

Reg. No. :

D 2150

Q.P. Code : [D 07 PCH 04]

(For the candidates admitted from 2007 onwards)

M.Sc. DEGREE EXAMINATION, MAY 2014.

Second Year

Chemistry

ORGANIC CHEMISTRY — II
(ORGANIC SYNTHESIS AND NATURAL
PRODUCTS)

Time : Three hours

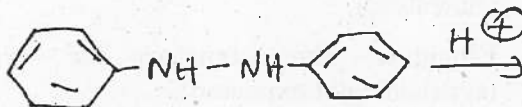
Maximum : 100 marks

Answer any FIVE questions.

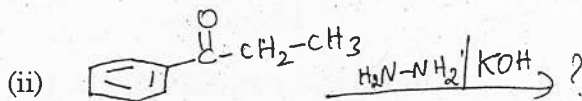
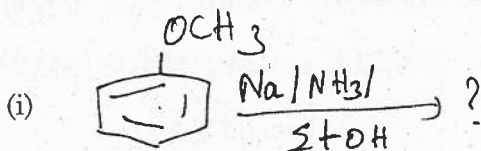
All questions carry equal marks.

(5 × 20 = 100)

1. (a) Explain the mechanism of Wagner-Meerwein rearrangement with suitable examples. (10)
- (b) Complete and propose suitable mechanism for the following rearrangement : (10)

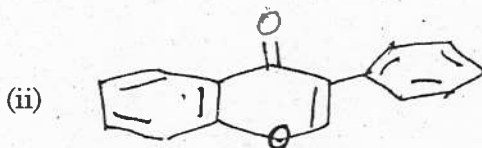
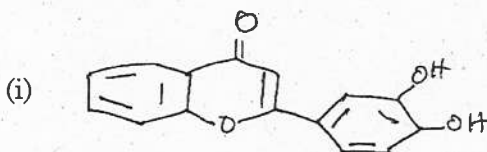


2. (a) Give an example for Norrish-type-II reaction and discuss its mechanism. (10)
- (b) Write the products(s) of the following reactions and propose suitable mechanism : (10)



3. (a) Illustrate Barbier-Wieland mechanisms degradation with suitable examples. (10)
- (b) Write the method of preparation and synthetic utility of the following reagents : (10)
- (i) DDQ
- (ii) DBU.
4. (a) Elucidate the structure of caryophyllene. (10)
- (b) Explain the synthesis of eudesmol. (10)
5. (a) Describe the synthesis of estrone from cholesterol. (10)
- (b) Elucidate the structure of ergosterol (synthesis not expected). (10)

6. (a) What is the source of morphine? Elucidate its structure (synthesis not expected). (10)
- (b) Write the total synthesis of quinine. (10)
7. (a) How do you classify proteins? Discuss the primary and secondary structures of polypeptides. (10)
- (b) Write the synthesis of the following components. (10)



8. (a) Explain McLafferty rearrangement with suitable examples. (10)
- (b) Write short notes on the following :
- (i) Octants rule
- (ii) Molecular ion peak
- (iii) Axial halo ketone rule. (4 + 2 + 4 = 10)

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Q.P. Code : [D 07 PCH 05]

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M.Sc. DEGREE EXAMINATION, MAY 2014.

Second Year

Chemistry

INORGANIC CHEMISTRY — II

Time : Three hours

Maximum : 100 marks

Answer any FIVE questions.

Each question carries 20 marks.

(5 × 20 = 100)

1. (a) Discuss the splitting of d-orbitals by CFT in octahedral and tetrahedral environment (10)
- (b) Draw molecular orbital energy level diagrams of $[\text{Co}(\text{NH}_3)_6]^{3+}$ and $[\text{CoF}_6]^{3-}$ and explain. (10)
2. (a) Explain Tanabe-Sugano diagram for Co^{3+} system. (10)
- (b) Describe Jahn-Teller distortions with an example. (10)

3. (a) Discuss the structure and bonding in the following compounds :
- (i) $\text{Fe}_2(\text{CO})_9$ (3)
 - (ii) $\text{Fe}_3(\text{CO})_{12}$ (3)
 - (iii) Zeise's salt. (4)
- (b) Explain the structure and functions of cyanocobalamin. (10)
4. (a) Explain the mechanism of base hydrolysis of Co (III) complexes. (10)
- (b) What are hydroformylation reactions? Give an example. Discuss its mechanism. (10)
5. Write notes on complexes of
- (a) β - diketones (7)
 - (b) Polyenes (7)
 - (c) Allyl. (6)
6. (a) Give an account of the preparation, properties and structure of ferrocene. (10)
- (b) Illustrate the role of chlorophyll in photosynthesis. (10)
7. Explain :
- (a) Isolobal analogy (10)
 - (b) Structural implications of the isolobal analogy. (10)

8. (a) What are the applications of HPLC in chemical analyses? (5)
- (b) Explain electron diffraction technique with suitable diagram. (10)
- (c) Compare and contrast the X-ray and neutron diffraction. (5)
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Second Year

Chemistry

PHYSICAL CHEMISTRY — II

Time : Three hours

Maximum : 100 marks

Answer any FIVE questions.

All questions carry equal marks.

1. (a) Give the salient features of ARRT. (10)
(b) Discuss the kinetic isotope effect. (10)
2. (a) Give the principle and explain the shock-tube method. (10)
(b) Write notes on the influence of ionic strength on rates of reactions in solutions. (10)
3. (a) Derive the Michaelis-Menten law. (10)
(b) (i) Distinguish between physisorption and Chemisorption. (5)
(ii) Discuss the influence of pH on enzyme catalysis. (5)

4. (a) How will you determine the equivalent conductance of a strong electrolyte? (10)
- (b) Give a detailed account of stern theory. (10)
5. (a) (i) List the advantages and disadvantages of dropping mercury electrode. (5)
- (ii) How is $E_{1/2}$ determined? (5)
- (b) Give the principle and applications of coulometric method. (10)
6. (a) Give the principle involved in DSC and DTA analyses. (10)
- (b) Give a detailed account of cotton effect. (10)
7. (a) Discuss the instrumentation and list the applications of HPLC. (10)
- (b) Write short notes on :
- (i) Koopman's theorem. (5)
- (ii) Auger electron. (5)
8. (a) Discuss the structure of diamond and graphite. (10)
- (b) (i) What is called the structure factor? (5)
- (ii) Write short notes on :
Spectral width. (5)