

(4)

(x) $[\text{Mn}(\text{H}_2\text{O})_6]^{2+}$ is strongly paramagnetic where as $[\text{Mn}(\text{CN})_6]^{3-}$ is only weakly so.

$[\text{Mn}(\text{H}_2\text{O})_6]^{2+}$ ॥yeue Deve ॥geyekeâ॥e nw peyeekeâ
 $[\text{Mn}(\text{CN})_6]^{3-}$ keâcepeej xhe mes Smea nw

Unit - I

FkeâF&- I

2. What are transition elements? How they are called so? Discuss the general characteristics of transition elements with respect to the following :

2½+5

meâceCe telJe keâlee nP FvnWmeâceCe telJe keâleelkeâlnles nP
efcveedueKele keâ mevoY&cellmeâceCe telJelW meeceevDe iofcellkeâe
eljelevee keâepeS :

(i) Electronic configuration

Fukeâeefekâa effeUeme

(ii) Magnetic properties

Uegyekââde iefje

(iii) Complex formation

mekeâue Uenfekâelkeâe yeveeve

A

(Printed Pages 8)

Roll No. _____

S-622

B.Sc. (Part-II) Examination, 2015

CHEMISTRY

First Paper

(Inorganic)

Time Allowed : Three Hours] [Maximum Marks : 50

Note : Answer five questions in all, including Question No. 1, which is compulsory and one question from each unit.

Qmve mba 1 Deefjeel&nP Fmekâesefeuuekaj keâue heâle Qmve
keâ Goej oopeS telLee telUekâ FkeâF&mes Skeâ Qmve keâepeS-

1. Do as directed : $2 \times 10 = 20$

efeoMeevegeej keâepeS :

(i) Giving reason state whether the following statement is true or false.

"The greater is the standard electrode potential of an electrode, the stronger the

P.T.O.

(2)

reducing agent it is".

keajej Ce oſes nſ ūen yelēeFūes ekā De0eesuekKele ūekeāLeve
melūe nwūee Demelūe :
ekāmeer Fuetſe[keaje ceeveka Fuetſe[eſeYej eſeleye De0Dekeā
neſee nw Jen Glevee ner ūeyeu Deheūeukeā neſee nw

- (ii) Of the two La(OH)_3 and Lu(OH)_3 which is more basic and why?

La(OH)_3 ſJeced Lu(OH)_3 cellimes keāne De0Dekeā #eej ejē
nw Deej keſeP

- (iii) Why First Ionization energies of 5d elements are higher than those of 3d and 4d elements?

5d TeōJeellkeār ūeLece Deeūeukeā Tpe& ſJeced 4d TeJeeWme
keſeP De0Dekeā neſee nP

- (iv) Which of the following will behave as an acid in liquid sulphur dioxide and why?

K_2SO_3 , SOCl_2 , $\text{SO}(\text{CNS})_2$, CaSO_3
eſeveyekeeKele cellimes keāne ūje meulkeaj [eFDekeāneF[cel
Deue keār lej n Jūelenej keaj ſee Deej keſeP
 K_2SO_3 , SOCl_2 , $\text{SO}(\text{CNS})_2$, CaSO_3

(3)

(v) Why Lanthanides do not form oxycations?

ueLeveeF[me Dekeāne ūeLevee keſeP veveRyeveeles nP

- (vi) Why do Actinides exhibit +4, +5 and +6 oxidation state whereas Lanthanides exhibit a maximum of +4 oxidation state?

SkeſeP[the ekāmeueS +4, +5 ſJeced +6 Dekeānekeāj keā
DeJemLee ūeLevee keaj lesnw peyekā ueLeveeF[me De0Dekeālece
+4 Dekeānekeāj keā DeJemLee ūeLevee keaj les nP

- (vii) $[\text{Co}(\text{NH}_3)_6]^{3+}$ ion is diamagnetic while $[\text{CoF}_6]^{3-}$ ion is paramagnetic explain?

$[\text{Co}(\text{NH}_3)_6]^{3+}$ ūeLevee hej eūegekeāLe nw peyekā
 $[\text{CoF}_6]^{3-}$ ūeLevee Deveg ūegekeāLe nw keſeP

- (viii) Which one of the two cobalt ions Co^{2+} and Co^{3+} should be better oxidising agent and why?

Co^{2+} ſJeced Co^{3+} keāyeue ūeLevee cellimes ekāmekeā
DeJUe Dekeānekeāj keā Deeūeukeākeā neſee ūeefnS Deej keſeP

- (ix) How is free energy change related to the standard potential.

cejēā Tpe&Delej ceeveka eſeYej mes keāmes mecyef/0ele nP

(8)

Unit - IV

Fka&F&- IV

8. Which parameters of a liquid determine its use as non-aqueous solvent? Discuss various kinds of reactions that are studied in liquid sulphur dioxide or liquid ammonia. $2\frac{1}{2} + 5$

ekâneer òJe keâ keâne mesiege Gmekâ efepele effeuekeâ keâ Devefjeesie keâes effeefj le keaj les nq òJe meufkeâ [eFDekeâneF[DeLejâe òJe Deceefjeesie cellDe0ÙeÙeve keâr pêvesJeeuefelâl/le j emeefjeefkeâ efâÙeDeel keâ JeCelle keâefpeS-

9. Write short notes : $3\frac{1}{2} + 4$

meffehle esheCeer efekKeS :

- (i) Standard electrode potential and electrochemical series.

cevekeâ Fukeâ[effeYele Sjecd Jefje j emeefjeefkeâ BeCe

- (ii) The Lux-Flood concept of acids and bases.

DecueWDeej #ej ejWkeâr uekâne-Hâe[mekeâuhevee

(5)

- (iv) Variable oxidation state

hej ejeleea Deekânekeâj Ce mefÙee

- (v) Catalytic property

Gfâj keâ ieße

3. Why do the elements of second transition series resemble closely with the respective group, members of third series but differ from those in first transition series? Point out similarities between elements in Zr|Hf or Nb|Ta. $7\frac{1}{2}$

eFleelâe mekeâceCe BeCeer keâ leJe, lefleelâe mekeâceCe BeCeer keâ meomÙeel mesDeeDekeâ meceevle keâleelâoMeekâ nwp eyedkeâ feLece mekeâceCe BeCeer keâ mecejeefle meomÙeelmesefle nP Zr|Hf DeLejâe Nb|Ta Uejceel celWoegeWleJeeWkeâ ce0Ùe meceevleelDeelWkeâs Ffiele keâj W

Unit - II

Fka&F&- II

4. Describe the various rules used for the nomenclature of complex compounds. Give IUPAC names and E.A.N. of Central atom in the following compounds. $2\frac{1}{2} + 5$

(6)

- (i) $[\text{Ag}(\text{CN})_2]\text{Cl}$
- (ii) $\text{K}[\text{Pt}(\text{NH}_3)\text{Cl}_5]$
- (iii) $\text{K}_3[\text{Fe}(\text{CN})_6]$
- (iv) $\text{Na}_3[\text{Co}(\text{NO}_2)_6]$
- (v) $[\text{Co}(\text{NH}_3)_6]\text{Cl}_3$

peſſue ŸeenfkeāelWkeā Deef&Uet heer S.mer. headele mes veeckeaj Ce keā
efveJeeceWkeāe JeCelle keāeſpeſ~ efvecveſueKele eemfkeāelWkeāe
Deef&Uet heer S.mer. veee teLee keāvōdte Oeleg keā Deveejer hej ceeCe
keāer ieCevee keāeſpeſ~

- (i) $[\text{Ag}(\text{CN})_2]\text{Cl}$
- (ii) $\text{K}[\text{Pt}(\text{NH}_3)\text{Cl}_5]$
- (iii) $\text{K}_3[\text{Fe}(\text{CN})_6]$
- (iv) $\text{Na}_3[\text{Co}(\text{NO}_2)_6]$
- (v) $[\text{Co}(\text{NH}_3)_6]\text{Cl}_3$

5. Discuss with suitable examples the various type of isomerism in coordination compounds.

GheJegēa Goenj CeeWmeefnle Ghemenmdeſepekeā ŸeenfkeāelWceWdeelVeve
ſkeāej keāer meceejJeJeleDeelWkeāe JeCelle keāeſpeſ~

7 ½

(7)

Unit - III

FkeāeF&- III

6. Give electronic configuration of Lanthanides and justify their position in the periodic table explain lanthanides contraction and its consequences.

7 ½

Fukeſſeſekeāe effveeeme oſesnſ Deelēmeej Ceer ceſſueLeveeF [the keā
efLede keāes Geſeſe "nj eFūes ueſLeveeF [mekejDeve SJeced Fmekeā
hefj CeceelWkeāer JÜeeKÜee keāeſpeſ~

7. Point out similarities and differences between lanthanides and Actinides. Describe through flow sheet diagram for the separation of Neptunium (Np) and plutonium (Pu) from Uranium ($_{92}\text{U}^{238}$).

7 ½

uerLeveeF [the SJeced SkeſſeveeF [me keā ce0Üe meceevelēe Je eVelēe
Fhele keāej Ÿej ſreJeece ($_{92}\text{U}^{238}$) mesvüteJeece (Np) teLee
hutſſevee (Pu) keā hekeāej Ce keāer Ÿejen Meſ Ÿeje JÜeeKÜee
keāeſpeſ~