



Sample Paper - Entrance Test for Admission to Doctor of Philosophy

Discipline: Applied Science (Chemistry)

Max Time: 3 Hours

Total Marks: 100

There are two sections each of 50 Marks in this Paper

Section 1: Chemistry Descriptive Questions		
1.	a). Discuss different methods for generation and stability of following reactive intermediates. (1). Free radicals (2). Carbocations (3). Nitrenes OR a). Give Reaction, Mechanism and Applications (Only two) of following: (1). Pinacol – Pinacolone (2). Curtius Rearrangements	[20]
2.	b). (1). Give one synthesis and any two reactions of : i) Imidazole ii) Pyrimidine. (2). Give reaction and mechanism of Paal – Knorr synthesis of Pyrrole. OR b). (1). What are CIP rules? By giving suitable example (only one example) explain how these rules are used to determine the R/S configuration. (2). Discuss the stereochemistry of Allenes and Spirans.	[20]
3.	c). Discuss Mechanism of Unimolecular Nucleophilic Substitution reaction (S_N^1) in detail. OR c). Explain Aromaticity and give the details of Huckel Molecular Orbital theory.	[10]

Section 2: Research Methodology Descriptive Questions		
1.	a). What is Research? Enlist different types of research. Explain <i>Applied vs Fundamental</i> research in detail. OR a). What points will you keep in mind while preparing a research report? Explain	[20]
2.	b). Write a short note on: "Computers and Researchers". OR b). Explain the technique and importance of oral presentation of research findings.	[20]
3.	What are different sections of the thesis writing?	[10]