




المستوى الثالث
كيمياء / علم حشرات

	TANTA UNIVERSITY FACULTY OF SCIENCE DEPARTMENT OF CHEMISTRY			
	FINAL EXAMINATION FOR ALL DOUBLE MAJOR THIRD LEVEL STUDENTS			
	COURSE TITLE:	<u>(Coordination Chemistry)</u>		COURSE CODE: CH3246
DATE:	1, JUNE 2017	TERM: SECOND	TOTAL ASSESSMENT MARKS 50	TIME ALLOWED: 2 HOURS

Answer the following Questions:

1-) For each complex define the following: (Total marks 20)

- | | |
|---|--|
| 1- Name | 2- The type of isomerism |
| 3- The type of hybridization | 4- Calculate the magnetic moment |
| I-) $[\text{Mn}(\text{H}_2\text{O})_6]\text{Cl}_2$ (5marks) | II-) $\text{K}_2[\text{Zn}(\text{CN})_4]$ (5marks) |
| III-) $\text{K}_2[\text{Ni}(\text{NO}_2)_4]$ (5marks) | IV-) $\text{Na}_3[\text{CoCl}_6]$ (5marks) |

2-) A-) Iron ion forms an inner diamagnetic complex ion containing the cyano ligand. Derive the formulae of the complex. (4marks)

B-) Discuss the effect of central metal ion and its charge on Δ_o value. (4marks)

C-) Manganese (II) ion forms inner complex ion with cyano ligands. Calculate the magnetic moment value of the complex. (4marks)

D-) Discuss the hydration isomerism with example. (3marks) (Total marks 15)

3-) A-) Write full account on Jahn-Teller effect with examples (5marks)

B-) What is the formula of the following complex: (2marks)
Tetrammine copper (II) hexachloro copperate (II)

C-) For the two complexes: 1-) Hexammine cobalt(III) chloride (8marks)

2-) Potassium hexacyano ferrate (II)

a-) Draw the d-orbital splitting indicate the number of electrons in t_{2g} and e_g

b-) Calculate the CFSE value and magnetic moment for each complex. (Total marks 15)


Note : (Atomic number for Mn 25, Fe 26, Co 27, Ni 28, Cu 29 & Zn 30)

Good Luck

Examiners: Prof. Dr : Kamal Elbaradie, Prof. Dr: Ekhlal Abd Elhay

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Final Examination of for third year students (Double major)

	COURSE TITLE	Organic Spectroscopy	COURSE CODE: CH3248
DATE: JUN. 2017	TERM: SECOND	TOTAL ASSESSMENT MARKS: 100	TIME ALLOWED: 2 HOURS

Answer the following questions: (100 marks) (Each question 20 marks)

1] a) Discuss the chemical shift of hydrogen attached directly to a Π -bonded carbon and give the relative order of downfield shift of:

Acetylenic, vinylic, aldehydic and aryl hydrogen compared to alkyl hydrogens.

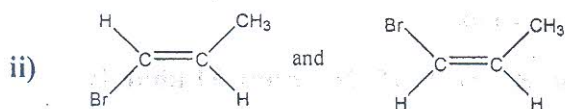
b) Is the δ value of a given kind of hydrogen proton a constant value? Find the δ value and the observed shift from TMS in HZ of a signal in a 100-MHZ instrument? That is 162 HZ in a 60-MHZ instrument.

2] a) Draw the ^1H NMR spectra with multiplicity, peak accounting and showing relative chemical shifts for the following structures:



b) Use ^1H NMR spectroscopy to distinguish between the following geometric isomers:

i) Cis-stilbene and trans-stilbene.



3] a) 4-Heptanone shows two important characteristic peaks in its mass spectrum due to ions at $m/e = 86$ and $m/e = 58$. Explain the fragmentation pattern of the compound.

b) How do you explain that $m/e = 57$ and $m/e = 44$ ions is formed in the mass spectrum of pentanal.

c) Give the typical fragmentation pattern in n -propyl benzene.

4] Explain the following by using the mentioned spectroscopic methods:

a) o -Nitroacetanilide is deep yellow but the p -nitroacetanilide is yellow (UV & IR).

b) The ketonic and enolic forms of ethyl benzoyl acetate (UV, IR and ^1H NMR).

