1. The metal that is extracted from sea water is

(a) Ba (b) Mg

(c) Ca (d) Sr

2. Of the metals Be, Mg, Ca and Sr of group II A. In the periodic table the least ionic chloride would be formed by

(a) Be (b) Mg

(c) Ca (d) Sr

3. Bleaching powder is obtained by the interaction of chlorine and

(a) Conc. solution of $Ca(OH)_2$

(b) Dilute solution of $Ca(OH)_2$

(c) Dry calcium oxide

(d) Dry slaked lime

4. Which one of the following is a true peroxide

(a) SO_2 (b) BaO_2

(c) MnO_2 (d) NO_2

5. Which of the following alkaline earth metals shows some properties similar to aluminium

(a) Be (b) Ca

(c) Sr (d) Ba

6. Which of the following decreases on going gradually from Be to Ba (in periodic table)

(a) Basic character of hydroxides

(b) Solubility of sulphates in water

(c) Solubility of hydroxides in water

(d) Strength of elements as reducing agent

7. The oxide, which is best soluble in H_2O is

(a) $Ba(OH)_2$ (b) $Mg(OH)_2$

(c) $Sr(OH)_2$ (d) $Ca(OH)_2$

8. A mixture of lime paste is sand, water and

(a) Gypsum (b) Slacked lime

(c) Quick lime (d) Lime stone

9. Magnesium does not decompose the

(a) Steam (b) Hot water

(c) Cold Water (d) Semi hot water

10. Alkaline earth metals are denser than alkali metals because metallic bonding is

(a) Stronger (b) Weaker

(c) Not present (d) Volatile

11. A metal is burnt in air and the ash on moistening smells of NH_3. The metal is

(a) Na (b) Fe
(c) Mg (d) Al

12. Which one of the following is the strongest base
(a) $Be(OH)_2$ (b) $Mg(OH)_2$
(c) $Al(OH)_3$ (d) $Si(OH)_4$

13. Which is not soluble in water
(a) $CaCO_3$ (b) $BaCO_3$
(c) $SrCO_3$ (d) All of these

14. $MgCl_2.6H_2O$ when heated gives
(a) Magnesium oxychloride
(b) Magnesium dichloride
(c) Magnesium oxide
(d) Magnesium chloride

15. Which of the following statements is false
(a) $CaOCl_2$ gives OH^-, Cl^- and OCl^- in aqueous solution
(b) Diamond and graphite are allotrops of carbon
(c) Bleaching action of Cl_2 in moist condition is not permanent
(d) Calomel is Hg_2Cl_2

16. A metal M readily forms its sulphate MSO_4 which is water-soluble. It forms its oxide MO which becomes inert on heating. It forms its insoluble hydroxide $M(OH)_2$ which is soluble in $NaOH$ solution. Then M is
(a) Mg (b) Ba
(c) Ca (d) Be

17. which is used to reduced the acidity of soil
(a) Calcium hydroxide (b) Ammonium sulphate
(c) Ammonium nitrate (d) Ammonium chloride

18. Alkaline earth metals belong to the
(a) $s-$ block in periodic table
(b) $p-$ block in periodic table
(c) $d-$ block in periodic table
(d) $f-$ block in periodic table

19. The thermal stability of alkaline earth metal carbonates $MgCO_3, CaCO_3, BaCO_3$ and $SrCO_3$ decreases as
(a) $CaCO_3 > SrCO_3 > MgCO_3 > BaCO_3$
(b) $BaCO_3 > SrCO_3 > MgCO_3 > CaCO_3$
(c) $BaCO_3 > SrCO_3 > CaCO_3 > MgCO_3$
(d) $MgCO_3 > CaCO_3 > SrCO_3 > BaCO_3$

20. $Be(OH)_2$ is insoluble in water while $Ba(OH)_2$ is highly soluble due to

(a) Bond order (b) Lattice energy difference

(c) Common ion effect (d) Hard acid

21. Among the alkaline earth metals the element forming predominantly covalent compound is

(a) Barium (b) Strontium

(c) Calcium (d) Berylium

22. Least ionic character is found in

(a) Mg (b) Sr

(c) Ca (d) Ra

23. Which of the following is formed when calcium combines with oxygen

(a) Ca (b) CaO

(c) CaO_2 (d) Ca_2O_2

24. Slow acting nitrogenous fertilizer among the following is

(a) NH_2CONH_2 (b) NH_4NO_3

(c) $CaNCN$ (d) KNO_3

25. Plaster of paris is used

(a) In surgery and dentistry

(b) As a white wash

(c) As a constituent of tooth paste

(d) For the preparation of *RCC*

26. Iron pipes lying under acidic soil are often attached to blocks of magnesium for protection from rusting. Magnesium offers protection to iron against corrosion because it

(a) Prevents air from reaching the surface of iron

(b) is more readily converted into positive ions

(c) Is higher than iron

(d) Forms a corrosion-resistance alloy with iron

27. Among $K, Ca, Fe,$ and Zn, the element which can form more than one binary compound with chlorine is

(a) K (b) Ca

(c) Fe (d) Zn

28. $MgCl_2.6H_2O$. When heated gives

(a) Magnesium oxide

(b) Magnesium oxychloride

(c) Magnesium dichloride

(d) Magnesium chloride

29. Mg burns in CO to produce

(a) MgO_2 (b) $MgCO_3$

(c) $MgO + CO$ (d) $MgO + C$

30. Colemnite is

(a) $Ca[B_3O_4(OH)_2].2H_2O$

(b) $Ca_2B_6O_{11}.5H_2O$

(c) $Ca(OH)_2$

(d) $Na_2B_4O_7.2H_2O$

1. (b)

2. (a) Because of small atomic size and high I.E. Be forms covalent chloride.

3. (d) $\underset{\text{Slaked lime}}{Ca(OH)_2} + Cl_2 \rightarrow \underset{\text{Bleaching powder}}{CaOCl_2} + H_2O$

4. (b)

5. (a) *Be* due to diagonal relationship

6. (b) Because hydration energy decreases down the group.

7. (a) $Ba(OH)_2 > Sr(OH)_2 > Ca(OH)_2 > Mg(OH)_2$

Solubility decreasing order.

8. Your Self

9. (c)

10. (a) They are denser than alkali metals because they can be packed more tightly to their greater charge and smaller radii.

11. (c)

12. (b) $Mg(OH)_2$ *Mg* is most electropositive element amongst the given elements.

13. (d)

14. (c) $MgCl_2.6H_2O \xrightarrow{\text{heat}} MgO + 5H_2O + 2HCl$

15. (c) Bleaching action of Cl_2 in moist condition is permanent.

$Cl_2 + H_2O \rightarrow HCl + HClO$

$HClO \rightarrow HCl + O$

$Cl_2 + H_2O \rightarrow 2HCl + O$

Coloured matter + nascent oxygen $\rightarrow$ colourless matter

16. (d) The solubility of hydroxides of alkaline earth metals in water increases on moving down the group.

17. (a)

18. (a) It is a *s*-block elements.

19. (c) Thermal stability increasing from top to bottom.

20. (b) On moving down the group; Lattice energy decreases with increase in size of cation.

21. (d) Berylium because of small atomic size and high ionization energy.

22. (a) $\underset{\text{Ionic nature increases}}{Mg < Ca < Sr < Ba < Ra \longrightarrow}$

as we go down the group ionic nature increases because I.E. decreases.

23. (b) $Ca + \frac{1}{2}O_2 \rightarrow CaO$.

24. (c) Calcium cyanamide is the slow acting nitrogenous fertilizer as it decompose very slowly.

$$CaNCN + 2H_2O \rightarrow \underset{\text{Urea}}{NH_2CONH_2} + CaCO_3$$

$$NH_2CONH_2 + H_2O \rightarrow CO_2 + 2NH_3$$

$$NH_3 \xrightarrow[\text{bacteria}]{\text{Nitrifying}} \text{Soluble nitrates} \rightarrow \text{Plants}$$

25. (a) Plaster of paris $[(CaSO_4)_2H_2O]$ is used in surgery for setting of bones, dentistry and manufacturing of statues. It is prepared as follows,

$$2CaSO_4.2H_2O \xrightarrow{125\,^\circ C} \underset{\text{Plaster of paris}}{(CaSO_4)_2.H_2O} + 3H_2O$$

26. (b) Due to electropositive and reactive in nature, magnesium is readily converted into positive ions on contact with iron pipes and hence, iron pipes remains as it is.

27. (c) A binary compound is one made of two different elements. These can be one of each element such as *CuCl* or *FeO*. These can also be several of each element such as Fe_2O_3 or $SnBr_4$. Metal which have variable oxidation number can form more than one type of binary compound like *Fe* shows the oxidation state +2 and +3. Hence it forms two type of binary compound *e.g.*, $FeCl_2, FeCl_3$.

28. (c) We know that $MgCl_2.6H_2O \xrightarrow{Heat} MgCl_2 + 6H_2O$

Thus in this reaction magnesium dichloride is produced.

29. (d) Magnesium burns in *CO* to produce

$$Mg + CO \rightarrow MgO + C$$

30. (b) Colemnite is a mineral of boron having composition as $Ca_2B_6O_{11}.5H_2O$.