

## Topic :- THE D-AND F-BLOCK ELEMENTS

- 1 (c)  
After smelting in blast furnace, the slag is removed from slag hole of the furnace while a molten mass containing mostly  $\text{Cu}_2\text{S}$  + little  $\text{FeS}$  is called matte; it contains 80% metal.
- 2 (c)  
There is very small difference in energies of  $5f$ ,  $6d$  and  $7s$  orbitals of actinoids, therefore their electronic configuration cannot assigned with a degree of certainty
- 3 (d)  
In Mac-Arthur-Forrest method silver is extracted from the solution of sodium argentocyanide by using zinc.  
$$2\text{Na}[\text{Ag}(\text{CN})_2] + \text{Zn} \rightarrow \text{Na}_2[\text{Zn}(\text{CN})_4] + 2\text{Ag}\downarrow$$
- 5 (d)  
It is Mn and exhibits +7 oxidation state.
- 6 (d)  
The size of lanthanides are smaller than expected. This is associated with the filling with the filling up of  $4f$  orbitals which must be filled before the  $5d$  orbitals. The electrons in  $f$ -orbitals are not effective in screening other electrons from the nuclear charge
- 7 (b)  
 $\text{Ag}^+ + e \rightarrow \text{Ag}$ ; finely divided Ag is black in colour and thus  $\text{AgNO}_3$  causes black stain on skin. It is therefore, called lunar caustic.
- 8 (a)  
Due to  $3d^5$  configuration.
- 9 (c)  
 $\text{Gd} = [\text{Xe}]4f^75d^16s^2$ ,  
 $\text{Gd}^{3+} = [\text{Xe}]4f^7$  (half-filled)
- 10 (a)  
$$3\text{Hg} + 8\text{HNO}_3(\text{dil.}) \rightarrow 3\text{Hg}(\text{NO}_3)_2 + 2\text{NO} + 4\text{H}_2\text{O}$$

Soluble and washed away
- 11 (d)  
 $E^\circ_{\text{OP of Hg}} > E^\circ_{\text{OP of H}}$ . Thus, Hg is less reactive than  $\text{H}_2$ .
- 12 (a)  
Brass is an alloy of Cu + Zn (60-80% + 40-20% respectively).

13 **(a)**  
Maximum number of unpaired electrons are in Mn.

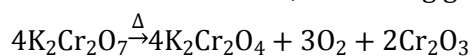
15 **(d)**  
It is a use of Ti alloys.

16 **(c)**

Ore	Chemical composition
Cuprite	$\text{Cu}_2\text{O}$
Chalcocite	$\text{Cu}_2\text{S}$
Chalcopyrite	$\text{CuFeS}_2$
Malachite	$\text{Cu}(\text{OH})_2 \cdot \text{CuCO}_3$

In these ores, chalcopyrite ( $\text{CuFeS}_2$ ) Contains both iron and copper.

17 **(c)**  
Potassium dichromate, on heating give oxygen and chromic oxide ( $\text{Cr}_2\text{O}_3$ )



18 **(b)**  
 $3\text{KCNS} + \text{FeCl}_3 \rightarrow 3\text{KCl} + \text{Fe}(\text{CNS})_3$   
Blood – red colour

19 **(a)**  
Fe, Co, Ni are called ferrous metals.

20 **(d)**  
 $\text{Ag}^+ + e \rightarrow \text{Ag}$ , i.e,  $\text{Ag}^+$  is reduced.

PE

<b>ANSWER-KEY</b>										
Q.	1	2	3	4	5	6	7	8	9	10
A.	C	C	D	A	D	D	B	A	C	A
Q.	11	12	13	14	15	16	17	18	19	20
A.	D	A	A	A	D	C	C	B	A	D

PE