

**RAMAKRISHNA MISSION VIDYAMANDIRA**  
(Residential Autonomous College affiliated to University of Calcutta)

FIRST YEAR [2019-22]

B.A./B.Sc. FIRST SEMESTER (July – December) 2019

Mid-Semester Examination, September 2019

Date : 18/09/2019

Time : 11 am – 12 noon

**CHEMISTRY (General)**

Paper: I

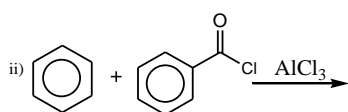
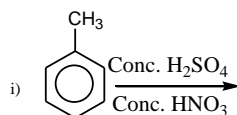
Full Marks : 25

Answer **any five** questions:

(5 × 5)

1. a) Predict the products for the following reaction with mechanism.

[2×2]

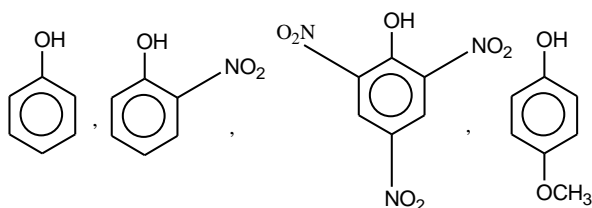


- b) "Phenol is acidic in nature" — explain the above statement.

[1]

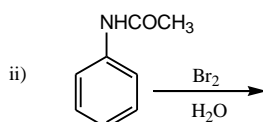
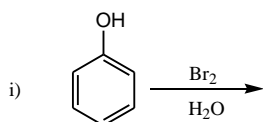
2. a) Arrange the following molecules in increasing order of acidity with explanation.

[3]



- b) Predict the products for the following reactions, (No mechanism needed)

[2]

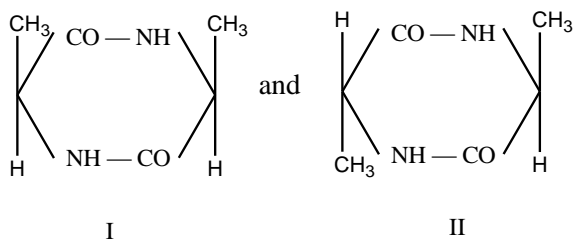


3. Between the following two isomers. Find out

- a) Which one is optically active and why?

- b) Which one is optically inactive and why?

- c) Mention the symmetry element present in the optically inactive molecule and define it. [1.5+1.5+1.5+1.5]



4. Draw the molecular orbitals of  $N_2$ ,  $O_2$ . Account for the qualitative difference between the two diagrams (if any).

[(1.5+1.5)+2]

5. a) In a schematic diagram (known as Born Haber cycle) show how the formation of an ionic crystal from the atoms involve contribution of a number of different energy functional. [3]  
b) Mention which of these energy terms are positive and which are negative. [2]
6. a) Discuss the preparation structure and bonding of Diborane. [3]  
b) Comment on the oxidation state of Tl. [2]
7. a) Aqueous sol<sup>n</sup> of Comp.(A) Gives white ppt(B) when AgNO<sub>3</sub> and HNO<sub>3</sub> are added. The compound (B) is soluble in NH<sub>4</sub>OH. Aqueous sol<sup>n</sup> of (A) gives a white gelatinous ppt (C) when excess solid NH<sub>4</sub>Cl and few drops of NH<sub>4</sub>OH are added. Identify (A),(B) and (C) [3]  
b) Mention the hybridisation and geometry of CO<sub>2</sub>. [2]
8. What is Chelate complex and first order Inner metallic complex? Give example of each. [1.5+1.5+1+1]

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