**Q1 /**From toluene prepare *m*-bromo benzoic acid. **Q2 /**What does Sandmeyer reaction mean? Use chemical equations to explain this.

**Q3/** Draw the structure for each of the following compounds: **i.** Aspirin

**ii.** Salicylic acid **iii.** Acetic acid **iv.** Acetic anhydride **v.** Benzanilide.

**Q4/** Arrange the following compounds according to increase their:

**1)** Boiling points: Ethanoic acid, Ethanol, Water

**2)** Basicity: Aniline, Benzamide, RNH2

**3)** Reactivity toward nitration reaction: Benzene, Methyl benzoate, Phenol

***Q5/*** Write the detail mechanism for benzamide hydrolysis in basic medium.

***Q6/*** Write the suitable product for the reaction of (NaNO2/HCl) with each of the following compounds:

**1)** PhNH2  **2)** Ph2NH **3)** Ph3N **4)** R3N

***Q7/*** What are the differences between each of the following

compounds:-

1)Nitronium & nitrosonium ion.

2)Classical & non- classical ion.

***Q8/***From aniline prepare a/p-nitro benzoic acid.

b/ m-nitro benzoic acid.

***Q9/*** Write the detail mechanism for preparing aspirin .

***Q10/*** What is the difference between the product of the reaction of α-

and β- naphthol with diazonium salt?

***Q10/*** Write all equations for Sand Meyer reaction.

***Q11/*** Disclose the difference in behavior between aldehydes/ketones

and carboxylic acid derivatives toward nucleophilic substitution

reactions. (Chemical reaction)

***Q12/*** Arrange the following compounds according to reactivity toward

nucleophilic substitution reaction.

CH3COOEt, CH3CH2COCl, CH3(CH2)3CONH2, MeCO-O-Me.

***Q13/*** Complete the following equations :-

1. Phenol + HNO3/ H2SO4 
2. 2-Naphthol + NaNO2/ HCl 
3. Benzamid + H2O/ HCl 
4. Aniline + benzoyl chloride 
5. Nitrobenzene + 6Fe(OH)2 + 4H2O 

***Q14/*** Arrange the following compounds according to increase their:-

1. **Rate of nitration reaction:-**



1. **Bascity :-**



***Q14/*** What are the differences between each of the following

compounds:-

1)Nitronium & nitrosonium ion.

2)Classical & non- classical ion.

***Q15/***Write the reaction of alcoholysis of carboxylic acid derivatives

***Q16/***Write the reaction of aminolysis of carboxylic acid derivatives

***Q17/***Write the applications of amide in different fields.

***Q18/*** What are the differences between amide & analide.

***Q19/*** Why m- nitro benzamide is a major product for nitration of benzamide

***Q20/*** Count the reactions of dizonium salt and give an example for each one.

***Q21/*** What is the effect of donating &withdrawing groups on the speed of the

nitration process?

***Q22/***  What is the product of nitration of nitrobenzene? why?

***Q23/***  What is the product of nitration of chlorobenzene? why?

***Q24/*** What are the forms of diazonium salt and for which salt reaction is it used?

***Q25/*** In what formula are carboxylic acids present? What does this formula give

them?