

RAMAKRISHNA MISSION VIDYAMANDIRA

(Residential Autonomous College affiliated to University of Calcutta)

B.A./B.Sc. FIFTH SEMESTER EXAMINATION, DECEMBER 2016

THIRD YEAR [BATCH 2014-17]

INDUSTRIAL CHEMISTRY [Honours]

Date : 19/12/2016

Time : 11 am – 1 pm

Paper : V [Gr- B]

Full Marks : 50

[Use a separate Answer Book for each Unit]

Unit – I

(Answer any four questions)

[4×5]

1. What are point & non-point sources of water pollution? Define photochemical smog. What do mean by Volatile Organic Compounds? [2+1+2]
2. Why did the Flixborough Disaster take place? Name the major compound which was the key-factor behind Bhopal Gas Tragedy. Briefly illustrate the importance of a Biosensor. [2+1+2]
3. State in which way a sanitary landfill differs from other landfill processes. Give a brief account of Pyrolysis and Gasification process used for solid waste management. What are the advantages of this process over incineration procedure? [1+2+2]
4. Enumerate the factors responsible for stratospheric ozone depletion. Give an account of the heterogeneous reactions leading to the formation of ozone hole. [2+3]
5. Distinguish between Advection & Percolation. Mention the major sources of Dissolved Oxygen in water. What is Chemical Oxygen Demand? How can it be measured? [2+1+1+1]
6. Describe the Activated Sludge Process in Secondary Treatment. Briefly enumerate the importance of Tertiary Treatment. [3+2]
7. Distinguish between good ozone and bad ozone. State with suitable chemical reactions how bad ozone is formed in urban areas. [2+3]

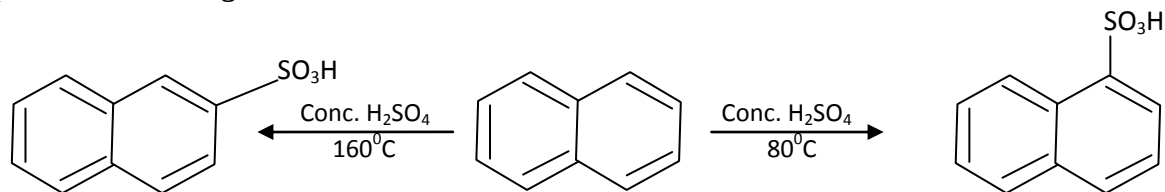
Unit – II

(Answer any six questions)

[6×5]

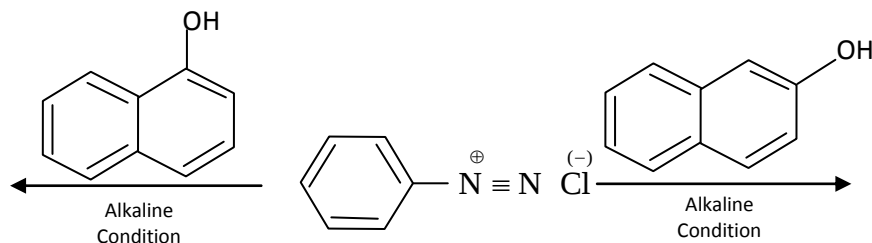
8. a) Draw the potential energy versus dihedral angle diagram for *n*-butane providing the gauche, anti and eclipsed conformation.
b) Draw the stable conformation of cis-1,4-ditertiarybutylcyclohexane with proper reason. [3+2]
9. a) Draw the Flying-Wedge formula of meso-tartaric acid and convert it to Newman Projection formula.
b) Between chair and boat form of cyclohexane which one is more stable and why?
c) Identify the difference between the terms “configuration” and “conformation”. [2+2+1]
10. a) Indicate the limitations of Bayer strain theory with proper reasoning.
b) Cis-1,2-dimethylcyclohexane is optically inactive. Explain. [3+2]

11. a) Explain the following observation.



b) Write down the products of the following reactions:

[3+2]



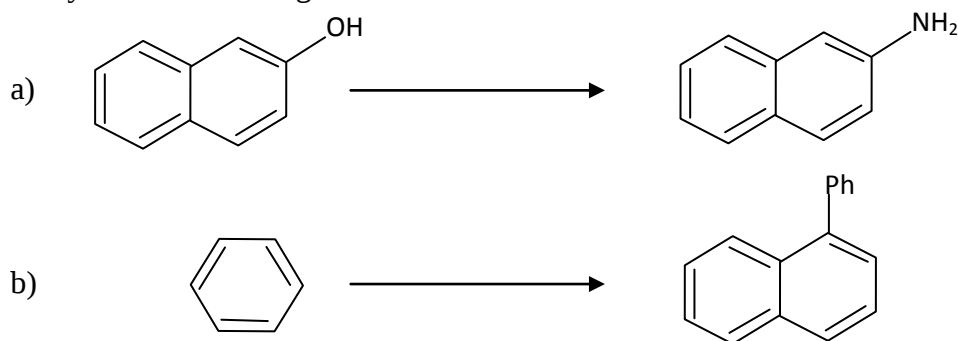
12. a) Describe Bardhan-Sengupta synthesis of phenanthrene in details.

b) Explain why 9,10 positions of anthracene is more susceptible to electrophilic attack?

[3+2]

13. Carry out the following conversion with details mechanism.

[2½×2]



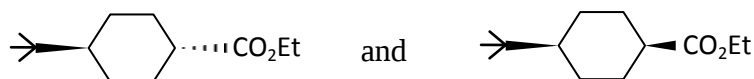
14. a) Cyclohexane cis-1,2-diol is cleaved by lead tetraacetate about 22 times faster than its 'trans'-isomer. — Explain.

b) Between cis and trans-1,3-dihydroxycyclohexane, which one is more stable and why?

[2+2+1]

c) Comment on the optical activity of cis- and trans-1,3-dimethylcyclohexane.

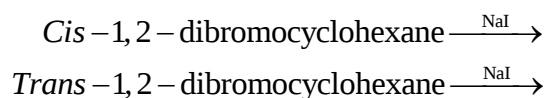
15. a) Which one of the following isomer is hydrolyzed in faster rate and why?



b) Draw the potential energy versus dihedral angle diagram for 1,2-ethanediol providing gauche, anti and eclipsed conformation.

[2+3]

16. a) Write down the product of the following reactions with proper mechanism.



b) Complete the following conversion with mechanism.

[2+3]

