

**M. Sc (Chemistry) – 3<sup>rd</sup> SEMESTER**  
**SPECIAL EXAMINATION, AUGUST-2018**  
**Organic Special – I, 9040313**

TIME: 03: 00 Hrs.

Max. Marks: 80

**INSTRUCTIONS:**

1. Write Roll No. on the Question Paper.
2. Candidate should ensure that they have been provided with the correct question paper. Complaints in this regard, if any, should be made within 15 minutes of the commencement of the exam. No complaint(s) will be entertained thereafter;
3. Question No. 1 is Compulsory. Attempt **Five** Questions in all.
4. Students are required to attempt other **FOUR** Question from each **SECTION**. All questions carry equal marks.
5. Draw diagram whenever required.

- Q.1** Explain the following **(2 X 8 = 16)**
- a) Chromophores?
  - b) Bathochromic shift?
  - c) Fundamental vibrations?
  - d) Fermi resonance?
  - e) Phenomenon of resonance in NMR?
  - f) Phenomenon of relaxation in NMR?
  - g) Haloketo rule?
  - h) Fragment ions?

**SECTION - A**

- Q.2** Explain Wood-ward and Fieser's rules for calculating ultraviolet absorption maxima for substituted dienes and conjugated dienes with suitable examples? **(16)**
- Q.3** (a) Explain the ultraviolet spectrometer with diagram? **(08)**  
 (b) Briefly discuss application of UV spectroscopy to problems in organic chemistry? **(08)**

**SECTION - B**

- Q.4** Explain the IR spectral features of the following functional groups with suitable examples:  
 Aromatic compounds, Aldehydes, Ketones and Amines? **(16)**
- Q.5** (a) Discuss Functional group and finger print regions? **(08)**  
 (b) Explain the FT IR spectrometer with diagram? **(08)**

**SECTION - C**

- Q.6** What is chemical Shift? Explain the factors influencing on chemical shift? **(16)**
- Q.7** Explain the following **(8 X 2 = 16)**
- a) Double resonance?
  - b) Off resonance decoupling?

**SECTION - D**

- Q.8** Explain the principle and instrumentation of Mass Spectrometry? **(16)**
- Q.9** Briefly discuss the following. **(8 X 2 = 16)**
- a) Ortho effect
  - b) Cotton effect and Cotton curves

**M. Sc (Chemistry) – 3<sup>rd</sup> SEMESTER**  
**SPECIAL EXAMINATION, AUGUST-2018**  
**Organic Chemistry Special – II, 9040314**

TIME: 03: 00 Hrs.

Max. Marks: 80

**INSTRUCTIONS:**

1. Write Roll No. on the Question Paper.
2. Candidate should ensure that they have been provided with the correct question paper. Complaints in this regard, if any, should be made within 15 minutes of the commencement of the exam. No complaint(s) will be entertained thereafter;
3. Question No. 1 is Compulsory. Attempt **Five** Questions in all.
4. Students are required to attempt other **FOUR** Question from each **SECTION**. All questions carry equal marks.
5. Draw diagram whenever required.

- Q.1** Answer all the following: **(2 X 8 = 16)**
- a) Give the biological importance of vitamin D.
  - b) What is the role of coenzyme-II?
  - c) Why vitamins are essential?
  - d) Give the structure of FAD.
  - e) Differentiate between enzymes and coenzymes?
  - f) Explain the structure of haemin.
  - g) Give the structure of pantothenic acid.
  - h) Write a short note on Flavonol.

**SECTION - A**

- Q.2** (a) Describe the synthesis of vitamin-A. **(10)**  
 (b) Explain the structure elucidation & synthesis of vitamin B<sub>2</sub> **(06)**
- Q.3** (a) Describe the structural elucidation and synthesis of vitamin C **(10)**  
 (b) Explain the synthesis of nicotinic acid. **(06)**

**SECTION - B**

- Q.4** (a) Describe the spectral elucidation & synthesis of β-carotene. **(10)**  
 (b) Explain the synthesis of lycopene. **(06)**
- Q.5** (a) Explain the spectral properties of synthesis of porphyrins. **(10)**  
 (b) Discuss the synthesis of α-carotene. **(06)**

**SECTION - C**

- Q.6** (a) Describe the structure and synthesis of flavone and Xanthone **(10)**  
 (b) Write short notes on the following:  
 i) Malvidin chloride **(3)**  
 ii) Hirsudin chloride **(3)**
- Q.7** (a) Describe structure elucidation and synthesis of Quercetin and Diadazin. **(10)**  
 (b) Give brief account on xanthone. **(06)**

**SECTION - D**

- Q.8** Write short notes on the following: **(4 X 4 = 16)**
- |                         |                  |            |
|-------------------------|------------------|------------|
| a) Biological catalysis | c) Coenzyme-I    | <b>[4]</b> |
| b) Pyridoxal phosphate  | d) Epimerisation | <b>[4]</b> |
- Q.9** (a) How the acylation and decarboxylation reactions are catalysed by enzymes? **(06)**  
 (b) Explain the nomenclature of enzymes. **(04)**  
 (c) Write short notes on the following:  
 i) Co-carboxylase **(3)**  
 ii) Coenzyme-A **(3)**

**M. Sc (Chemistry) – 3<sup>rd</sup> SEMESTER**  
**SPECIAL EXAMINATION, AUGUST-2018**  
**Organic Special – III, 9040315**

TIME: 03: 00 Hrs.

Max. Marks: 80

**INSTRUCTIONS:**

1. Write Roll No. on the Question Paper.
2. Candidate should ensure that they have been provided with the correct question paper. Complaints in this regard, if any, should be made within 15 minutes of the commencement of the exam. No complaint(s) will be entertained thereafter;
3. Question No. 1 is Compulsory. Attempt **Five** Questions in all.
4. Students are required to attempt at least **ONE Question** from each **SECTION**. All questions carry equal marks.
5. Draw diagram whenever required.

**Q.1** Answer all the following:**(8 X 2 =16)**

- a) Discuss aromaticity by considering an example of heterocyclic ring.
- b) Draw the resonance structure of phosphorus ylide.
- c) Why the nucleophilic substitution is easier in pyrimidine?
- d) What are amphoteric compounds?
- e) Comment on stability and reactivity of phosphorus ylide by giving a suitable example.
- f) Give resonance structure of azomethine ylide.
- g) What is the working mechanism of Aspirin.
- h) Explain Fischer oxazole synthesis of oxazole.

**SECTION - A****Q.2 (a)** Discuss the method of synthesis and chemical reactions of oxazole. **(10)****(b)** Describe Hantzsch thiazole synthesis. **(06)****Q.3 (a)** Describe the synthesis and chemical reactions of imidazoles. **(10)****(b)** Explain the mechanism of keto–enol tautomerism. **(06)****SECTION - B****Q.4 (a)** Discuss in detail structural elucidation of Caffeine? **(10)****(b)** Write down the synthesis and chemical reaction of purines. **(06)****Q.5 (a)** Elucidate the structure of nucleotide. **(10)****(b)** Discuss in detail the structural elucidation of nucleoside. **(06)****SECTION - C****Q.6 (a)** What are nitrogen ylides? Discuss its role in the synthesis of organic compounds? **(10)****(b)** Given some examples of chemical reactions of phosphorus ylides. **(06)****Q.7** Discuss the following:

- a) Oxirane formation from sulfur ylide **(7)**
- b) Sommet rearrangement **[6]**
- c) Resonance structure of Nitrile ylide **[3]**

**SECTION - D****Q8** Write detailed notes on the following:**a)** Antimalarial drugs **[10]****b)** antipyretic drugs **[6]****Q9** Write detailed notes on the following:**(8 X 2 = 16)****(a)** Sulpha drugs**(b)** Anticancer drugs

Roll No. \_\_\_\_\_

**M. Sc (Chemistry) – 4<sup>th</sup> SEMESTER**  
**SPECIAL EXAMINATION, AUGUST-2018**  
**Organic Special – VI, 9040415**

**TIME: 03: 00 Hrs.**

**Max. Marks: 80**

**INSTRUCTIONS:**

1. Write Roll No. on the Question Paper.
2. Candidate should ensure that they have been provided with the correct question paper. Complaints in this regard, if any, should be made within 15 minutes of the commencement of the exam. No complaint(s) will be entertained thereafter;
3. Question No. 1 is Compulsory. Attempt Five Questions in all.
4. Students are required to attempt other **FOUR Question** from each **SECTION**. All questions carry equal marks.
5. Draw diagram whenever required.

**Q.1 Give one significant application of each of the following: (2 X 8 = 16)**

- a) n-Butyllithium
- b) Boron Trifluoride
- c) DCC
- d) Sodamide
- e) Perbenzoic acid
- f) Pinacol-pinacolone rearrangement
- g) Curtius reaction
- h) Phase Transfer Catalysts

**SECTION – A**

**Q.2 Discuss the preparation and applications of Grignard reagents (08)**

**Q.3 (a) Illustrate significant uses of Trimethyl Silyl Iodide (08)**  
**(b) Explain the importance of organo palladium(II) compounds in organic synthesis (08)**

**SECTION - B**

**Q.4 Discuss the preparation and applications of the following (8 X 2 = 16)**

- a) Boron Trifluoride
- b) N-Bromo Succinamide

**Q.5 (a) What are 1,3 Dithanes? Explain its importance in organic synthesis. (08)**  
**(b) Discuss the preparation and applications of Polyphosphoric acid. (08)**

**SECTION – C**

- Q.6** Discuss the preparation and applications following oxidizing agents in detail. **(8 X 2 = 16)**  
a) Chromium oxide  
b) Leadtetraacetate

- Q.7** Explain the importance of catalytic hydrogenations in organic synthesis? **(16)**

**SECTION –D**

- Q.8** Discuss the mechanism and applications of the following name reactions in detail **(8 X 2 = 16)**  
a) Shapiro Reaction  
b) Baeyer Villiger Oxidation

- Q.9** Explain the mechanism and synthetic applications of: **(8 X 2 = 16)**  
a) Benzil-benzilic acid rearrangement  
b) Wagner Meerwein rearrangement