



11422

B.Sc. IV Semester Degree Examination, April/May - 2018

CHEMISTRY

Paper - IV

Time : 3 Hours

Maximum Marks : 80

Instructions to Candidates:

- 1) Question paper has **four** sections. All sections are **compulsory**.
- 2) Answer for all sections should be written in the same answer book.

Section - A

(Inorganic, Organic and Physical)

1. Answer any **Ten** of following: (10×2=20)
- a) Define nuclear stability.
 - b) What is meant by artificial radioactivity.
 - c) What are d - block elements?
 - d) Cu^{+2} ions are coloured and Paramagnetic while Zn^{+2} ions are colourless and diamagnetic explain.
 - e) What is meant by lanthanide contraction.
 - f) Write the synthesis of ketones from nitrile
 - g) How is benzoin prepared?
 - h) Write any one method for the preparation of acid chlorides.
 - i) Write the reduction of carboxylic acids.
 - j) Define asymmetric synthesis.
 - k) Define entropy
 - l) State second law of thermodynamics.

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- m) What kind of molecules show vibration spectra?
- n) What is isotope effect?
- o) Define electromagnetic radiation.

Section - B

(Inorganic)

2. Answer any **two** of the following :

(2×4=8)

- a) Explain n/p ratio of nuclear stability.
- b) Explain general properties of d-block elements with respect to colour and magnetic properties.
- c) Discuss the colour and magnetic properties of lanthanide series.

3. Answer any **two** of the following :

(2×6=12)

- a) Write a note on artificial transmutation of elements.
- b) Explain the general properties atomic size, electronic configuration colour and spectra of 3d series.
- c) Describe the separation of lanthanides by ion - exchange method.

Section - C

(Organic)

4. Answer any **two** of the following :

(2×4=8)

- a) Write the aldol reaction with mechanism.
- b) Write any two methods of synthesis of monocarboxylic acids.
- c) What are enantiomers and diastereomers. Give example.

5. Answer any **two** of the following :

(2×6=12)

- a) Explain wolf - Kishner reaction with mechanism.
- b) Write and two methods of synthesis and reactions of amides.
- c) Describe elements of symmetry.



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Section - D

(Physical)

6. Answer any **two** of the following : (2×4=8)
- a) Calculate the change in entropy accompanying the heating of one mole of helium gas, assumed ideal from a temperature of 298 K to a temperature of 1000 K at constant pressure, assuming that $C_v = \frac{3}{2}R$.
 - b) Explain the physical significance of entropy.
 - c) Describe the basic features of different spectrometer.
7. Answer any **two** of the following : (2×6=12)
- a) Describe carnot cycle
 - b) Write a note on Maxwell -Boltzmann distribution.
 - c) Derive an expression for rotational energy levels of a diatomic molecules as rigid rotor.

