Home Assignment

Total Marks-20

Atomic Structure (CO-1)

1. Discuss the Linear combination of atomic orbital (LCAO) on behalf of *p*-atomic orbitals. **2**
2. Compare the bond order of O_2, O_2^+, O_2^{2+} and O_2^- from MOT electronic configuration. **2**
3. Draw the MOT energy profile diagram for CO and NO. Also calculate their bond order and comment on their magnetic behaviour. **4**
4. "Liquid Oxygen is attracted by a pole of magnet but not liquid nitrogen." Why? **2**

Instrumental Methods of Chemical Analysis (CO-4)

1. What do you mean by Electromagnetic radiation? How do the wavelengths and frequencies of different types of electromagnetic radiation vary? **3**
2. "A conjugated diene absorbs at higher wavelength as compared to a diene in which double bonds are isolated." Why? **3**
3. How hydrogen bonding changes the position of absorption in IR spectroscopy? **2**
4. Define the term chemical shift. How does the aromaticity influence the chemical shift value in ^{1}H-NMR. **2**

Instructions:

- Write your **name, roll number, branch and date of submission** on the cover page.
- Submit it on or before 21st January, 2023.