PAPER CODE- 52005

University Institute of Engineering & Technology

(Recognised Under Section 2(f) and 12B of UGC)

Kurukshetra University, Kurukshetra

Roll No. -

THEORY EXAMINATION – MAY 2019	
B.TECH – CSE, BT	SEMESTER - II

TIME – 3 Hrs.

M.M. - 75

COURSE NO. - BS-101

COURSE TITLE - Chemistry

Note: All questions in Part-A and Part-B are compulsory. Attempt any four questions from Part-C selecting at least one from each unit.

PART-A (15 Marks)

Q. No. – 1 Answer the following questions. 15x1=15

(i)	Define node with an example of 3p-orbital
(ii)	Why Pauli's exclusion principle is so called
(iii)	Write electronic configuration of N_2^- ion
(iv)	Predict the magnetic nature of Zn^{2+}
(v)	Write electromagnetic spectrum in the increasing order of energy
(vi)	What do you mean by forbidden transition in spectroscopy
(vii)	Define isobestic point
(viii)	How many kinds of protons can be seen in CH_2=CH_2 by NMR spectra
(ix)	What significance is attached with work function
(x)	Out of CH_4, C_2H_4, C_2H_2 which carbon atom has more electronegativity and why
(xi)	Write the following ions in the increasing order of their size; O_2^-, Na^+, Mg^{2+}, F^-
(xii)	Is the entropy of universe constant, comment on it.
(xiii)	Which letters are used before the name of the compounds to show dextro and laevo rotation
(xiv)	What do you mean by resolution of enantiomers
(xv)	Write down the structure of paracetamol.

PART-B (20 Marks)

	UNIT-I	
2	Draw the Pi molecular orbitals of butadiene and explain the important characteristics of these orbitals	5
	UNIT-II	
3	Write a short note on MRI and its important applications	5
	UNIT-III	
4	On what factors ionization energy depends. Explain its variation in a group and also in the second period elements with proper explanation.	5
	UNIT-IV	
5	Write a note on SN^1 and SN^2 reactions with example in each case.	5

PART-C (40 Marks)

	UNIT-I	
6	(i) On the basis of Band theory differentiate between conductors, insulatots and semi conductors (ii) Write a short note on aromaticity	5+5
7	What is crystal field splitting and CFSE. Draw and explain the energy level diagram of $[Co(NH_3)_6]Cl_3$ and magnetic properties of this compound.	10
	UNIT-II	
8	Write on the following (a) Absorption spectra (b) Bathochromic shift (c) Scattering (d) selection rules	10
9	(i) Explain the principle of NMR spectroscopy (ii) Why TMS is used as a reference in NMR spectroscopy (iii) Expalin the meaning of shielding and deshielding of protons in NMR spectroscopy (iv) Write the applications of fluorescence in medicine	10
	UNIT-III	
10	(i) For a cell reaction $Ni/Ni^{2+} \parallel Ag+/Ag$ calculate equilibrium constant at 25°C and also the maximum work obtained by operation of this cell. ($E°\ Ni^{2+}/Ni = -0.25V$ and $E°\ Ag^{+}/Ag = 0.80V$) (ii) Draw an expression for entropy change in isothermal and isobaric processes.	5+5
11	(a) What you mean by polarization, polarizing power and polarisability. Explain Fajan's rule of polarisation (b) Write important points of VSEPR theory and on the basis of it explain the structure of NH_3 molecule.	10
	UNIT-IV	
12	(i) What is stereoisomerism. What are its different types (ii) Write a short note on diastereomers (iii)Explain CIP rules of absolute configuration with examples	2+4+4
13	Write on the following: cyclisation reactios, E_1 and E_2 reactions, synthesis of Aspirin	3+4+4