

- b) Explain particles in one dimensional box. (7)
- Q-4** **Attempt all questions** (14)
- a) Draw Orgel diagrams for D and F term and write corresponding transitions. (7)
- b) Explain particles in three dimensional box. (7)
- Q-5** **Attempt all questions** (14)
- a) Explain pigeon hole diagram for p^2 configuration. (7)
- b) Discuss the structure of $Ni(CO)_4$. (7)
- Q-6** **Attempt all questions** (14)
- a) Explain trans effect. Prepare cis platin and trans platin from $[PtCl_4]^{2-}$. (7)
- b) Write a note on addition and subtraction of the operator, multiplication of the operator and linear operator. (7)
- Q-7** **Attempt all questions** (14)
- a) Write preparation methods of metal carbonyls. (7)
- b) Derive the spectral terms for d^2 configuration and decide the ground spectral term. (7)
- Q-8** **Attempt all questions** (14)
- a) Write chemical properties of metal carbonyls. (7)
- b) Write a note on Commutators. Prove that $[d/dx, 3x^2] \neq 0$ when $f(x) = \sin x$ (7)

