UNIVERSITY OF THE PUNJAB

Seventh Semester 2017
Examination: B.S. 4 Years Programme

Roll No. .....

PAPER: Inorganic Chemistry (Sp. Theory-I) **TIME ALLOWED: 2 hrs. & 30 mins.**
Course Code: CHEM-406 UA **MAX. MARKS: 50**

Attempt this Paper on Separate Answer Sheet provided.

Q. 2. Answer following short questions. **(2 × 10 = 20)**

(i) Draw correlation diagram for d^2 and d^8 octahedral and tetrahedral complexes.
(ii) Write two points of differences between VBT and MOT.
(iii) Describe classification of organic reagents used in inorganic analysis.
(iv) What is 3c – 4e electron bond? Give one example.
(v) What is diagonal relationship? Give two similarities between Li and Mg.
(vi) What is s – inert pair effect?
(vii) Why BF_3 is more stable than BH_3?
(viii) Describe application of organic reagents in chromatographic analysis as locating agents.
(ix) Why does fluorine show peculiar behavior in group VIIA?
(x) Why PF_3 exists whereas NF_3 does not?

Q. 3. Answer all of the following questions **(3 × 10 = 30)**

(i) How is correlation diagram approach is applied for triatomic molecules to determine the shape of the molecules? (10)
(ii) Describe some methods to increase the specificity of the organic reagents? (10)
(iii) a) Discuss periodic anomalies of nonmetals (5)
b) Write diagonal relationship between boron and silicon. (5)

UNIVERSITY OF THE PUNJAB

Seventh Semester 2018
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Roll No. .....

PAPER: Inorganic Chemistry (Sp. Theory-I) **TIME ALLOWED: 2 hrs. & 30 mins.**
Course Code: CHEM-406 **MAX. MARKS: 50**

Attempt this Paper on Separate Answer Sheet provided.

Q. 2. Answer following short questions. **(2 × 10 = 20)**

i. What are Chelates?
ii. Mention four points of similarity between VBT and MOT?
iii. What is 's – inert pair effect'?
iv. Give two uses of 8-Hydroxyquinoline in inorganic analysis.
v. What is 3c – 2e (three center t
vi. wo electron) bond? Give one example.
vii. Why does Fluorine show peculiar behavior in group VIIA?
viii. Explain why PF_5 exist but NF_5 does not exist?
ix. Write two advantages and two drawbacks of VSPER theory?
x. Name factors that can affect sensitivity, selectivity, and specificity of an organic reagent?

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Q. 3. Answer following questions. **(3 × 10 = 30)**

i. Explain use of "d" orbital in bonding by non-metals with some examples. (10)
ii. Write a note on the EDTA titrations. (10)
iii. How correlation diagram approach is applied for triatomic molecule to determine the shape of the molecules? (10)

UNIVERSITY OF THE PUNJAB

Seventh Semester – 2019

Examination: B.S. 4 Years Program

Roll No. .....

PAPER: Inorganic Chemistry (Sp. Theory-I)
Course Code: CHEM-406 Part – II UA

MAX. TIME: 2 Hrs. 45 Min.
MAX. MARKS: 50

ATTEMPT THIS (SUBJECTIVE) ON THE SEPARATE ANSWER SHEET PROVIDED

Q. 2. Answer following short questions. **(2 × 10 = 20)**

(i) Give two failures of Valence Bond theory.
(ii) What are physical states of different halogens at room temperature and why these are different?
(iii) Which type of bonding is stronger between pπ – pπ and dπ – pπ and why?
(iv) Give the structure of diborane molecule. What type of a bond explains its structure?
(v) What are amphoteric oxides? Give one example.
(vi) What is s – inert pair effect?
(vii) Name different organic reagents used as indicators in acid-base titrations?
(viii) Name various types of organic reagents (other than indicators) used in analysis?
(ix) How chelates can be classified?
(x) What are complexometric titrations?

Q. 3. Answer following questions. **(3 × 10 = 30)**

(i) Discuss pπ – pπ bonding in the heavier congeners of group IVA. (10)
(ii) Brief the role of organic reagents in different analytical techniques. (10)
(iii) Explain use of "d" orbital in bonding by non-metals with few examples. (10)

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B.S. 4 Years Program : Seventh Semester – 2020

Roll No. .....

Paper: Inorganic Chemistry (Sp. Theory-I) **Time: 2 Hrs. 45 Min. Marks: 50**

Course Code: CHEM-406 **Part – II**

ATTEMPT THIS (SUBJECTIVE) ON THE SEPARATE ANSWER SHEET PROVIDED

Q.2. Give short answers of the following: **(10x2=20)**

(i) Write two drawbacks of VSEPR theory
(ii) Discuss one experimental evidence for dπ – pπ.
(iii) Mention two differences between hybrid orbital and molecular orbital.
(iv) What is 3c – 4e electron bond? Give one example.
(v) Give two similarities between Li and Mg.
(vi) What is s – inert pair effect?
(vii) Why BH_3 is less stable than BF_3?
(viii) Why is buffer used in EDTA titrations?
(ix) How can chelates be classified?
(x) Brief acid base indicators?

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Q.3. Answers the following questions. **(3x10=30)**

i. Discuss periodic anomalies of non-metals and post transition metals.
ii. a) Briefly discuss stereochemistry with few examples.
b) Write a brief note on Directed Valence Theory.
iii. Describe some methods to increase the specificity of the organic reagent.

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B.S. 4 Years Program : Seventh Semester – Fall 2021

Roll No. UA.....

Paper: Inorganic Chemistry (Sp. Theory-I) UA **Course Code: CHEM-406** **Time: 3 Hrs. Marks: 60**

Q.1. Answer the following short questions: (15x2=30)

(i) How does VBT differ from MOT?
(ii) How does stability of chelate depend upon the nature of ligand?
(iii) Write two similarities between Be and Al.
(iv) Which indicators are used in EDTA titration?
(v) What is inert pair effect? Give an example.
(vi) $SiCl_4$ reacts with water while CCl_4 does not? Justify it.
(vii) Why NF_5 molecule does not exist?
(viii) Give classification of organic reagents used in inorganic analysis.
(ix) Give four similarities between Li and Mg.
(x) What is 3 center – 2 electron bond? Give one example.
(xi) Name different organic reagents used as indicators in acid – base titration.
(xii) Why is BF_3 more stable than BH_3?
(xiii) What are Chelates? Give two examples.
(xiv) Draw structure of $[Mg - EDTA]^{-2}$
(xv) Write physical state of halogens at room temperature and why they are different?

Q.2. Answer the following questions. (3x10=30)

i) **(a)** Explain Walsh diagram for Water molecule. **(5)**
(b) What are the main discrepancies of VSEPR and VBT? **(5)**

ii) Give the theoretical arguments and experimental evidences in the favor of d – orbital participation of non – metals. **(10)**

iii) Describe chemistry of Rubeanic Acid and Pyrogallol in detail. **(10)**

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B.S. 4 Years Program / Seventh Semester – Fall 2022

Paper: Inorganic Chemistry (Sp. Theory-I) Course Code: CHEM-406

Roll No. 34535

Time: 3 Hrs. Marks: 6

THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED

UA

Q.1. Answer the following short questions: (15x2=30)

i. What are major drawbacks of directed valence theory?
ii. Why is a disodium salt of EDTA prepared?
iii. How can chelates be classified?
iv. Why is BF_3 more stable than BH_3?
v. Define stereochemistry with few examples.
vi. What is a $d\pi - p\pi$ bond? Give example.
vii. What is the difference between a hybrid orbital and a molecular orbital?
viii. What kind of a relationship is present between Li and Mg? Brief.
ix. What different types of organic reagents are used?
x. What are the factors that affect sensitivity and selectivity of an organic reagent?
xi. Write few properties of chelates.
xii. What is a 3 center – 2 electron bond? Give one example.
xiii. What kind of stability is observed in chelates?
xiv. Write two advantages of VSEPR theory?
xv. What is a 3 center – 4 electron bond? Give one example.

Q.2. Answer the following questions. (3x10=30)

(i) Explain use of "d" orbital in bonding by non-metals with some examples.
(ii) Write a note on the EDTA titrations.
(iii) How is correlation diagram approach applied for triatomic molecule to determine the shape of t molecules?