

LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

B.Sc. DEGREE EXAMINATION – CHEMISTRY

SECOND SEMESTER – APRIL 2010

CH 2504/2502/2500 - HYDROCARBONS AND STEREOCHEMISTRY

Date & Time: 20/04/2010 / 1:00 - 4:00

Dept. No.

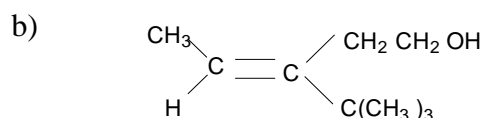
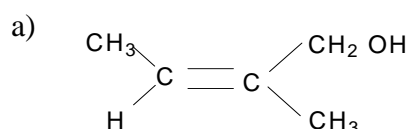
Max. : 100 Marks

**PART – A**

Answer ALL the questions

(10x2=20 marks)

1. Give the IUPAC names for the isomers of  $C_4H_{10}$ .
2. Write the structural formula for 2, 3-Dimethyl – 6- isopropylnonane.
3. Determine the configuration of each of the following alkenes as Z or E as appropriate.



4. Arrange the following free radicals in the increasing order of their stability.  
 $CH_3CH_2\bullet$ ,  $CH_3\bullet$ ,  $(CH_3)_3C\bullet$ ,  $(CH_3)_2CH\bullet$
5. How will you prepare n-propyl benzene by Friedel-Craft reaction?
6. Classify the following groups into ortho/para orienting and meta orienting.  
 $-NO_2$ ,  $-O-H$ ,  $-CH_3$ ,  $-COOH$
7. Write the structures of the following
  - (i) trans – 4 – tert – butyl methyl cyclohexane
  - (ii) trans –1, 2 – dimethyl hexane.
8. What are poly nuclear aromatic compounds? Give two examples.
9. How will you differentiate 1 – Butyne and 2 – Butyne.
10. What happens when toluene is nitrated?

**PART – B**

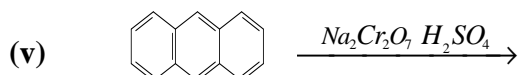
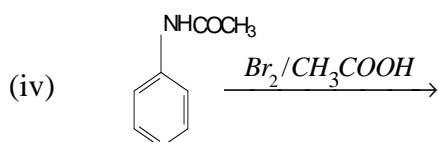
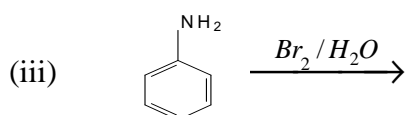
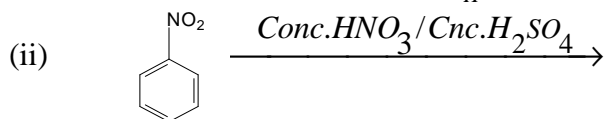
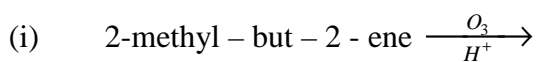
Answer any EIGHT questions

(8 x 5 = 40 marks)

11. Identify the alkene obtained on dehydration of (a) 3 – Ethyl – 3 – pentanol b) 2 –Propanol.
12. Give the structure of the product formed when each of the following alkene reacts with bromine in water.
  - a) 2 – methyl – 1 – butene
  - b) 1 – methylcyclopentene.
13. Explain Bayer's strain theory.
14. Using Dieckmann's Synthesis, prepare cyclopentanone.
15. Write the mechanism of addition of  $Br_2$  in  $CCl_4$  on ethylene.
16. Explain Saytzeff rule with a suitable example.
17. Oxidation of bicyclo [2,2,1] hept – 2 – ene with Sodium permanganate in water, followed by acidification with sulphuric acid, gave a single product having a molecular formula  $C_7H_{10}O_4$ . What is the structure of this product.
18. Explain the mechanism of hydroboration of 1-butene.

(P.T.O.)

19. Predict the product and mechanism of the HBr addition to propene.
20. Explain Ziegler–Natta catalyzed reaction.
21. Write the mechanism of Friedel-Craft's acylation.
22. Write the structure of the product for the following reaction.



### PART -C

Answer any FOUR questions

(4 x 10 = 40 marks)

23. a) What is mesomeric effect? Give an example and explain the operation of this effect.  
 b) Which is more acidic? Benzoic acid or p-nitro benzoic acid.
24. a) Explain Inductive effect with a suitable example.  
 b) Arrange the following in the order of increasing basic strength.  
 i) Aniline ii) p-methyl aniline iii) p-nitro aniline iv) Anilinium ion.
25. a) Predict the reaction sequence
- $$CH_2 = CH_2 \xrightarrow[CCl_4]{Br_2} A \xrightarrow[2.H_2O]{1.NaNH_2} B \xrightarrow{2HBr} C .$$
- b) Give the structure of the enol formed by hydration of 2-butyne and write a series of equation showing its conversion to its corresponding ketone isomer.
26. a) Explain the mechanism of sulphonation of benzene.  
 b) Explain -1,2- and 1,4 – addition of HBr with 1,3 – butadiene.
27. a) Explain Diel's Alder reaction taking a suitable example.  
 b) Write Haworth synthesis of Naphthalene.
28. Write various possible conformers of cyclohexane and explain their stabilities.

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