Instructions:

(1) Fill up strictly the details of signs on your answer book.
   Seat No.:

(2) Figures to the right indicate full marks of the questions.

1. Answer any THREE of the following: [18]
   (a) Discuss the Chromophore-Auxochrome theory regarding colour and
       Chemical constitution.
   (b) Discuss the classification of dyes based on methods of application.
   (c) Discuss the resonance theory regarding the colour and Chemical
       constitution.
   (d) Explain Bathochromic and Hypsochromic effect.

2. Answer any THREE of the following: [18]
   (a) Explain the factors affecting on drug action. Discuss the occupancy
       theory.
   (b) Name the different routes of drug administration and give the factors
       affecting drug absorption.
   (c) What are drugs? Give the classification of drugs on the basis of their
       therapeutic action.
   (d) Discuss briefly biological defense and chemical defense.
3. Answer any **THREE** of the following:  

(a) Give the method of preparation of NBS. Explain the role of NBS in the following giving mechanism:
   (i) Allylic bromination  
   (ii) Conversion of retinol to dehydroretinol  
   (iii) Benzyllic bromination in the formation of:
   - 1-bromo-1-phenyl butane, 1-bromo methylnaphthalene,  
   - 3-bromo methylthiophene  
   (iv) Degradative oxidation of α- hydroxyl and α-amino acid.

(b) Describe Raney’s process. Discuss the role of Raney nickel in organic synthesis.

(c) Give two methods for the preparation of diazomethane. Discuss the role of diazomethane in the following organic synthesis giving mechanism:
   (i) Pyrazole and pyrazoline (ii) Dimethyl aniline  
   (iii) Cyclohexanone (iv) Naphthyl acetic acid

(d) Give the methods of preparation of DCC. Discuss the role of DCC in the synthesis of amides, heterocyclization, Moffatt oxidation and dehydrative coupling reaction.

4. Answer any **THREE** of the following:  

(a) Give the method for preparation of DDQ and its uses in benzylic oxidation, oxidation of phenols, aromatization and in synthesis of α-β-unsaturated ketones.

(b) Explain the term proprietary and nonproprietary names of drugs. Give the rate theory for drug action.

(c) Define dye. How will you differentiate dyes and pigments? What are the prerequisites for a dye? Discuss the limitations of quinonoid theory.

(d) Give the method of preparation of trifluoroacetic acid. Discuss any four synthetic applications of trifluoroacetic acid in organic synthesis.