Reg. No. | | | | | | | | | |

BSCCHC 382/BSCCHC 358

Choice Based Credit System/Credit Based VI Semester B.Sc. Degree Examination, September 2022
(2020 – 21 and Earlier Batches)/(2021 – 22 Batch Onwards)
CHEMISTRY (Paper – VIII)

Time : 3 Hours Max. Marks : 80

Instructions : *1) A single booklet containing **40** pages will be **issued**. **No** additional sheets will be issued. Write questions number and subdivisions **clearly**.*

*2) Write equations and diagrams **wherever** necessary.*

*3) Answer Part – **A** in the **first two** pages of answer book.*

*4) Scientific calculators are **allowed**.*

PART – A

I. 1) Answer **any ten** of the following. **(2×10=20)**

a) State Beer-Lambert's law.

b) What type of compounds absorbs UV radiations ? Give an example.

c) State Frank-Condon principle.

d) What is meant by chemical shift in NMR spectra ?

e) State Koopman's theorem.

f) Mention any two advantages of NMR spectroscopy.

g) Write any two applications of mass spectroscopy.

h) Define octane number.

i) Mention the composition of crude oil.

j) What is isoprene rule ?

k) How sulphanilamide is prepared ?

l) What are insecticides ? Give an example.

PART – B

II. Answer **any four** questions, selecting **any one** question from **each** Unit. **Each** question carries **15** marks. **(15×4=60)**

Unit – I

2) a) Explain different electronic transitions that take place when a molecule absorbs UV or visible radiation. **4**

b) Write any four differences between colorimeter and spectrophotometer. **4**

c) i) Derive an expression for Beer-Lambert's law. **4**

ii) What are chromophores and auxochromes ? **3**

3) a) Write a note on the following terms giving example for each.

i) Blue shift ii) Hyperchromic shift. **3**

b) Describe the instrumentation of UV spectrophotometer with a neat schematic diagram. **5**

c) i) What are the important properties of colored system suitable for measurements ? **4**

ii) Explain the validity of Beer-Lambert's law. **3**

Unit – II

4) a) Explain the theory of NMR spectroscopy taking proton as an example. **4**

b) Discuss spin-spin coupling with suitable example. **4**

c) i) Write a note on nuclear shielding and deshielding. **4**

ii) Explain the photoelectron spectrum of oxygen atom. **3**

5) a) Discuss the instrumentation in photoelectron spectroscopy. **3**

b) Describe the functioning of NMR spectrometer with a neat schematic sketch. **5**

c) i) Explain the factors affecting position of signals in NMR spectra. **4**

ii) Analyse the NMR spectrum of ethyl acetate. **3**

Unit – III

6) a) Explain McLafferty rearrangement with suitable example. **4**

b) Discuss the various steps involved in the refining of petroleum. **4**

c) i) Explain thermal cracking. **4**

ii) Describe isotopic ion peak with suitable example. **3**

7) a) Write a note on ring rule. **3**

b) Discuss fixed bed catalytic cracking. **5**

c) i) Give the fragmentation pattern of ammonia molecule showing base peak and isotopic ion peak. **4**

ii) What are petrochemicals ? Give any two applications. **3**

Unit – IV

8) a) Give the method of preparation of DDT and BHC. **4**

b) Elucidate the structure of geraniol. **4**

c) i) Give the synthesis of sulphathiazole and antipyrene. **4**

ii) Discuss the importance of pesticides. **3**

9) a) Describe briefly the health effects of endosulphan. **3**

b) Explain the synthesis of citral. **5**

c) i) How is aspirin prepared ? How it causes 'back diffusion' in stomach ? **4**

ii) Explain the preparation of Bordeaux mixture. **3**
