1350 C-H stretching isopropyl/tert.butyl