2020
B.Sc. Semester 3 Examination
University of Calcutta
Computer Sc. – HONOURS
Paper : CC5
F.M. 30

FAKIR CHAND COLLEGE CENTRE(551)

Q.1 Answer ANY FOUR questions. 1X4

a) What do you mean by Crystal field stabilization energy?

b) What is lanthanide contraction?

c) Why is $KMnO_4$ intensely purple coloured? Explain.

d) The lanthanide elements show the common stable oxidation state of +3. Comment.

e) What are Racah parameters?

g) What is trans effect?

Answer ANY THREE from Question Nos. 2-6 questions.

Q.2 a) Construct the Orgel diagram for a high spin $[CoL_6]^{2+}$ complex and mention the probable transitions. 4

b) $[PtCl_4]^{2-}$ is square planar whereas $[NiCl_4]^{2-}$ is tetrahedral. Comment. 3

Q.3 a) Explain briefly the principle of separation of lanthanides by ion exchange method. 4

b) Atomic radii of Nb and Ta are almost identical. Explain. 3

Q.4 a) How can you prepare cis- and trans- isomers of $[Pt(C_2H_4)Cl_2(NH_3)]$ from $K_2[PtCl_4]$ by using trans effect ? 4

b) What do you mean by thermodynamic stability and kinetic stability of a complex? 3

Q.5 a) Compare Cu, Ag and Au with respect to stability of their oxidation states. 4

b) Usually colourful complexes are observed in actinide series while most of the lanthanide complexes are colourless. Justify. 3

Q.6 a) "On addition of Conc. HCl to an aqueous solution of Cobalt (II), a deep colour results" - Explain the observation in light of electronic spectra. 4

b) Position of CO in the spectrochemical series is higher than CN^- . Explain. 3

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Paper : CC6
F.M. 30

FAKIR CHAND COLLEGE CENTRE(551)

Q.1 Answer ANY FOUR questions. 1X4

f) What do you mean by Crystal field stabilization energy?

g) What is lanthanide contraction?

h) Why is $KMnO_4$ intensely purple coloured? Explain.

i) The lanthanide elements show the common stable oxidation state of +3. Comment.

j) What are Racah parameters?

g) What is trans effect?

Answer ANY THREE from Question Nos. 2-6 questions.

Q.2 a) Construct the Orgel diagram for a high spin $[CoL_6]^{2+}$ complex and mention the probable transitions. 4

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Q.5 a) Compare Cu, Ag and Au with respect to stability of their oxidation states. 4

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Paper : CC7
F.M. 30

FAKIR CHAND COLLEGE CENTRE(551)

Q.1 Answer ANY FOUR questions. 1X4

k) What do you mean by Crystal field stabilization energy?

l) What is lanthanide contraction?

m) Why is $KMnO_4$ intensely purple coloured? Explain.

n) The lanthanide elements show the common stable oxidation state of +3. Comment.

o) What are Racah parameters?

g) What is trans effect?

Answer ANY THREE from Question Nos. 2-6 questions.

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Q.5 a) Compare Cu, Ag and Au with respect to stability of their oxidation states. 4

b) Usually colourful complexes are observed in actinide series while most of the lanthanide complexes are colourless. Justify. 3

Q.6 a) "On addition of Conc. HCl to an aqueous solution of Cobalt (II), a deep colour results" - Explain the observation in light of electronic spectra. 4

b) Position of CO in the spectrochemical series is higher than CN^- . Explain. 3

2020
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Paper : SEC
F.M. 30

FAKIR CHAND COLLEGE CENTRE(551)

Q.1 Answer ANY FOUR questions. 1X4

p) What do you mean by Crystal field stabilization energy?

q) What is lanthanide contraction?

r) Why is $KMnO_4$ intensely purple coloured? Explain.

s) The lanthanide elements show the common stable oxidation state of +3. Comment.

t) What are Racah parameters?

g) What is trans effect?

Answer ANY THREE from Question Nos. 2-6 questions.

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