

Duration: 3 Hours

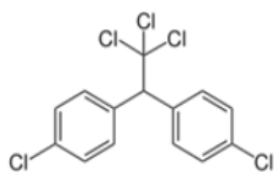
Total Marks: 75

- N.B. : 1. All questions are compulsory**  
**2. Figures to right indicate full marks**

**Q. 1 Choose appropriate option for following multiple choice based questions. 20**

- 1 \_\_\_\_\_ are triesters of long chain saturated fatty acids with glycerol.  
a Waxes  
b Oils  
c Fats  
d Lipid
- 2 In the nitrating mixture, the  $\text{HNO}_3$  acts as \_\_\_\_\_ and the  $\text{H}_2\text{SO}_4$  acts as \_\_\_\_\_.  
a A base, an acid  
b An acid, a base  
c Source of nitronium ion, a catalyst  
d Source of nitronium ion, strong acid
- 3 Reaction of cyclopropane with bromine in dark and in presence of  $\text{CCl}_4$  forms  
a 1,4-dibromopropane  
b 1,2,3-tribromopropane  
c 1,2-dibromopropane  
d 1,3-dibromopropane
- 4 Halogens are ortho/para director for electrophilic aromatic substitution due to  
a Inductive effect  
b Resonance effect  
c Steric effect  
d Electronegativity
- 5 In a butter, triglyceride upon hydrolytic rancidity liberates  
a Myristic acid  
b Oleic acid  
c Caproic acid  
d Palmitic acid
- 6 Which entity from the following is abstracted by the base from the intermediate in electrophilic aromatic substitution:  
a  $\text{H}^+$   
b  $\text{H}^-$   
c  $\text{H}^-$   
d Benzenium ion
- 7 Which of the following is cyclic fatty acid?  
a Cerebronic acid  
b Ricinoleic acid  
c Chaumoorgic acid  
d Oleic acid

8 The given structure is \_\_\_\_\_ and is used as \_\_\_\_\_

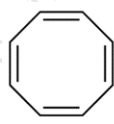


- a Chloramine, disinfectant
- b DDT, pesticide
- c Saccharin, sweetener
- d BHC, agricultural insecticide

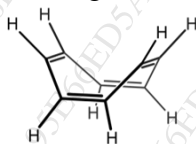
9 Baeyer's strain theory is valid for all, except

- a Cyclohexane
- b Cyclopentane
- c Cyclobutane
- d Cyclopropane

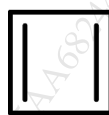
10 Predict which of the following molecules is non aromatic?



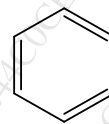
i



ii



iii



iv

- a i
- b ii
- c iii
- d iv

11 Identify the correct example of an omega 3 fatty acid

- a Stearic acid
- b Myristic acid
- c Linoleic acid
- d Lauric acid

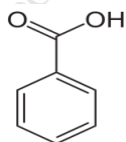
12 \_\_\_\_\_ can be used to convert  $-\text{COOH}$  to  $-\text{CH}_2\text{OH}$

- a Catalytic hydrogenation
- b  $\text{LiAlH}_4$
- c  $\text{NaBH}_4$
- d  $\text{Sn}/\text{HCl}$

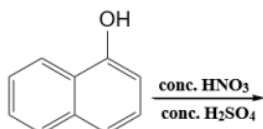
13 When Naphthalene reacts with  $\text{CH}_3\text{COCl}/\text{AlCl}_3$  in presence of  $\text{CS}_2$ , ----is formed

- a 1-Acetyl naphthalene
- b 2-Acetyl naphthalene
- c 1-methyl- naphthalene
- d 2-methyl- naphthalene

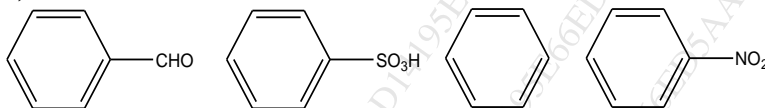
- 14 Aminobenzoic acids are \_\_\_\_\_ benzoic acid
- Stronger acids than
  - Weaker acids than
  - As acidic as
  - Cannot be compared
- 15 Order of reactivity of Benzene, naphthalene, anthracene and phenanthrene towards Electrophilic Aromatic Substitution Reactions is: -
- Benzene < naphthalene < anthracene < phenanthrene
  - Benzene > naphthalene > anthracene > phenanthrene
  - Benzene < naphthalene < anthracene < phenanthrene
  - Benzene > naphthalene > anthracene and phenanthrene
- 16 The probable starting material for the synthesis of o-Toluic acid could be
- p-Toluidine
  - o-Toluidine
  - m-toluidine
  - o-Anisidine
- 17 Decalin is obtained on reduction of naphthalene using \_\_\_\_\_
- Na/EtOH
  - Na/Isoamyl alcohol
  - H<sub>2</sub>/Ni
  - NaBH<sub>4</sub>
- 18 According to Coulson-Moffitt model, the C-C-C bond angle in cyclopropane is
- 90 degree
  - 109.5 degree
  - 104 degree
  - 60 degree
- 19 The given compound cannot be used as \_\_\_\_\_



- Plasticizers.
  - Food preservatives.
  - Whitfield's ointment
  - Blood thinner
- 20 Predict the product of the following reaction?



- 4-Nitro 1-naphthol
- 8-Nitro -1-naphthol
- 4-Nitro 2-naphthol
- 8-Nitro 2-naphthol

**Q. 2 Answer any TWO questions****20****1. a)****10**

For the above given four molecules,

- Arrange the molecules in increasing order of reactivity towards electrophilic aromatic substitution and justify the order.
  - Identify which of the above molecules will readily undergo electrophilic aromatic substitution. Depict the mechanism of sulphonation for it.
  - Select an appropriate molecule from above as the starting material to synthesize acetanilide. Give the reactants and reaction conditions for it.
- b)** State the limitations of Baeyer's angle strain theory. Discuss Coulson and Moffitt's modification with suitable example.
- a)** Compare the reactivity of naphthalene with benzene. Explain electrophilic aromatic substitution in naphthalene. Discuss sulphonation reaction of naphthalene. **10**

**b)** Discuss in detail Kolbe's reaction and Reimer Tiemann's reaction.
  - a)** Comment on the orientation and reactivity of the -Cl and -OH group towards electrophilic aromatic substitution. **10**

**b)** What is hydrogenation of oil? Explain what trans fats are and how they are unhealthy?

**Q. 3 Answer any SEVEN questions****35**

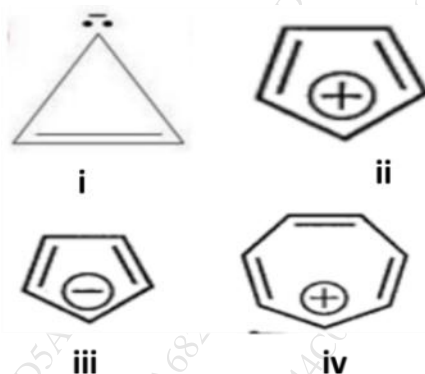
- What is Baeyer's strain? Explain why does cyclopropane undergo ring opening reactions radially? **5**

Match the following with their respective profile.

A) Butterfly conformation	A) Banana bond
B) Cyclopropane	B) Sachse Mohr
C) Boat conformation	C) Cyclobutane
D) Strainless rings	D) Cyclohexane

- Define drying oil and enlist one example. Write the structure and uses of diphenyl methane, Triphenylmethane and Triphenylcarbinol. **5**
- Give the mechanism and synthetic utility of the Friedel Crafts reaction. Predict whether phenol, benzoic acid and aniline easily undergo this reaction. **5**
- Explain the term rancidity and saponification value. Discuss the different types of rancidity with reactions involved in it. **5**
- Discuss the steps involved in the Azo-coupling reaction. Give the significance of pH in this reaction. Give the uses of Azo compounds. **5**

6. Explain the terms RM value and acetyl value with the principle and significance 5 involved in their determination.
7. Identify whether following compounds are aromatic, antiaromatic or 5 nonaromatic.



With the help of suitable structures and examples, explain why aromatic amines are less basic than aliphatic and cycloaliphatic amines.

8. Give the products obtained on the reaction of the following reagents with 5 nitrating mixture. i) Ethyl benzene ii) Benzene nitrile iii) Benzoic acid iv) Anisol v) Acetanilide.
9. Which is the preferred position for electrophilic substitution in an anthracene? 5 Justify. Predict the product/s of the following reaction:
- i. Anthracene +  $K_2Cr_2O_7 / H_2SO_4$
  - ii. Anthracene +  $Br_2 / CCl_4$  at low temp
  - iii. Phenanthrene +  $Na / C_2H_5OH$

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