

Reg. No.

--	--	--	--	--	--	--	--	--	--



BSCCHC 355

**Credit Based VI Semester B.Sc. Degree Examination,
April/May 2017
(2015 – 16 & Earlier Batches Scheme)
CHEMISTRY (Paper – VIII)**

Time : 3 Hours

Max. Marks : 80

- Instructions :**
- 1) Write the question number and subdivisions clearly.
 - 2) Write the equations and diagrams **wherever** necessary.
 - 3) Answer Part – A in the first **two** pages of the answer book.
 - 4) Scientific calculators are **allowed**.

PART – A

1. Answer **any ten** of the following : (2×10=20)
- a) Dipole moment of BF_3 is zero, while that of NH_3 is 1.47D. Why ?
 - b) State Beer – Lambert Law.
 - c) Write Clausius – Mosotti equation and explain the terms.
 - d) Give any two advantages of TMS as a reference compound.
 - e) What is chemical shift ? Give the mathematical formula for calculating chemical shift in scale.
 - f) What is Raman shift ?
 - g) What are nano materials ? Give an example.
 - h) What is meant by misbranding ?
 - i) What are mixed fertilizers ? Give an example.
 - j) What is an active methylene group ? Give an example.
 - k) Define the term iodine value.
 - l) What are syndets ? Give an example.

P.T.O.



PART - B

Answer **any four** questions. Choosing **one** from **each** Unit.

(15×4=60)

UNIT - I

2. a) Describe how is dipole moment measured by temperature method. 4
- b) Explain the different types of electronic transitions that take place when a molecule absorbs uv or visible radiations. 4
- c) i) Explain the terms :
 a) Bathochromic shift. 4
 b) Hypsochromic shift.
 ii) Describe optical activity. 3
3. a) The bond distance in HCl is 1.275Å and observed dipole moment is 1.03D. Calculate the percent ionic character of HCl. 3
- b) Describe diamagnetic, paramagnetic and ferro magnetic properties of substances. 5
- c) i) Explain the selection rule in uv- spectroscopy. What are allowed and forbidden transitions ? 4
- ii) With reasons indicate the increasing order of wavelength of maximum absorption of the following compounds in uv-region of the spectrum.
 a) $\text{H}_2\text{C} = \text{CH} - \text{CH} = \text{CH}_2$
 b) $\text{H}_2\text{C} = \text{CH} - \text{CH}_2 - \text{CH} = \text{CH}_2$
 c) $\text{H}_2\text{C} - \overset{\text{O}}{\parallel} \text{C} - \text{CH}_3$ 3

UNIT - II

4. a) Explain the factors affecting the positions of signals in NMR-spectra. 4
- b) Explain the theory of NMR spectroscopy taking proton as an example. 4
- c) i) Describe the formation of stokes and antistokes lines in Raman spectroscopy. 4
- ii) What is meant by nuclear shielding and deshielding ? 3



5. a) What are the differences between Raman and IR spectroscopy ? 3
b) Explain the functioning of NMR spectrometer with a neat schematic sketch. 5
c) i) What are the informations obtained by the following in NMR spectra ?
a) Number of signals. 4
b) Area under the peak. 3
ii) Give any three advantages of NMR spectroscopy. 3

UNIT – III

6. a) Explain the frost diagram for nitrogen. 4
b) Describe the manufacture of super phosphate of lime and CAN. 4
c) i) Mention the adulterant present and their detection in the following food stuff.
a) Milk b) Sugar. 4
ii) Write the applications of nanomaterials. 3
7. a) Describe chemical method of preparation of nanomaterials. 3
b) Explain the manufacture of cane sugar. 5
c) i) Explain how the adulteration of food can be prevented ? 4
ii) Describe the manufacture of urea. 3

UNIT – IV

8. a) What are soaps ? Explain the cleansing action of soaps. 4
b) Explain the modern theory of colour and constitution. 4
c) i) How do you synthesize
a) Methyl orange b) Alizarin. 4
ii) Explain Keto-enol tautomerism in ethyl acetoacetate. 3
9. a) Give the mechanism of Claisen condensation. 3
b) How dyes are classified on the basis of their applications ? Give an example for each. 5
c) i) Write the differences between soaps and synthetic detergents. 4
ii) Give a method of preparation of Malachite green. 3