Member of 5d series :-

	Electronic Configuration.
Lanthanum ($_{57}La$)	$[Xe]\ 6s^2 5d^1$
Hafnium ($_{72}Hf$)	$[Xe]\ 4f^{14} 6s^2 5d^2$
Tantalum ($_{73}Ta$)	$[Xe]\ 4f^{14} 6s^2 5d^3$
Tungsten ($_{74}W$)	$[Xe]\ 4f^{14} 6s^2 5d^4$
Rhenium ($_{75}Re$)	$[Xe]\ 4f^{14} 6s^2 5d^5$
Osmium ($_{76}Os$)	$[Xe]\ 4f^{14} 6s^2 5d^6$
Iridium ($_{77}Ir$)	$[Xe]\ 4f^{14} 6s^2 5d^7$
Platinum ($_{78}Pt$)	$[Xe]\ 4f^{14} 6s^1 5d^9$
Gold ($_{79}Au$)	$[Xe]\ 4f^{14} 6s^1 5d^{10}$
Mercury ($_{80}Hg$)	$[Xe]\ 4f^{14} 6s^2 5d^{10}$

6d-series $\longrightarrow {}_{89}Ac^{*} - [\ {}_{104}Rf \ldots\ldots\ldots\ldots\ ]$ Incomplete series.

Properties of d-block elements or Transition Metal :-

Member of 3d series :-

	electronic Configuration
Scandium ($_{21}Sc$) –	$[Ar]\ 4s^2 3d^1$
Titanium ($_{22}Ti$)	$[Ar]\ 4s^2 3d^2$
Vanadium ($_{23}V$)	$[Ar]\ 4s^2 3d^3$
Chromium ($_{24}Cr$)	$[Ar]\ 4s^1 3d^5$
Manganese ($_{25}Mn$)	$[Ar]\ 4s^2 3d^5$
Iron ($_{26}Fe$)	$[Ar]\ 4s^2 3d^6$
Cobalt ($_{27}Co$)	$[Ar]\ 4s^2 3d^7$
Nickel ($_{28}Ni$)	$[Ar]\ 4s^2 3d^8$
Copper ($_{29}Cu$)	$[Ar]\ 4s^1 3d^{10}$
Zinc ($_{30}Zn$)	$[Ar]\ 4s^2 3d^{10}$

Member of 4d series :-

	electronic Configuration.
Yttrium ($_{39}Y$)	$[Kr]\ 5s^2 4d^1$
Zirconium ($_{40}Zr$)	$[Kr]\ 5s^2 4d^2$
Niobium ($_{41}Nb$)	$[Kr]\ 5s^1 4d^4$
Molybdenum ($_{42}Mo$)	$[Kr]\ 5s^1 4d^5$
Technetium ($_{43}Tc$)	$[Kr]\ 5s^2 4d^5$
Ruthenium ($_{44}Ru$)	$[Kr]\ 5s^1 4d^7$
Rhodium ($_{45}Rh$)	$[Kr]\ 5s^1 4d^8$
Palladium ($_{46}Pd$)	$[Kr]\ 5s^0 4d^{10}$
Silver ($_{47}Ag$)	$[Kr]\ 5s^1 4d^{10}$
Cadmium ($_{48}Cd$)	$[Kr]\ 5s^2 4d^{10}$

In Case of atomic no. 41, 42, 43, 44, 45 and 47, 5s Suborbit has 1 electron.

- Transition Metal.

Transition metals are also called d-block element.

Since, in these transition metal last electron enter into second last d suborbit.

- d-block element are known as transition metal because their properties represents a change from most electropositive element (s-block element) and most electronegative (P-block) elements. Actually their properties are intermediate s-block and p-block elements.

They have outermost electronic configuration $(n-1)d^{1-10}ns^{1-2}$.

where $n = 4, 5, 6, 7$

all the elements of periodic table are divided into 4 series.

i) 3d-series or 1st transition series member ($_{21}Sc$ to $_{30}Zn$)

ii) 4d-series or 2nd transition series member (Y_{39} to $_{48}Cd$)

iii) 5d-series or 3rd transition series member ($_{57}La$, $_{72}Hf$ to $_{80}Hg$)

iv) 6d-series or 4th transition series member ($_{89}Ac$ — $_{104}Rf$ ——)

B.Sc Part III (H)

Chemistry of d-block element

Classification of elements on the basis of electronic configuration :-

On the basis of electronic configuration elements are classified into 4 block.

i) S block element (ns^1 or ns^2 where $n=1,2,3$
ii) P-block element (ns^2np^{1-6})
iii) d-block elements $[(n-1)d^{1-10}ns^2]$ or $[(n-1)d^{1-10}ns^{0-2}]$
iv) f-block elements $[(n-2)f^{1-14}(n-1)d^{0-10}ns^{1-2}$

d-block element :-

Those elements of periodic table whose last electron enter into d-suborbit is called d-block element.

or

The elements lying in the middle of periodic table between group-2 to group 13 are known as d-block element.
i.e. elements of group 3 to 13 are known as d-block element.

Modern definition of d-block element :-
Element or Transition Metal - elements which has incompletely filled d-suborbit in elements or most common ionic state are called