(b) Describe Isomer shift and quadrupole effect in Mossbauer spectroscopy. **10**

Unit IV

7. Write a short note on Molecular luminiscence. Explain the terms-Fluorescence, Phosphorescence and chemiluminescence using Jablonski diagram. **20**

8. (a) Discuss Beer-Lamberts law for quantitative application. **10**

(b) Give explanation of Frank-condon principle. **10**

CC-291

M. Sc. EXAMINATION, Dec. 2018

(Third Semester)

(Main & Re-appear)

CHEMISTRY

CH610B

Inorganic Special-I (Spectroscopy Techniques)

Time : 3 *Hours*] [*Maximum Marks :* 100

Before answering the question-paper candidates should ensure that they have been supplied to correct and complete question-paper. No complaint, in this regard, will be entertained after the examination.

Note : Attempt *Five* questions in all, selecting at least *one* question from each Unit. All questions carry equal marks.

Unit I

1. (a) Explain the principle and instrumentation of Atomic absorption spectroscopy. **12**

(b) Discuss the spectral and chemical interfaces and their removal. **8**

2. Explain the following :

(i) Inductively complete plasma **4**

(ii) Applications of advantages of AES in reference to detection limit **8**

(iii) Excitation sources used in AES. **8**

Unit II

3. (a) Explain the principle of ESR spectroscopy. Predict the ESR spectrum of Cu^{+2} in frozen aqueous solution (Use I = 3/2). **10**

(b) Discuss the significance of 'g' in EPR. What are the various factors that affect g-value. **10**

4. (a) Explain the following terms in EPR :

(i) Zero field splitting

(ii) Krammer's degeneracy

(iii) Derivative representation of spectra. **4,2,4**

(b) Briefly discuss the following :

(i) Hyper fine coupling

(ii) Use of ESR in electron exchange reaction rates. **7,3**

Unit III

5. (a) On the basis of relative isotopic abundance of halogens, predict the Mass spectrum of $CH_3CBr_2CH_2Cl$ and $CHCl_3$.

(b) Write a short note on FAB, CI and magnetic sector analyser used in MS. **7,13**

6. (a) Explain the applications of Mossbaeur spectroscopy to study the bonding and structure of Fe^{+2}, Fe^{+3} : Sn^{+2}, Sn^{+4} compounds using appropriate examples. **10**