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**B—19—2019**

**FACULTY OF SCIENCE**

**B.Sc. (Third Year) (Sixth Semester) EXAMINATION**

**MARCH/APRIL, 2019**

**(CGPA Pattern)**

**CHEMISTRY**

**Paper-XIV**

**(Organic and Inorganic Chemistry)**

**(Saturday, 16-3-2019)**

**Time : 10.00 a.m. to 12.00 noon**

*Time—2 Hours*

*Maximum Marks—40*

*N.B. :— (i) Attempt All questions.*

*(ii) Figures to the right indicate full marks.*

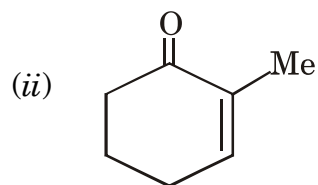
**Section A**

**(Organic Chemistry)**

1. Answer any *five* of the following : 5×2=10
- (a) What are amino acids ? How are they classified ? Give at least *one* example of each.
- (b) Give the following colour test of proteins :
- (i) Millon's test
- (ii) Xanthoproteic test.
- (c) What is zwitter ion ? Explain the dipolar nature of amino acids.
- (d) Explain the terms :
- Spin-spin coupling with coupling constant.
- (e) Predict the number of 'PMR' signals of :
- (i) Acetone
- (ii) Ethyl benzene.

P.T.O.

- (f) Define the terms :
- (i) Fundamental band
  - (ii) Overtone.
- (g) Calculate the  $\lambda_{\max}$  of :
- (i) 2, 5 dimethyl 2, 4, 6-octatriene.



2. Answer any *two* of the following : 2×5=10
- (a) Explain Hofmann rearrangement reaction with mechanism.
  - (b) How will you interpret I.R. spectra of the following compounds :
    - (i) Phenol
    - (ii) Acetophenone
    - (iii) 2-propanol.
  - (c) How will you prepare glycine by Strecker's synthesis and what happens when :
    - (i) Reaction of ethyl alcohol on glycine
    - (ii) Action of heat on glycine.

3. Answer any *one* of the following : 1×7=7
- (a) An organic compound with molecular formula "C<sub>3</sub>H<sub>8</sub>O" given the following spectral data :
    - UV : Transparent  $\lambda_{\max}$  210 nm
    - IR : 2960, 2880, 1395 and 1095 cm<sup>-1</sup>
    - PMR :  $\delta_{1.2}(t, 3H)$   
 $\delta_{3.5}(q, 2H)$   
 $\delta_{2.6}(s, 3H)$

Deduce the structure and name of organic compound.

- (b) What are Polymers ? Give its *two* examples. Explain in detail condensation polymerization reaction. Give synthesis and importance of :
- (i) Neoprene
  - (ii) Polymethyl methacrylate.

### Section B

#### (Inorganic Chemistry)

4. Solve any *three* of the following : 3×3=9
- (a) Give the postulates of valence bond theory of coordination compound.
  - (b) Describe the splitting of *d*-orbitals in octahedral complexes.
  - (c) Calculate the CFSE in tetrahedral complexes having  $d^1$ ,  $d^2$ ,  $d^3$  electronic configuration.
  - (d) Explain spin selection rule of electronic transition.
  - (e) Describe single Orgel diagram for  $d^1$  and  $d^9$  configuration.
5. Solve any *two* of the following : 2×2=4
- (a) State Jahn-Teller theorem.
  - (b) What are the limitations of CFT.
  - (c) Draw the shape of *d*-orbitals and explain it.
  - (d) Explain *d-d* transition with suitable example.