**Tutorial Sheet**

**Atomic Structure and Bonding**

**Dr. Ranjit Kumar**

1. Give the electron configurations for the following ions:

Fe2+, Al3+, Cu+, Ba2+, Br−, and O2−.

1. For the K shell, the four quantum numbers for each of the two electrons in the 1s state, in the order of n, l, ml, ms are 1,0,0,1/2 and 1,0,0,−1/2. Write the four quantum numbers for all of the electrons in the L and M shells, and note which correspond to the s, p, and d subshells.
2. Determine whether each of the following electron configurations is an inert gas, a halogen, an alkali metal, an alkaline earth metal, or a transition metal. Justify your choices.



1. Compute the % ionic character of the interatomic bond for each of the following compounds: TiO2, ZnTe, CsCl, InSb, and MgCl2. The standard electron negativity can be obtained from google. The electron negativity values will be provided in the exam.
2. What type(s) of bonding would be expected for each of the following materials: brass (a copper-zinc alloy), epoxy, barium sulfide (BaS), solid xenon, bronze, nylon, and aluminum phosphide.
3. (a) Briefly cite the main differences among ionic, covalent, and metallic bonding.

(b) State the Pauli exclusion principle.

1. What are secondary bondings, explain using examples?