



Progressive Education Society's  
Modern College of Arts, Science & Commerce Ganeshkhind, Pune – 16  
(Autonomous)  
End Semester Examination: MAR / APR 2025  
Faculty: Science and Technology

Program: (BScGen03)  
Program (Specific): General B.Sc.  
Class: T.Y. B.Sc.  
Name of the Course: Organic Chemistry-II  
Course Code:24-CH-607  
Paper:

Semester: VI

SET: A  
Course Type: DSEC  
Max. Marks: 35

Time: 2Hr

**Instructions to the candidate:**

- 1) There are 4 sections in the question paper. Write each section on separate page.
- 2) All Sections are compulsory.
- 3) Figures to the right indicate full marks.
- 4) Draw a well labelled diagram wherever necessary.

**Q1) Define or Explain the following. (Any 5)**

5

- a) Define chromophore.
- b) Define chemical shift.
- c) Explain the term Auxochrome with suitable example.
- d) Explain  $\pi$ - $\pi^*$  transitions with suitable example.
- e) Define coupling constant?
- f) Explain the coupling constant.

**Q2) Very short answer questions (Attempt any 4/6)**

4

- a) What is spectroscopy?
- b) Calculate the fundamental modes of vibrations in  $\text{CO}_2$ .
- c) Express  $2\mu$  in  $\text{cm}^{-1}$ .
- d) Calculate the fundamental modes of vibrations in  $\text{NH}_3$
- e) How many sets of protons are present in  $-\text{CH}_3 - \text{CH}_2 - \text{O} - \text{CH}_3$
- f) Draw chair conformation of cyclohexane.

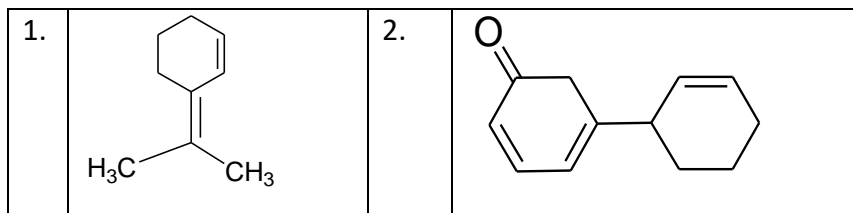


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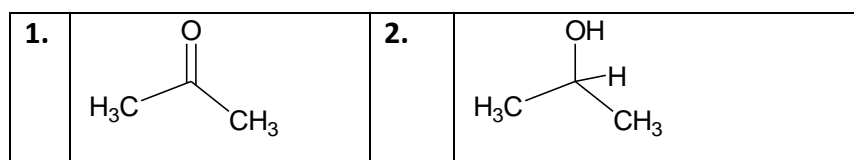
**Q3) Short answer questions (Attempt any 4/6)**

**8**

**a) Calculate the  $\lambda_{\max}$  values of the following compounds**



**b) How will you distinguish the following pairs by I.R. spectroscopy?**



**c) How IR spectroscopy is useful for the determination of hydrogen bonding in a molecule?**

**d) Which are the sub regions from the view point of interpretation of IR-Spectrum?**

**e) Write short note on types of vibrations.**

**f) Give applications of UV spectroscopy.**

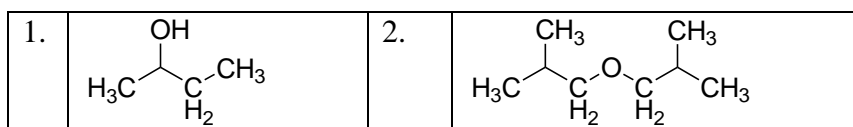
**Q4) Short answer questions (Attempt any 4/6)**

**8**

**a) Write note on shielding and deshielding.**

**b) Aniline shows blue shift in acidic medium. Explain.**

**c) How many types of protons are present in the following compounds?**



**d) How many sets of protons are present in ethanol.**

**e) What is hypsochromic shift?**

**f) How IR spectroscopy is useful for the determination of hydrogen bonding in a molecule?**



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**Q5) Attempt any two of the following (2/4)**

**10**

- a) What is bathochromic shift? P-nitrophenol Shows red shift in alkaline medium explain.
- b) TMS is used as internal standard in NMR spectroscopy. Why?
- c) Propose structures for the compounds from the following spectroscopic data. Justify your answer of following compound.



IR.: 1715 cm<sup>-1</sup>

PMR: (a) Triplet at 1.07 δ(3H)

(b) Singlet at 2.12 δ(3H)

(c) Quartet at 2.48 δ(2H)

- d) Explain factors affecting on IR frequencies.