VII. Explain electronic spectra of spin free and spin paired ML_6^{n+} complexes. 8½

VIII. (a) Discuss magnetic properties of square pyramidal complexes. 4

(b) Discuss spectral properties of dodecahedral complexes. 4½

SECTION—C

IX. (a) What is lattice energy ?

(b) Why is $KMnO_4$ coloured ?

(c) What is Laporte rule ?

(d) What do you mean by bandwidth ?

(e) What is difference between crystal field and ligand field ?

(f) What is nephelauxetic series ?

(g) Predict magnetic behaviour of $Ni(CO)_4$.

(h) What are term wave functions ?

(i) How will you evaluate 10 Dq ? Give examples.

(j) What are advantages of Tanabe Sugano diagrams ?

(k) Give examples of metal to ligand charge transfer spectra.

$11 \times 2 = 22$

PC 13098-N

L-3/2111
LIGAND FIELD THEORY—311
Semester—III

Time Allowed : Three Hours]   [Maximum Marks : 55

Note :– The candidates are required to attempt *two* questions each from Section A and B. Section C will be compulsory.

SECTION—A

I. Explain concept of ligand field. What is its scope ? Also explain physical properties affected by ligand field. 8

II. Discuss briefly crystal field theory and explain the effect of octahedral crystal field potential on d wave functions. 8

III. Write notes on :

(a) Spin orbit coupling 4

(b) Crystal field stabilisation energy. 4

IV. Explain the effect of cubic crystal field on SPDF, terms. 8

SECTION—B

V. Draw and discuss Tanabe Sugano diagram for high spin and low spin octahedral d^7 complexes. 8½

VI. Explain bonding in tetrahedral complexes with the help of molecular orbital theory. 8½