

SEM	SET	PAPER CODE	TITLE OF THE PAPER
VI	2012	11UCH630211	ORGANIC CHEMISTRY – II

**SECTION – A****Answer all the questions:****20 x 1 = 20****Choose the correct answer:**

- Which of the following pairs of amines cannot be distinguished by Hinsberg's test?
  - Aniline + ethyl amine
  - N, N – dimethylaniline + diethyl amine
  - Diethyl amine + tri ethylamine
  - Both a and b
- What is the product obtained when benzyl chloride is heated with anhydrous  $\text{AlCl}_3$ ?
  - Naphthalene
  - Anthracene
  - Nanthrene
  - Biphenyl
- The wavelength range of IR light is \_\_\_\_\_.
  - 190 – 400 nm
  - 400 – 800 nm
  - $667 – 4000 \text{ cm}^{-1}$
  - 70 eV
- Which of the following is magnetically active?
  - $^1\text{H}$
  - $^2\text{D}$
  - $^{18}\text{O}$
  - $^{15}\text{N}$
- What is the  $[\text{M}]^+$  value for neopentane?
  - 72
  - 73
  - 74
  - 91

**Fill in the blanks:**

6. Aniline reacts with nitrating mixture to give \_\_\_\_\_.
7. The resonance energy of naphthalene is \_\_\_\_\_.
8. The IR frequency of  $\equiv \text{C-H}$  is observed at \_\_\_\_\_.
9. The number of signals observed for  $\text{Cl} - \text{CH}_2 - \text{CH}_2 - \text{Cl}$  in  $^1\text{HNMR}$  is \_\_\_\_\_.
10. According to N rule in MS, an odd numbered molecular mass required \_\_\_\_\_ number of nitrogen atoms.

**State True or False:**

11. Benzene diazonium salts on hydrolysis yields phenols.
12. When brominated, diphenylmethane gives diphenylmethyl bromide.
13. The light source used in uv – vis spectrometre is W filament lamp.
14. The chemical shift values will always be positive.
15. The  $[\text{M} - 127]^+$  peak indicates the presence of Cl in the analyte.

**Match the following:**

- |   |   |
|---|---|
| 16. Acetamide $\rightarrow$ methyl amine          | - a) 2 $^1\text{HNMR}$ signal               |
| 17. 2 benzene $\xrightarrow[\Delta]{\text{Fe}}$ ? | - b) Hooke's law                            |
| 18. $\bar{\nu} \propto k$                         | - c) Hofmann rearrangement                  |
| 19. Mesitylene                                    | - d) biphenyl                               |
| 20. m/e 91  | - e) phenyl cation<br>- f) tropylium cation |

**SECTION – B**

**Answer all the questions:**

**5 x 4 = 20**

21. a. Write any two methods of preparation of nitrobenzene.

**OR**

- b. How is benzene diazonium chloride prepared? Write its reaction with alkaline  $\beta$ -naphthol solution.
22. a. Discuss Haworth synthesis of phenanthrene from naphthalene.

**OR**

- b. Discuss the mechanism of nitration of naphthalene and predict the dinitro derivatives.
23. a. Describe the types of electronic transitions in organic molecules under uv – vis light with a neat diagram.

**OR**

- b. Write a short note on finger print region in IR spectrum.
24. a. Draw the schematic representation of NMR spectrophotometer and explain components in it.

**OR**

- b. Write a note on: (a) TMS – an internal standard in NMR (b) Coupling constant.
25. a. Predict the structure of an aliphatic ketone whose peaks in the mass spectrum having m/e values 86, 71, 58, 43 (100%).

**OR**

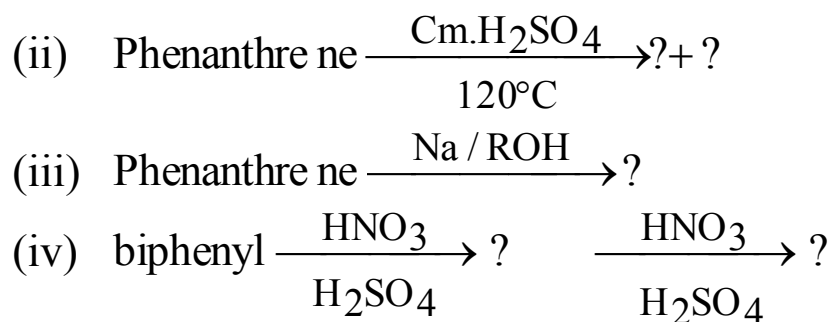
- b. Write a note on metastable ions and its uses in MS.

### **SECTION – C**

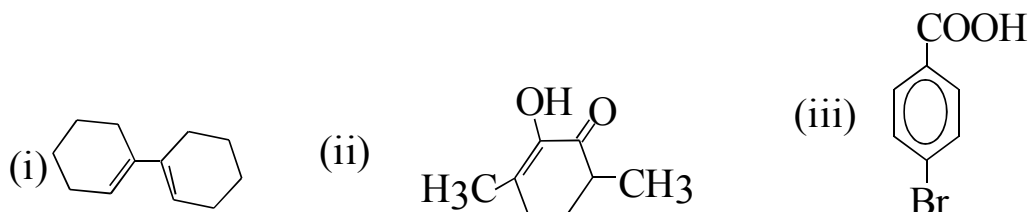
**Answer any FOUR questions:**

**4 x 15 = 60**

26. a. What are the reduced products of nitrobenzene in acidic, neutral and basic conditions?
- b. What is carbylamine test? Give an example.
27. a. Discuss the steps involved in the synthesis of naphthalene from benzene. (8)
- b. Predict the products in the following reactions. (7)
- (i) anthracene +  $\text{Cl}_2 \longrightarrow ? + ?$



28. a. Calculate  $\lambda_{\text{max}}$  values for the following compounds using Woodward – Fieser Rules. (9)



- b. Discuss the factors affecting frequency of absorption of carbonyl group in IR spectrum. (6)
29. a. Describe the various factors which affect the magnitude of the chemical shift. (8)
- b. Explain the number of signals and multiplicity of  
 (i) Ethyl acetate      (ii) 2-chlorobutane in  $^1\text{H}$  NMR. (7)
30. a. Explain the instrumentation of mass spectrometer. (10)
- b. Write a note on McLafferty rearrangement in MS and its application. (5)

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