

# Anjuman Islam Janjira Degree College of Science

Murud-Janjira, Raigad-402401  
Affiliated to University of Mumbai

<b>Class: -F.Y.B.Sc.(G.S)</b>	<b>Subject: - Chemistry- II</b>
<b>Semester:- II</b>	<b>Course code: -USCH202</b>
<b>Exam Event:- (FH) Summer 2024</b>	<b>Marks: - 75</b>
<b>Date: - 19/04/2024</b>	<b>Duration: - 2:30 Hours</b>

N.B:

1. All questions are compulsory.
2. Figures to the right indicate full marks.
3. Use of log-table/non programmable calculator is allowed.
4. Answer for the same question as far as possible should be written together.

## Q.1 Attempt any Four of the following

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- A. Explain the use of Henderson equation for the measurement pH of basic buffer solution.
- B. Define the term degree of ionization. What are the factors which affect the degree of ionization?
- C. Derive the expression for ionic product of water.
- D. What are the primary and secondary processes?
- E. Define wavelength and frequency. Give three characteristics of Electromagnetic radiation.
- F. A solution of tyrosine has an absorbance of 0.45 at 280nm having path length 1cm. If the molar absorptivity is  $1.28 \times 10^3 \text{ dm}^3/\text{cm}$ . Find out the concentration and the transmittance of the solution.

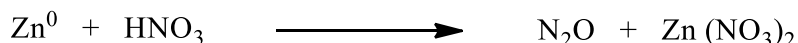
## Q.2 Attempt any Four of the following

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- A. Differentiate between ionic and covalent bond
- B. Draw the Lewis dot structure of following compound a)  $\text{H}_2\text{O}$  b)  $\text{NH}_3$  c)  $\text{CH}_4$
- C. Define Polarizability of anion. Explain any two factor which favor covalent character of ionic bond.
- D. Explain the Shape and the bond angle of the following molecules on the basis of VSEPR theory.

a)  $\text{SF}_6$       b)  $\text{SO}_2$       c)  $\text{BF}_3$

- E. Balance the redox equation by oxidative number method.



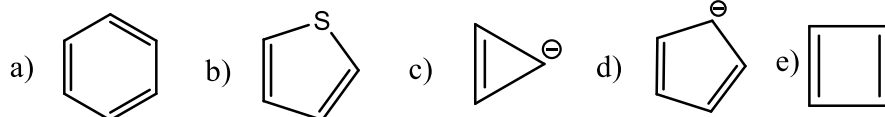
- F. Determine Oxidation Number of

a) S in  $\text{H}_2\text{SO}_4$       b) P in  $\text{PO}_4^{3-}$       c) Cr in  $\text{Cr}_2\text{O}_7^{2-}$

## Q.3 Attempt any Four of the following

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- A. What is Conformational Analysis? Explain Conformational Analysis of Cyclohexane
- B. Explain the types of strain?
- C. Explain aromatic electrophilic substitution with energy profile diagram.
- D. What is nitrating agent? Explain nitration of benzene
- E. Describe the concept of reactivity and orientation of ortho-para directing and activating group.
- F. Identify whether the following are aromatic or anti-aromatic



## Q.4 (A) Select the correct option & complete the sentences (Any Eight)

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- i. Which of the following phenomena describes the process by which electromagnetic radiation is absorbed and re-emitted by matter?
  - a) Planck's equation
  - b) Scattering
  - c) Beer-Lambert's law
- ii. Electromagnetic radiation contains discrete packets of energy called as \_\_\_\_\_.
  - a) Photons
  - b) Potential
  - c) Energy bytes

