

END SEMESTER EXAMINATION

MAY-2012

AC-104 APPLIED CHEMISTRY

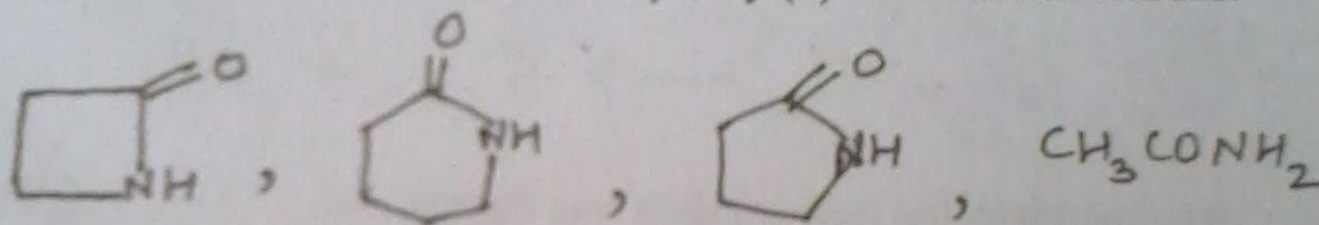
Time: 3:00 Hours

Max. Marks : 70

Note : Question No. ONE is compulsory.
Answer any **FIVE** questions from the rest.
Assume suitable missing data, if any.

1 Answer the following questions:

- [a] Distinguish between Iodimetry and Iodometry in volumetric analysis by taking suitable examples.
- [b] Arrange in increasing order of frequency (ν). Discuss the reasons.



- [c] Explain the criterion for a molecule to be IR active. Which of these is IR active \rightarrow CO_2 and trans-stilbene.
- [d] What constitutes the backbone of nucleic acid? Show the linkage present in nucleic acid.
- [e] How will you prepare Nylon-6 from cyclohexanone?
- [f] What do you mean by vulcanized rubber? Give the configuration of natural rubber.
- [g] What is invert sugar? Why it is so called? Name the enzyme which facilitates this reaction.
- [h] Write the names and structures of the monomers for (i) Neoprene (ii) Nomex. Also mention their important applications.
- [i] Is it possible to have a quadruple point on a phase-diagram for a one component system? Explain the answer.
- [j] Write four examples of secondary batteries.

2[a] Name the functional groups present in the following indicators and explain their solubility in water.

(i) Phenolphthalein

(ii) Eriochrome Black T

(iii) Starch

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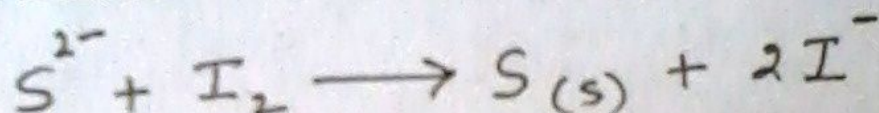
[b] \overline{M}_w is higher than \overline{M}_n . Explain by taking suitable example based on numerical value.

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3[a] What are proteins? How are they classified. Discuss briefly their 1°, 2° & 3° structures.

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[b] A 30.00 L air sample was passed through an absorption tower contained a solution of Cd^{+2} , where H_2S was retained as CdS . The mixture was acidified and treated with 10.00 ml of 0.01070 M I_2 . After the reaction

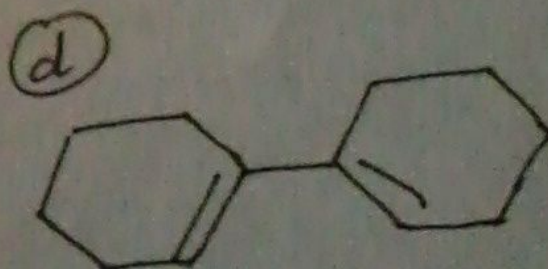
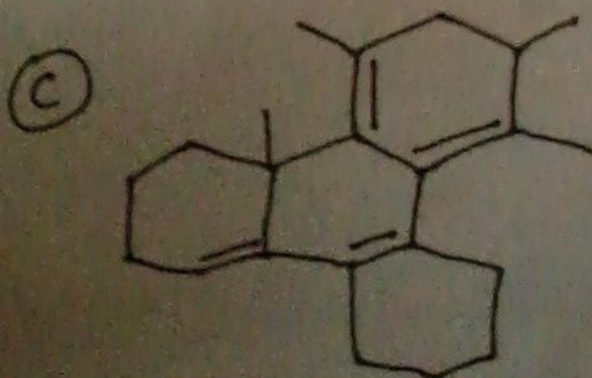
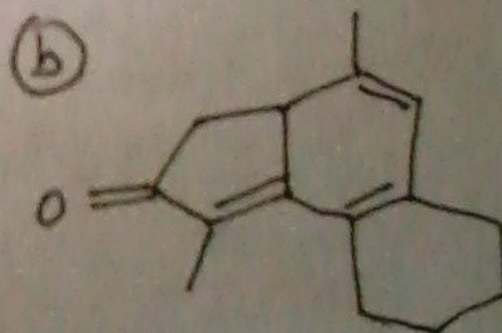
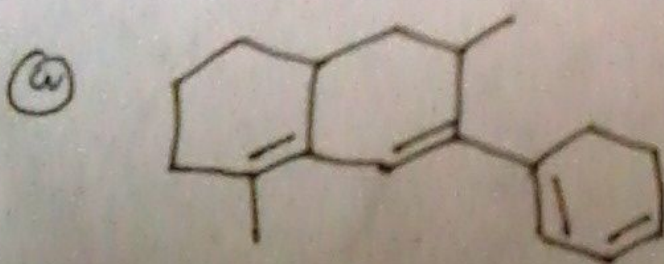


was complete, the excess iodine was titrated with 12.85 mL of 0.01344 M thiosulphate. Calculate the concentration of H_2S in ppm; use 1.20 g/L for the density of the gas stream.

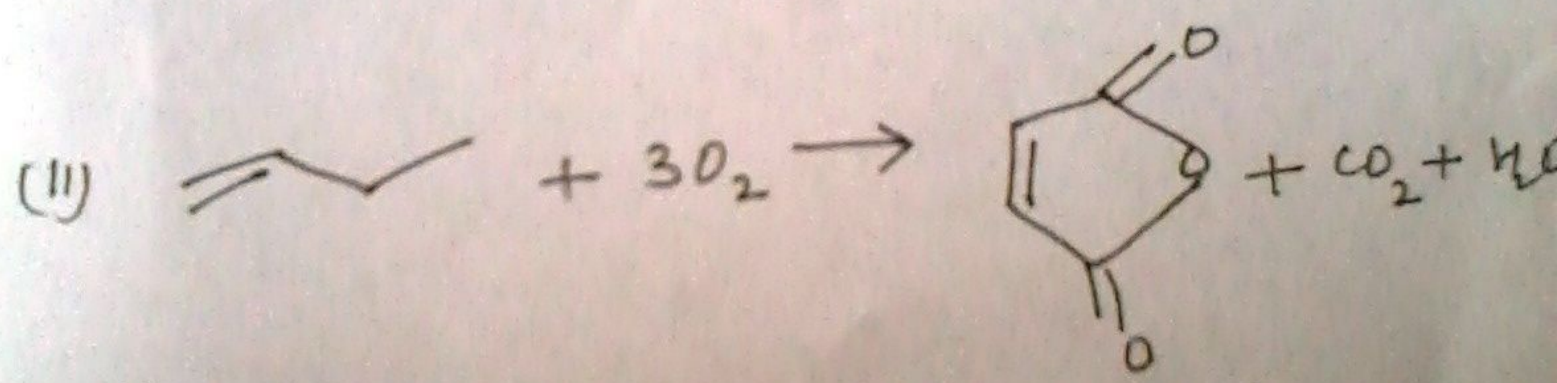
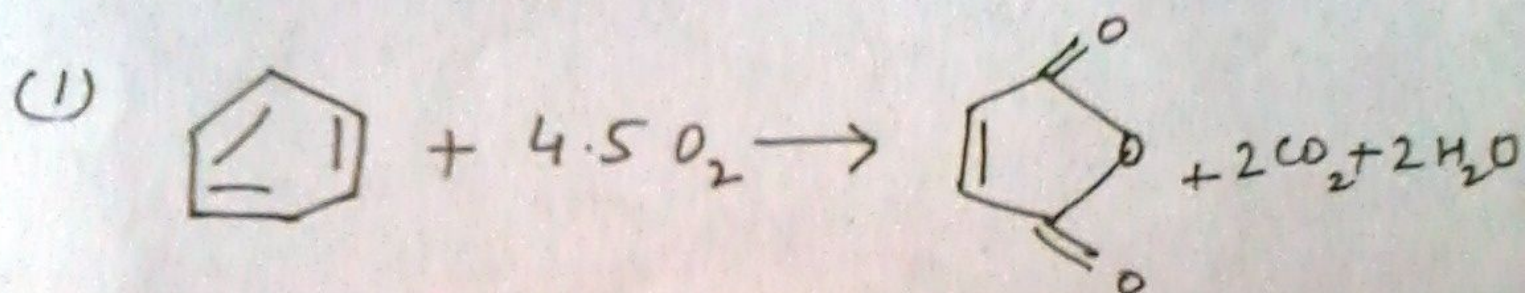
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4 Calculate the λ_{max} values for the following compounds

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- 5 (a) For each system, determine the number of components
- (i) $\text{NH}_4\text{Cl} - \text{NH}_3 - \text{H}_2\text{O}$ (dissociation of water may be included) 4
 - (ii) $\text{NaCl} - \text{KCl} - \text{H}_2\text{O}$ (exclude dissociation of water) 6
- [b] Write any six principles of green chemistry. Explain any one in detail. 6
- 6[a] Compare TGA and DTG with the help of a suitable thermogram and highlight the applications of DTG. 5
- [b] Which of these reactions is more atom economical. 5



- 7[a] What do you mean by eutectic mixture. Explain with general phase diagram. What do you mean by desilverisation of lead? 5
- [b] Write the advantages and disadvantages of Lithium ion battery. 3
- [c] Name any four green solvents. 2

8 Write short notes on any THREE:

- [a] Solar cell
- [b] DSC
- [c] Electro deposition
- [d] Complexometric titration.