B—29—2019

FACULTY OF SCIENCE

B.Sc. (Third Year) (Fifth Semester) EXAMINATION

MARCH/APRIL, 2019

(CGPA)

CHEMISTRY

Paper-XII [CH-301]

(Organic and Inorganic Chemistry)

(Monday, 18-3-2019)   **Time : 10.00 a.m. to 12.00 noon**

Time—2 *Hours*   *Maximum Marks*—40

N.B. :— (i)   Attempt *All* questions.

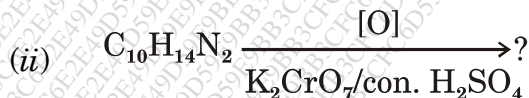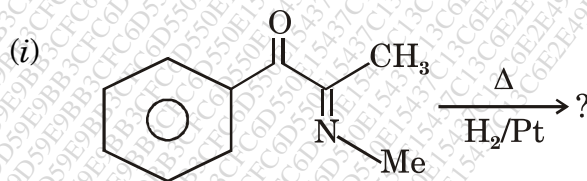   (ii)   Figures to the right indicate full marks.

Section A

(Organic Chemistry)

1.   Answer any *five* of the following :   5×2=10

     (*a*)   Predict the product(s) :

        (*i*)

        (*ii*) $C_{10}H_{14}N_2 \xrightarrow[\text{K}_2\text{CrO}_7/\text{con. H}_2\text{SO}_4]{[O]} ?$

     (*b*)   Write the structural formula of vitamin 'A'. Mention its sources, diseases caused by its deficiency and what does it do ?

     (*c*)   Explain the terms antidiabetics and antifungal. Give at least *one* example of each.

                                    P.T.O.

(d) Explain Witt's theory with examples.

(e) How will you prepare pyridine from hydrogen cyanide ?

(f) What happens when pyrrole combine with chloroform and potassium hydroxide ?

(g) How will you obtain thiophene from *n*-butane ?

2. Answer any *two* of the following : 2×5=10

(a) What are chemotherapeutic agents ? Give the synthesis and uses of the following drugs :

    (i) Paracetamol

    (ii) Benzocaine.

(b) What are heterocyclic compounds ? How will you convert :

    (i) Pyrrole to pyrrolidine

    (ii) Furan to 2-lithium furan

    (iii) Pyridine to pyridine-3-sulphuric acid

    (iv) Thiophene to 2-chloromethylthiophene.

(c) What are Pesticides ? Give the synthesis and uses of the following pesticides :

    (i) DDT

    (ii) BHC.

3. Answer any *one* of the following : 1×7=7

(a) What are dyestuff ? Give the synthesis and applications of the following dyes :

    (i) Malachite green

    (ii) Methyl orange.

(b) Give the synthesis of nicotine and ephedrine.

Section B

(Inorganic Chemistry)

4. Solve any *three* of the following : 3×3=9

   (a) Define ligand. How are they classified ?

   (b) Differentiate between metal complex and metal chelate.

   (c) What are geometrical isomerism ? Explain it in coordination number four complexes.

   (d) Classify the following acids and bases as hard and soft :

   $$Na^+, I^+, Cu^+, I^{+5}, CN^-, NH_3.$$

   (e) What is symbiosis ? Explain it with suitable examples.

5. Solve any *two* of the following : 2×2=4

   (a) What are linkage isomerism ? Give their suitable examples.

   (b) Calculate EAN of :

   (i) $[Co(NH_3)_6]^{+3}$

   (ii) $K_4[Fe(CN)_6]$.

   (c) Write the IUPAC formula of the following coordination compounds :

   (i) Dichlorobis(ethylenediamine) cobalt (III) sulphate

   (ii) Tetracarbonyl nickel (o)

   (d) State and explain Pearson principle.