CLASS: IMSC   SEMESTER : I
BRANCH: MATH & COMP./PHYSICS   SESSION : MO/18

SUBJECT: CH111 CHEMISTRY-I

TIME: 3.00 HOURS   FULL MARKS: 50

INSTRUCTIONS:
1. The question paper contains 5 questions each of 10 marks and total 50 marks.
2. Attempt all questions.
3. The missing data, if any, may be assumed suitably.
4. Before attempting the question paper, be sure that you have got the correct question paper.
5. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.


Q.1(a)   State Pauli Exclusion principle and validate the same with the two electrons of Helium atom.   [5]
Q.1(b)   Write the expression for de Broglie matter wave and prove its applicability to microscopic and   [5]
         macroscopic world.

Q.2(a)   Rationalize the melting point trend of the alkali metal fluorides: LiF (845°C), NaF (995°C), KF   [5]
         (856°C), RbF (775°C), CsF (682°C).
Q.2(b)   Find the state of hybridization of the central atom and draw the structure of the following: PCl_5,   [5]
         $SiCl_4$, SF_6, NH_4^+, BF_3

Q.3(a)   Write down the IUPAC name for the following compounds: [5]

i)   ii)   iii)   iv)   v)
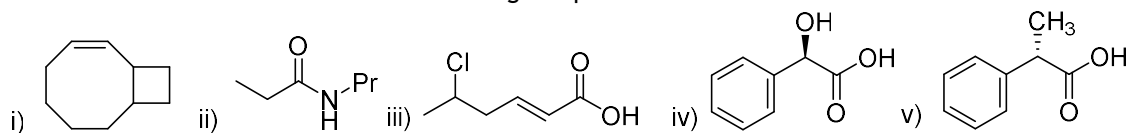
Q.3(b)   i) Explain the fact that polar protic solvent favour S_N1 reaction. Explain & Identify the   [5]
         reagent/conditions for the path-A and B for the following reaction.
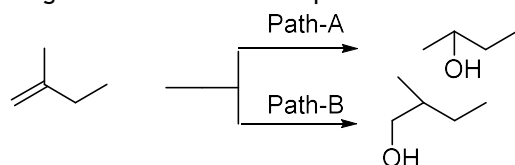
Q.4(a)   Predict the magnetic property of O_2, O_2^- and O_2^{2} using Molecular orbital theory. ⁻   [5]
Q.4(b)   Calculate the radius ratio for the tetrahedral Zinc blend structure.   [5]

Q.5(a)   Explain the term optical activity and chirality with the examples of distinguished stereochemical   [5]
         structure.
Q.5(b)   Convert the following Sawhorse formula to Newman and to Fisher Projection Formula. Identify R/S,   [5]
         D/L and Erythro/Threo Isomerism using its Fisher Projection Formula.