

B.Sc. Semester - 5 (CBCS) Examination
Oct/Nov - 2025 (NEW 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.

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| Que.1(A) | Answer the following question. | (04) |
| | (1) Give synthesis and uses of Dulcin. | |
| Que.1(B) | Answer the following questions. (Any two) | (10) |
| | (1) What is α -amino acid? Explain acidic, basic and neutral amino acids. | |
| | (2) Explain Erlenmeyer azlactone synthesis. | |
| | (3) Give difference between enantiomers and diastereomers. | |
| Que.2(A) | Answer the following question. | (04) |
| | (1) Explain LAH reduction of carbonyl compounds with one example. | |
| Que.2(B) | Answer the following questions. (Any two) | (10) |
| | (1) Write reactions only for the synthesis of Nicotine by any one method. | |
| | (2) Construct multiplication table for C_{2h} symmetry point group. | |
| | (3) Give difference between σ_h , σ_v and σ_d symmetry planes. | |
| Que.3(A) | Answer the following question. | (04) |
| | (1) Write a note on characteristics of mass spectra of alkanes. | |
| Que.3(B) | Answer the following questions. (Any two) | (10) |
| | (1) Give classification of drugs based on therapeutic effect with one example for each. | |
| | (2) What is anisotropic effect? Explain anisotropic effect with suitable examples. | |
| | (3) Write factors affecting chemical shift in PMR spectroscopy. | |
| Que.4(A) | Answer the following question. | (04) |
| | (1) Explain Enantiotopic and Diastereotopic protons w.r.t. PMR. Spectroscopy. | |
| Que.4(B) | Answer the following questions. (Any two) | (10) |
| | (1) Write general method of proving presence of (any three) functional groups in alkaloids. | |
| | (2) Write synthesis of Conine. | |
| | (3) Write differences between δ and j in NMR. | |
| Que.5(A) | Answer the following question. | (04) |
| | (1) Define various ions formed in mass spectrometry. | |
| Que.5(B) | Answer the following questions. (Any two) | (10) |
| | (1) Write short note on conformations of cyclohexane. | |
| | (2) Write five reactions of amino acid due to amine functional group. | |
| | (3) Answer the following questions as directed. | |

- a) Write number of possible PMR signals with multiplicity for molecule a.
- b) Write only number of PMR signals for molecules b, c and d.


