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CLASS 12

 **CHEMISTRY** 

*Created One Mark  
Questions*

**2024-2025**

**LESSON -1**

1. Which metal is used for extraction of Au and Ag and also for galvanization of iron object?  
a) Mg b) Zn c) Cr d) Co
2. Which of the following is not a mineral of aluminium?  
a) Bauxite b) Cryolite c) China clay d) Malachite
3. Name the process by which elements such as germanium, silicon and gallium are refined.  
a) Vapour phase method b) Electrolytic refining c) Zone refining d) Van-Arkel method.
4. In the extraction of copper from its sulphide ore, the metal is finally obtained by the reduction of cuprous oxide with  
a) Iron sulphide (FeS) b) Carbon monoxide (CO) c) Copper (I) sulphide (Cu<sub>2</sub>S) d) Sulphur dioxide (SO<sub>2</sub>)
5. Concentration of copper glance is done by  
a) leaching b) magnetic separation c) froth flotation d) hydraulic washing
6. Zone refining is based on  
a) fractional distillation b) simple distillation c) sublimation d) fractional crystallization
7. The process of heating of copper pyrites to remove sulphur is called  
a) froth flotation b) roasting c) calcination d) smelting
8. Malachite has \_\_\_\_\_ composition.  
a) 2CuCO<sub>3</sub>.Cu(OH)<sub>2</sub> b) CuCO<sub>3</sub>.Cu(OH)<sub>2</sub> c) Cu<sub>2</sub>O d) Cu<sub>2</sub>S
9. Zinc blende is \_\_\_\_\_  
a) ZnS b) PbS c) Ag<sub>2</sub>S d) Cu<sub>2</sub>S
10. In acid leaching process, the insoluble sulphide is converted into soluble sulphate and elemental \_\_\_\_\_  
a) Carbon b) Lead c) Sulphur d) Zinc
11. Gibb's free energy is given by \_\_\_\_\_  
a)  $\Delta G_o = -nFE_o$  b)  $\Delta G_o = nF$  c)  $\Delta G_o = nFE_o$  d)  $\Delta E_o = -nFG_o$
12. In the metallurgy of iron, limestone is added to coke which acts as a \_\_\_\_\_  
a) reducing agent b) oxidizing agent c) slag d) Flux
13. Froth flotation process is suitable for concentrating \_\_\_\_\_ ore.  
a) Oxide b) Carbonate c) Sulphide d) Halide
14. Metal oxide is converted into metal by  
a) Calcination b) Roasting c) Smelting d) Bessemerisation
15. In Hall-Herold process, \_\_\_\_\_ act as an anode.  
a) Carbon blocks b) Hydrogen c) Copper rods d) Zinc rods
16. In froth floatation sodium ethyl Xanthate is used as a  
a) Collector b) depressing agent c) frothing agent d) Flux
17. Which method is based on the solubility of the ore in a suitable solvent  
a) Gravity separation b) Hydraulic wash c) Leaching d) Magnetic separation
18. Tin stone, Chromite and Pyrolusite are concentrated by \_\_\_\_\_ process.  
a) Gravity separation b) Hydraulic wash c) Froth flotation d) Magnetic separation
19. The process of ore into metal oxide with absence of air is called  
a) Oxidation b) Cementation c) Galvanization d) Calcination
20. Metals having low melting points such as tin, lead, mercury and bismuth are refined by  
a) Distillation b) Liquation c) Electrolytic d) Zone refining
21. Which one is used in the manufacture of many products such as paints, rubber, cosmetics.  
a) Zinc carbonate b) Zinc oxide c) Zinc metal d) Zinc sulphide
22. Which one is used for cutting tools and crushing machines.  
a) Nickel steel b) Chrome steel c) Chrome vanadium steel d) Nichrome
23. Ellingham diagram helps to select  
a) suitable reducing agent b) appropriate temperature c) both (a) and (b) d) oxidizing agent
24. The complex formed when NaCN is added to galena in which ZnS is the impurity  
a)  $2Na[Zn(CN)_4]$  b)  $Na_2[Zn(CN)_4]$  c)  $2Zn[Na(CN)_2]$  d)  $Na_4[Zn(CN)_4]$

25. Depressing agents used to separate ZnS from PbS is  
a) NaCN b) NaCl c) NaNO<sub>3</sub> d) NaNO<sub>2</sub>
26. Which type of leaching process convert insoluble sulphide ore into soluble sulphates?  
a) cyanide leaching b) alkali leaching c) acid leaching d) hand picking

**LESSON-2**

1. More common oxidation state for halogens is .....  
(a) +1 (b) +2 (c) -1 (d) -2
2. Electronic configuration of noble gases is .....  
(a) ns<sup>2</sup> (b) ns<sup>2</sup> np<sup>5</sup> (c) ns<sup>1</sup> np<sup>6</sup> (d) ns<sup>2</sup> np<sup>6</sup>
3. Noble gases are chemically inert. This is due to ..... ( )  
a) unstable electronic configuration (b) stable electronic configuration (c) only filled p-orbital (d) only filled 5-orbital
4. Noble gases are chemically inert. This is due to .....  
(a) unstable electronic configuration (b) stable electronic configuration (c) only filled p-orbital (d) only filled 5-orbital 10
5. Which one of the following is the strongest oxidising agent?  
(a) Fluorine (b) Chlorine (c) Bromine (d) Iodine
6. Some elements exist in more than one crystalline or molecular forms in the same physical state is called .....(a) isomerism (b) allotropism (c) isomorphism (d) isoelectronics
7. How many allotropes possible for boron?  
(a) 1 (b) 4 (c) 6 (d) 7
8. Important ore of boron is (a) bauxite (b) borosilicate(c) borax (d) P-tetragonal boron
9. Borontrifluoride reacts with sodium hydride at 450 K gives .....  
(a) diborane (b) tetraborane (c) pentaborane (d) decaborane
10. Boron reacts with fused sodium hydroxide to forms .....  
(a) Borax (b) Boric acid (c) Sodium borate (d) Sodium tetraborate
11. Which isotope is used as moderator in nuclear reactors?  
(a) <sup>10</sup>B<sub>5</sub> (b) <sup>12</sup>C<sub>6</sub> (c) <sup>4</sup>He<sub>2</sub> (d) <sup>40</sup>Ca<sub>2</sub>

12. Compounds used as an eye lotion .....  
(a) H<sub>3</sub>BO<sub>3</sub> (b) HBO<sub>2</sub> (c) H<sub>2</sub>B<sub>4</sub>O<sub>7</sub> (d) B<sub>2</sub>O<sub>3</sub>
13. Which one of the following is called as inorganic benzene?  
(a) B<sub>2</sub>H<sub>6</sub> (b) BN (c) H<sub>2</sub>B<sub>4</sub>O<sub>7</sub> (d) B<sub>3</sub>N<sub>3</sub>H<sub>6</sub>
14. Diborane reacts with excess ammonia at high temperature to give .....  
(a) Boron nitride (b) Boron oxide (c) Borazole (d) Diborane diammonate
15. Consider the following statements.  
(i) Diborane contains two centre-two electron bond. (ii) In diborane, the boron has sp<sup>3</sup> hybridised. (iii) Diborane has two terminal B – H bonds and four B – H – B bonds. Which of the above statement(s) is/are correct.  
(a) (i) and (iii) (b) (ii) and (iii) (c) (i) only (d) (i) and (ii)
16. The structure of graphite is .....  
(a) planar (b) hexagonal (c) octahedral (d) bucky balls
17. CO and N<sub>2</sub> mixture is ..... (a) natural gas (b) producer gas (c) water gas (d) LPG 11
18. Syn gas is .....  
(a) CO + N<sub>2</sub> (b) CO + H<sub>2</sub> (c) CO<sub>2</sub> + H<sub>2</sub> (d) CO<sub>2</sub> + N<sub>2</sub>
19. Critical temperature of CO<sub>2</sub> is .....  
(a) -31°C (b) -13°C (c) 31°C (d) 13°C
20. Ortho silicates are also called as .....  
(a) Ino silicates (b) Soro silicates (c) Neso silicates (d) Cyclic silicates
21. Example of Ring silicate is .....  
(a) Olivine (b) Beryl (c) Spodumene (d) Asbestos
22. Compound used to remove the permanent hardness of water is .....  
(a) Zeolite (b) Feldspar (c) Talc (d) Mica
23. Pick out the three dimensional silicates?  
(a) Talc (b) Mica (c) Quartz (d) Asbestos

**LESSON-3**

1. Nitrogen gas in atmosphere is separated industrially from liquid air by .....

- (a) simple distillation (b) Fractional distillation (c) Sublimation (d) Distillation under reduced pressure
2. Which one of the following is used in cryosurgery?  
(a) Liq N<sub>2</sub> (b) Liq NH<sub>3</sub> (c) Liq Na (d) Liq H<sub>2</sub>
3. The dielectric constant of ammonia is (K) .....  
(a) 10-30 (b) 10-14 (c) 1030 (d) 1014
4. H - N - H bond angle in NH<sub>3</sub> is .....  
(a) 109° 28' (b) 107° 28' (c) 104° (d) 107°
5. Shape of ammonia is .....  
(a) Planar (b) Square planar (c) Pyramidal (d) Square pyramidal
6. Nitric acid prepared in large scales using .....  
(a) Ostwald's process (b) Haber's process (c) Contact process (d) Deacon's process
7. Benzene undergoes nitration reaction to form nitrobenzene in this reaction takes place due to the formation of .....  
(a) Hydronium ion (b) Hydride ion (c) Nitronium ion (d) Nitrasonium ion
8. Compound used in photography is .....  
(a) AgNO<sub>3</sub> (b) AgBr (c) AgCl (d) AgI
9. Sodium nitrate  
(a) Photography (b) Firearms (c) Royal water (d) Cryosurgery
10. White (Yellow) phosphorous glows in the dark due to oxidation which is called .....  
(a) phosphorescence (b) phosphorus (c) Fluorescence (d) Liminoscence
11. Yellow phosphorous reacts with alkali on boiling in an inert atmosphere liberates .....  
(a) Phosphorous acid (b) Phosphoric acid (c) Phosphine (d) Pyrophosphoric acid
12. Hybridisation of P in phosphine is .....  
(a) sp<sup>3</sup> d (b) sp<sup>3</sup> d<sup>2</sup> (c) sp<sup>3</sup> d<sup>3</sup> (d) sp<sup>3</sup>
13. Compounds used in Holme's signal are .....  
(a) Phosphine + Acetylene (b) H<sub>3</sub>PO<sub>3</sub>+H<sub>3</sub>PO<sub>3</sub> (c) Calcium carbide + calcium phosphide (d) Calcium carbonate + calcium phosphate
14. Shape of ozone .....  
(a) V-shape (b) Linear shape (c) bent shape (d) spherical shape 14
15. Sulphur di oxide, how many times heavier than air?  
(a) 2 times (b) 2.5 times (c) 2.2 times (d) 2.3 times
16. Sulphuric acid can be manufactured by .....  
(a) Ostwald's process (b) Lead chamber process (c) Deacon's process (d) Haber's process
17. Sulphuric acid is manufactured by contact process, catalyst used in contact process is .....  
(a) V<sub>2</sub>O<sub>5</sub> (b) TiCl<sub>4</sub> (c) Fe (d) Mo
18. Deacon's process is used to manufacture .....  
(a) Cl<sub>2</sub> (b) F<sub>2</sub> (c) Br (d) I<sub>2</sub>
19. Catalyst used in Deacon's process is .....  
(a) CuCl<sub>2</sub> (b) Cu<sub>2</sub>Cl<sub>2</sub> (c) CuBr (d) Cu<sub>2</sub>Br<sub>2</sub>
20. Passing chlorine gas through dry slaked lime to produce .....  
(a) CaOCl (b) CaOCl<sub>2</sub> (c) CaO (d) CaCl<sub>2</sub>
21. Which one of the following is a weak acid?  
(a) HF (b) HCl (c) HBr (d) HI
22. Reagent not stored in glass bottles?  
(a) HCl (b) HBr (c) HF (d) HI
23. The correct order of the acidity of hydrohalic acids?  
(a) HF > HCl > HBr > HI (b) HCl > HF > HBr > HI (c) HBr > HCl > HF > HI (d) HI > HBr > HCl > HF
24. Shape of ClF<sub>3</sub> is .....  
(a) Linear (b) T-shape (c) Pyrimidal (d) Square planar
25. Which one of the following is more acidic?  
(a) HOCl (b) HClO<sub>2</sub> (c) HClO<sub>3</sub> (d) HClO<sub>4</sub>
26. Shape of XeF<sub>6</sub> is .....  
(a) Octahedron (b) Distorted octahedron (c) Pyramidal (d) Tetrahedron
27. Which one of the following can penetrate through dense fog?  
(a) He (b) Ne (c) Kr (d) Rn

28. Aquaregia

- a) 3 parts of con.HCl, one part of con.HNO<sub>3</sub> b) 1 part of con.HCl, 3 parts of con.HNO<sub>3</sub> c) 3 parts of con.HCl, one part of con.H<sub>2</sub>SO<sub>4</sub> d) 1 part of con.H<sub>2</sub>SO<sub>4</sub>, one part of con.HNO<sub>3</sub>

29. Shape of AX<sub>7</sub> inter halogen compound

- a) Square pyramidal b) pentagonal bipyramidal c) T shaped d) Linear

30. Structure of XeOF<sub>4</sub>

- a) Square pyramidal b) pentagonal bipyramidal c) T shaped d) Linear

31. Hybridisation in XeF<sub>4</sub>

- (a) sp<sup>3</sup> d (b) sp<sup>3</sup> d<sup>2</sup> (c) sp<sup>3</sup> d<sup>3</sup> (d) sp<sup>3</sup>

#### LESSON-4

1. Identify the transition metal present in Hemoglobin .....

- (a) Cobalt (b) Iron (c) Manganese (d) Copper

2. Which of the following transition metal is present in Vitamin B<sub>12</sub>?

- (a) Cobalt (b) Platinum (c) Copper (d) Iron

3. The correct electronic configuration of Cr is .....

- (a) [Ar] 3d<sup>4</sup> 4s<sup>2</sup> (b) [Ar] 3d<sup>5</sup> (c) [Ar] 3d<sup>5</sup> 4s<sup>1</sup> (d) [Ar] 3d<sup>6</sup>

4. Which of the following is the correct electronic configuration of copper?

- (a) [Ar] 3d<sup>5</sup> 4s<sup>1</sup> (b) [Ar] 3d<sup>10</sup> 4s<sup>1</sup> (c) [Ar] 3d<sup>9</sup> 4s<sup>2</sup> (d) [Ar] 3d<sup>8</sup> 4s<sup>2</sup> 4p<sup>1</sup>

5. Which one of the following is the general electronic configuration of transition elements?

- (a) [Noble gas] ns<sup>2</sup> np<sup>6</sup> (b) [Noble gas] (n - 2) f<sup>1-14</sup>(n-1)d<sup>1-10</sup> ns<sup>2</sup> (c) [Noble gas] (n - 1) d<sup>1-10</sup> (n-1)f<sup>1-14</sup> ns<sup>2</sup> (d) [Noble gas] (n - 1) d<sup>1-10</sup> ns<sup>2</sup>

6. Which of the following d-block elements has the highest electrical conductivity at room temperature?

- (a) Copper (b) Silver (c) Aluminium (d) Tungsten

7. Which one of the following is diamagnetic in nature?

- (a) Ti<sup>3+</sup> (b) Cu<sup>2+</sup> (c) Zn<sup>2+</sup> (d) V<sup>3+</sup>

8. Which of the following pair has maximum number of unpaired electrons?

- (a) Mn<sup>2+</sup>, Fe<sup>3+</sup> (b) CO<sup>3+</sup>, Fe<sup>2+</sup> (c) Cr<sup>3+</sup>, Mn<sup>4+</sup> (d) Ti<sup>2+</sup>, V<sup>3+</sup>

9. Which one of the following is Zeigler - Natta catalyst?

- (a) CO<sub>2</sub>(CO)<sub>8</sub> (b) Rh/Ir complex (c) TiCl<sub>4</sub> + Al(C<sub>2</sub>H<sub>5</sub>)<sub>3</sub> (d) Fe / Mo

10. Which one of the following is used as a catalyst in the polymerisation of propylene?

- (a) V<sub>2</sub>O<sub>5</sub> (b) Pt (c) TiCl<sub>4</sub> + Al(C<sub>2</sub>H<sub>5</sub>)<sub>3</sub> (d) Fe / Mo

11. Which one of the following oxide is amphoteric in nature?

- (a) CrO (b) Cr<sub>2</sub>O<sub>3</sub> (c) Mn<sub>2</sub>O<sub>7</sub> (d) MnO

12. The oxidation state of Chromium in CrO<sub>4</sub><sup>-2</sup> and in Cr<sub>2</sub>O<sub>7</sub><sup>-2</sup> are .....

- (a) +3, +6 (b) +7, +4 (c) +6, +6 (d) +4, +6

13. Which one of the following is the formula of chromyl chloride?

- (a) CrOCl<sub>2</sub> (b) CrCl<sub>3</sub> (c) CrO<sub>2</sub> Cl<sub>2</sub> (d) CrCl<sub>18</sub>

14. Which one of the following geometry is possessed by permanganate ion?

- (a) Pyramidal (b) Tetrahedral (c) Octahedral (d) linear

15. Which one of the following is known as Baeyer's reagent?

- (a) Cold dilute alkaline KMnO<sub>4</sub> (b) Chromyl Chloride (c) Acidified potassium dichromate (d) Acidified potassium manganite

16. Baeyer's reagent is used to detect unsaturation in an organic compound.

- (a) Chloride ion (b) unsaturated organic compound (c) Sulphate ion (d) Chromate ion

17. Which one of the following is the main cause of lanthanoid contraction?

- (a) Poor shielding effect of 5f sub-shell (b) More shielding effect of 4f sub-shell (c) Poor shielding effect of 4f sub-shell (d) More shielding effect of 5f sub-shell

18. Which of the following pair has more or less same atomic radius due to lanthanide contraction? (a) Ti and V (b) Fm and Md (c) No and Lr (d) Zr and Hf

19. Which one of the following is more basic in nature?

- (a) La(OH)<sub>3</sub> (b) Ce(OH)<sub>3</sub> (c) Gd(OH)<sub>3</sub> (d) Lu(OH)<sub>3</sub>

20. Assertion (A) - In transition metal series, the ionization enthalpy increases.

Reason (R) - This is due to increase in nuclear charge corresponding to the filling of d electrons. (a) Both (A) and (R) are correct and (R) explains (A). (b) Both (A) and (R) are correct but (R) is not the correct explanation of (A). (c) (A) is

correct but (R) is wrong. (d) (A) is wrong but (R) is correct.

21. Which one of the following elements show high negative electrode potential?

(a) Copper (b) Manganese (c) Cobalt (d) Zinc

22. Which one of the following transition element has maximum oxidation states?

(a) Manganese (b) Copper (c) Scandium (d) Titanium

### LESSON-5

1. What are primary and secondary valency of cobalt in  $\text{CoCl}_3 \cdot 6\text{NH}_3$ ?

(a) 3, 3 (b) 6, 3 (c) 3, 6 (d) 6, 6

2. Consider the following statements.

(i) The outer sphere in coordination compound is called ionisation sphere. (ii)

The primary valences are non directional while secondary valences are directional. (iii) The primary valences of a metal ion is negative and it is satisfied by positive ions. Which of the above statements is/are not correct?

(a) (i) and (ii) (b) (ii) and (iii) (c) (iii) only (d) (ii) only

3. Which of the following is called Lewis acid in  $[\text{Ni}(\text{CO})_4]$ ?

(a)  $\text{Ni}^{2+}$  (b) CO (c)  $\text{Ni}^{4+}$  (d) CO

4. The oxidation state of Fe in  $[\text{Fe}(\text{CN})_6]^{4-}$  is .....

(a) II (b) III (c) VI (d) IV

5. What is the coordination number of Pt in  $[\text{Pt}(\text{NO}_2)(\text{H}_2\text{O})(\text{NH}_3)_2]\text{Br}$ ?

(a) 3 (b) 4 (c) 2 (d) 5

6. Which one of the following is a homoleptic complex?

(a)  $[\text{Co}(\text{NH}_3)_3(\text{Cl}_3)]$  (b)  $[\text{Pt}(\text{NH}_3)_2\text{Cl}_2]$  (c)  $[\text{Pt}(\text{NO}_2)(\text{H}_2\text{O})(\text{NH}_3)_2]\text{Br}$  (d)  $[\text{Co}(\text{NH}_3)_6]\text{Cl}_3$

7. Which one of the following is called as Zeise's salt?

(a)  $[\text{Pt}(\text{NH}_3)_4]$   $[\text{PtCl}_4]$  (b)  $\text{K}[\text{PtCl}_3(\text{C}_2\text{H}_4)]$  (c)  $\text{K}_4[\text{Fe}(\text{CN})_6]$  (d)  $[\text{Fe}(\text{CO})_5]$

8.  $[\text{Pt}(\text{NH}_3)_4]$   $[\text{PtCl}_4]$  is called as .....

(a) Zeigler Natta Catalyst (b) Zeises' salt (c) Magnus's green salt (d) Mohr's salt

9. The IUPAC name of  $\text{K}_4[\text{Fe}(\text{CN})_6]$  is .....

(a) Potassium hexacyanido Ferrate (III) (b) Potassium hexacyanidoferrate (II) (c) Potassium ferrocyanide (d) Potassium ferricyanide

10. The IUPAC name of  $[\text{Co}(\text{NH}_3)_4\text{Cl}_2]\text{Cl}$  is .....

(a) Tetrammine dichlorido cobalt (III) chloride (b) Dichlorido tetrammine cobalt (III) chloride (c) Tetrammine cobalt (III) trichloride (d) Tetrammine dichlorido cobaltate (III)

11. The formula of Hexafluorido ferrate (II) ion is .....

(a)  $[\text{FeF}_6]^{4-}$  (b)  $[\text{FeF}_6]^{3-}$  (c)  $[\text{FeF}_6]^{2-}$  (d)  $[\text{FeF}_6]^{3+}$

12.  $[\text{Cr}(\text{NH}_3)_4\text{ClBr}]\text{NO}$ , and  $[\text{Cr}(\text{NH}_3)_4\text{ClNO}_2]\text{Br}$  are examples of .....

(a) Linkage isomerism (b) Ionisation isomerism (c) Coordination isomerism (d) Hydrate isomerism

13. Square planar complexes have type of hybridisation .....

(a)  $\text{sp}^3$  (b)  $\text{dsp}^2$  (c)  $\text{sp}^3\text{d}$  (d)  $\text{sp}^3\text{d}^2$

14. In octahedral geometry, the type of hybridisation involved is .....

(a)  $\text{sp}^3\text{d}^2$  (b)  $\text{d}^2\text{sp}^3$  (c)  $\text{dsp}^3$  (d) a or b

15. The geometry of  $[\text{Fe}(\text{CN})_6]^{3-}$  is .....

(a) Tetrahedral (b) Octahedral (c) Square planar (d) Trigonal bipyramidal

16. Which is used for the separation of lanthanides, in softening of hard water and also in removing lead poisoning?

(a)  $[\text{Ni}(\text{CO})_4]$  (b) EDTA (c)  $[\text{Ni}(\text{DMG})_2]$  (d)  $\text{TiCl}_4 + \text{Al}(\text{C}_2\text{H}_5)_3$

17. Which complex is used as an antitumor drug in cancer treatment?

(a) Ca - EDTA chelate (b) EDTA (c)  $\text{TiCl}_4 + \text{Al}(\text{C}_2\text{H}_5)_3$  (d) Cis - Platin

18. The IUPAC name of Zeise's salt is .....

(a) Tetramminecopper (II) sulphate (b) Ferrous Ammonium sulphate (c) Tetracyanocopper (II) Sulphate (d) Potassiumtrichloro (ethene) platinate (II)

19. The CFSE is the highest for .....

(a)  $[\text{CoF}_4]^{2-}$  (b)  $[\text{Co}(\text{NCS})_4]^{2-}$  (c)  $[\text{Co}(\text{NH}_3)]^{3+}$  (d)  $[\text{CoCl}_4]^{2-}$

20. The hybridization involved in the complex  $[\text{Ni}(\text{CN})_4]^{2-}$  is .....

(a)  $\text{sp}^3$  (b)  $\text{d}^2\text{sp}^3$  (c)  $\text{dsp}^2$  (d)  $\text{sp}^3\text{d}^2$

21. Assertion (A) -  $[\text{Co}(\text{NH}_3)_4\text{Br}_2]\text{Cl}$  and  $[\text{Co}(\text{NH}_3)_4\text{ClBr}]\text{Br}$  are examples of ionisation isomers. Reason (R) - The exchange of counter ions with one or more ligands in the coordination entity will result in ionisation isomers.



- (a) Both A and R are correct and R is not the correct explanation of A. (b) Both A and R are correct but R is the correct explanation of A. (c) A and R are wrong. (d) A is wrong but R is correct.

### LESSON-6

- Which one of the following is an amorphous solid?  
(a) Glass (b) SiO<sub>2</sub> (c) NaCl (d) Na
- Which one of the following is an example for molecular crystals?  
(a) Diamond (b) Silica (c) Glass (d) Naphthalene
- Which one of the following is a covalent crystal?  
(a) Glass (b) Diamond (c) Anthracene (d) Glucose
- In an ionic crystal, both cations and anions are bound together by .....  
(a) Strong electrostatic attractive forces (b) Weak electrostatic attractive forces (c) Vanderwaals forces of attraction (d) Weak cohesive forces
- In non polar molecular solids, molecules are held together by .....  
(a) London forces (b) weak vanderwaals forces (c) Strong electrostatic forces (d) strong cohesive forces
- Solid NH<sub>3</sub> solid CO<sub>2</sub> are examples of .....  
(a) Covalent solid (b) polar molecular solids (c) molecular solids (d) ionic solids
- Each atom in the corner of the cubic unit cell is shared by how many unit cells?  
(a) 8 (b) 6 (c) 1 (d) 12
- The number of atoms belongs to fcc unit cell is .....  
(a) 2 (b) 4 (c) 6 (d) 12
- The atoms the face centre is being shared by .....  
(a) 4 (b) 8 (c) 2 (d) 6
- Which is the packing fraction in simple cubic unit cell?  
(a) 52.31% (b) 100% (c) 68% (d) 75%
- The packing fraction in bcc arrangement is .....  
(a) 52.3 1% (b) 68% (c) 100% (d) 80%
- Which is the coordination number in both hcp and ccp arrangements?  
(a) 12 (b) 6 (c) 4 (d) 8 27

- The coordination number of zinc sulphide is .....  
(a) 3 (b) 4 (c) 6 (d) 8
- Which one of the following is the coordination number of NaCl?  
(a) 3 (b) 4 (c) 6 (d) 8
- Which one of the following is an example for Frenkel defect?  
(a) NaCl (b) AgCl (c) AgBr (d) AgNO<sub>3</sub>
- Which one of the following is the metal deficiency defect?  
(a) FeO (b) ZnO (c) KCl (d) NaCl
- Which one of the following shows non- stoichiometric defect?  
(a) FeO (b) AgBr (c) ZnO (d) Both a and c
- Which one of the following is the packing efficiency in fcc unit cell?  
(a) 74% (b) 52.6 1% (c) 100% (d) 68%
- The coordination number of CsCl is .....  
(a) 3 (b) 4 (c) 6 (d) 8
- Which one of the following formula is used to calculate the density of the unit cell ?  
(a)  $\rho = nMa^3 / NA$  (b)  $\rho = a^3 NA / nM$  (c)  $\rho = NAa^3 / NM$  (d)  $\rho = a^3 NAn$
- Which one of the following is known as Bragg's equation?  
(a)  $d = 2\sin\theta n\lambda$  (b)  $d = n\lambda 2\sin\theta$  (c)  $d = d\sin\theta$  (d)  $d = 2\sin\theta n\lambda$
- Naphthalene is an example of .....  
(a) ionic solid (b) covalent solid (c) non polar molecular solid (d) polar molecular solid

### LESSON-7

- Which one of the following is the unit of rate of reaction?  
(a) s<sup>-1</sup> (b) mol s<sup>-1</sup> (c) mol L<sup>-1</sup> s<sup>-1</sup> (d) mol L s
- Which of the following is the order of decomposition of hydrogen peroxide catalysed by I<sup>-</sup>?  
(a) First order (b) Second order (c) Zero order (d) Third order
- Which one of the following is the unit of rate constant for a first order reaction?  
(a) mol<sup>-1</sup> L s<sup>-1</sup> (b) mol L<sup>-1</sup> s<sup>-1</sup> (c) s<sup>-1</sup> (d) mol L S

4. What is the order of isomerisation of cyclopropane to propene?

(a) 1.5 (b) 3/2 (c) 5/2 (d) 1

5. Which one of the following is called pseudo first order reaction?

(a) Decomposition of acetaldehyde (b) Acid hydrolysis of an ester (c)

Isomerisation of cyclopropane to propene (d) Decomposition of hydrogen peroxide

6. The half life period of first order reaction is 10 seconds. What is the time required for 99.9% completion of that reaction?

(a) 20 seconds (b) 1000 seconds (c) 100 seconds (d) 999 seconds

7. Which one of the following does not affect the rate of the reaction?

(a) Nature of the reactant (b) Concentration of the reactants (c) Surface area and temperature (d) pressure

8. What is the order of radioactive decay?

(a) first order (b) zero order (c) second order (d) third order

9.  $t_{1/2}$  of the reaction increases with increase in initial concentration of the reaction means the order of the reaction will be .....

(a) first order (b) zero order (c) second order (d) third order

10. Identify the reaction order if the unit of rate constant is  $s^{-1}$  .....

(a) zero order reaction (b) second order reaction (c) first order reaction (d) third order reaction

11. What is unit of zero order reaction?

(a)  $s^{-1}$  (b)  $\text{mol}^{-1} \text{L}^{-1} \text{s}^{-1}$  (c)  $\text{mol L}^{-1} \text{s}^{-1}$  (d)  $\text{mol L s}^{-1}$

12. Polymerisation reactions follows ..... order kinetics.

(a) fractional (b) first (c) zero (d) Pseudo first

13. Activation energy of a chemical reaction can be determined by .....

(a) changing concentration of the reactants (b) Evaluating rate constants at standard temperature (c) Evaluating rate constants at two different temperature (d) Evaluating velocities of reaction at two different temperature

14. A large increase in the rate of a reaction for a rise in temperature is due to .....

(a) the decrease in the number of collisions (b) increase in the number of activated molecules (c) the shortening of mean free path (d) the lowering of activation energy

15. The minimum energy of a molecule would possess in order to enter into a fruitful collision is known as

(a) Reaction energy (b) collision energy (c) Activation energy (d) Threshold energy

16. Assertion (A): Powdered calcium carbonate reacts much faster with dilute HCL than with the same mass of  $\text{CaCO}_3$  as marble. Reason (R): For a given mass of a reactant, when the particle size decreases, surface area increases. Increase in surface area of the reactant leads to more collisions per litre per second and hence the rate of the reaction also increases.

(a) Both A and R are correct and R is the correct explanation of A. (b) Both A and R are correct but R is not correct explanation of A (c) A is correct but R is wrong (d) A is wrong but R is correct

17. Assertion (A): Order of the reaction can be zero or fractional Reason (R): We cannot determine order from balanced chemical equation

(a) Both A and R are correct but R is not correct explanation of A. (b) Both A and R are correct and R is the correct explanation of A (c) A is correct but R is wrong (d) A is wrong but R is correct

18. Assertion (A): If the activation energy of a reaction is zero, temperature will have no effect on the rate constant Reason (R): Lower the activation energy, faster is the reaction.

### Lesson 8

1. Which of the following is present in an antacid tablet?

(a) NaOH (b)  $\text{Mg}(\text{OH})_2$  (c)  $\text{Al}(\text{OH})_3$  (d) either (b) or (c)

2. Which of the following can act as an acid as well as base by Lowry - Bronsted theory?

(a)  $\text{H}_2\text{O}$  (b)  $\text{NH}_3$  (c)  $\text{NH}_4\text{OH}$  (d)  $\text{Ca}(\text{OH})_2$

3. In the reaction  $\text{HCl} + \text{H}_2\text{O} \rightleftharpoons \text{H}_3\text{O}^+ + \text{Cl}^-$  which one of the acid-base pair?



(a)  $\text{HCl} + \text{H}_3\text{O}^+$  (b)  $\text{HCl} + \text{Cl}^-$  (c)  $\text{H}_3\text{O}^+ + \text{Cl}^-$  (d)  $\text{H}_2\text{O} + \text{Cl}^-$

4. In  $[\text{Cr}(\text{H}_2\text{O})_6]^{3+}$  which one of the following acts as Lewis acid?

(a) Cr (b)  $\text{Cr}^{3+}$  (c)  $(\text{H}_2\text{O})_6$  (d)  $\text{Cr}^{3-}$

5. The value of ionic product of water at  $25^\circ\text{C}$  is .....

(a)  $1 \times 10^{-7}$  (b)  $1 \times 10^7$  (c)  $1 \times 10^{-14}$  (d)  $1 \times 10^{14}$

6. The pH of 0.001 M HCl solution is .....

(a) 3 (b) 2 (c) 1 (d) 11 [www.nammakalvi.in](http://www.nammakalvi.in) 6

7. Which of the following is not a buffer solution?

(a)  $\text{CH}_3\text{COOH} + \text{CH}_3\text{COONa}$  (b)  $\text{NH}_4\text{OH} + \text{NH}_4\text{Cl}$  (c)  $\text{H}_2\text{CO}_3 + \text{NaHCO}_3$  (d)  $\text{NaOH} + \text{NaCl}$

8. The conjugate base of  $\text{H}_2\text{O}$  and  $\text{H}_2\text{SO}_4$  are .....

(a)  $\text{OH}^-$  and  $\text{HSO}_4^-$  (b)  $\text{H}_4\text{O}$  and  $\text{SO}_4^{2-}$  (c)  $\text{OH}^-$  and  $\text{SO}_4^{2-}$  (d)  $\text{H}_3\text{O}^+$  and  $\text{HSO}_4^-$

9. The dissociation constant of a weak acid is  $1.0 \times 10^{-10}$ . The equilibrium constant for the reaction with strong base is

(a)  $1.0 \times 10^{-5}$  (b)  $1.0 \times 10^{-9}$  (c)  $1.0 \times 10^9$  (d)  $1.0 \times 10^{14}$

10. The pH of a solution at  $25^\circ\text{C}$  containing 0.10 M sodium acetate and 0.03 M acetic acid is ..... ( $\text{pK}_a$  for  $\text{CH}_3\text{COOH} = 4.57$ ) (a) 4.09 (b) 5.09 (c) 6.10 (d) 7.09

11. A weak acid is 0.1% ionised in 0.1 M solution. Its pH is .....

(a) 2 (b) 3 (c) 4 (d) 1

12. The pH of pure water or neutral solution at  $50^\circ\text{C}$  is ..... ( $\text{pK}_w = 13.2613$  at  $50^\circ\text{C}$ )

(a) 7.0 (b) 7.13 (c) 6.0 (d) 6.63

13. What is the pH of 1 M  $\text{CH}_3\text{COOH}$  solution?

$\text{K}_a$  of acetic acid is  $1.8 \times 10^{-5}$ .  $\text{K} = 10^{-14} \text{ mol}^2 \text{ litre}^{-2}$ . (a) 9.4 (b) 4.8 (c) 3.6 (d) 2.4

14. The pH of 0.001 M NaOH will be .....

(a) 3 (b) 2 (c) 11 (d) 12

15. When solid potassium cyanide is added in water then .....

(a) pH will increase (b) pH will decrease (c) pH will remain the same (d) electrical conductivity will not change

16. pH of a solution is 5. Its hydroxyl ion concentration is .....

(a) 5 (b) 10 (c)  $10^{-5}$  (d)  $10^{-9}$

17. Which one of the following is a buffer?  
(a)  $\text{CH}_3\text{COOH} + \text{CH}_3\text{COONa}$  (b)  $\text{CH}_3\text{COOH} + \text{CH}_3\text{COONH}_4$  (c)  $\text{NaOH} + \text{NaCl}$  (d)  $\text{CH}_3\text{COOH} + \text{NH}_4\text{Cl}$

18. By adding a strong acid to the buffer solution, the pH of the buffer solution .....

(a) remains constant (b) increases (c) decreases (d) becomes zero

19. The unit of ionic product of water K is .....

(a)  $\text{mol}^{-1} \text{ L}^{-1}$  (b)  $\text{mol}^{-2} \text{ L}^{-2}$  (c)  $\text{mol}^{-2} \text{ L}^{-1}$  (d)  $\text{mol}^2 \text{ L}^{-2}$

20. What is the correct representation of the solubility product constant of  $\text{Ag}_2\text{CrO}_4$

(a)  $[\text{Ag}^+]^2 [\text{CrO}_4^{2-}]$  (b)  $[\text{Ag}^+] [\text{CrO}_4^{2-}]$  (c)  $[2\text{Ag}^+] [\text{CrO}_4^{2-}]$  (d)  $[2\text{Ag}^+]^2 [\text{CrO}_4^{2-}]$

21. Which pair will show common ion effect?

(a)  $\text{BaCl}_2 + \text{Ba}(\text{NO}_3)_2$  (b)  $\text{NaCl} + \text{HCl}$  (c)  $\text{NH}_4\text{OH} + \text{NH}_4\text{Cl}$  (d)  $\text{AgCN} + \text{KCN}$

### Lesson-9

1. Electro chemical reactions are generally

(a) Reduction reactions (b) oxidation reactions (c) Redox reactions (d) condensation reactions

2. The unit of resistivity is

(a)  $\Omega \text{ m}^{-1}$  (b)  $\Omega \text{ m}$  (c)  $\text{m}^{-1} \text{ Ohm}^2$  (d)  $\Omega^{-1} \text{ m}^{-1}$

3. The unit of specific resistance is equal to

(a) Ohm metre (b) Ohm-1 metre (c) Ohm-1 metre-1 (d) Ohm

4. Which is the SI unit of conductance?

(a) Siemen-1 (or)  $\text{S}^{-1}$  (b) Siemen (or) S (c)  $\text{Sm}^{-1}$  (d)  $\text{S}^{-1} \text{ m}^{-1}$

5. Which one is the unit of specific conductance?  
(a) Ohm m (b) Ohm-1 m (c) Ohm m-1 (d) Ohm-1 m -1 .
6. The unit of equivalent conductance is .....  
(a) Sm<sup>2</sup> g equivalent (b) Sm-1 (c) Ohm-1m -1 (d) Ohm m
7. Which one of the following is used to measure conductivity of ionic solutions?  
(a) metre scale (b) wheat stone bridge (c) Dynamo (d) Ammeter
8. Which of the following is used to calculate the conductivity of strong electrolytes?  
(a) Kohlraush's law (b) Henderson equation (c) Debye-Huckel and Onsagar equation (d) Ostwald's dilution law
9. Which one of the following represents Debye-Huckel and Onsagar equation?
10. Kohlrausch's law is applied to calculate  
(a) molar conductance at infinite dilution of a weak electrolyte (b) degree of dissociation of weak electrolyte (c) solubility of a sparingly soluble salt (d) all the above
11. The salt bridge used in Daniel cell contains (a) Na<sub>2</sub>SO<sub>4</sub> + NaCl (b) Agar-Agar gel + Na<sub>2</sub>SO<sub>4</sub> (c) Silica gel + CuSO<sub>4</sub> (d) ZnSO<sub>4</sub> + CuSO<sub>4</sub>
12. Which one of the following can act as an inert electrode?  
(a) Graphite (b) Copper (c) Platinum (d) either a (or) e
13. The emf of Daniel cell Zn(s) + Zn<sup>2+</sup> aq(1m) || Cu<sup>2+</sup> aq(1m) | Cu(s) is equal to .....  
(a) - 1.107 Volts (b) 1.107 Volts (c) 3.4 Volt (d) 7.6 Volt
14. The value of EMF of standard hydrogen electrode at 25°C is .....  
(a) maximum (b) zero (c) negative (d) positive
15. The electrode used in SHE is made of .....  
(a) graphite (b) copper (c) platinum (d) iron
16. The maximum work that can be obtained from a galvanic cell is .....  
(a) + nFE (b) - nFE (c) 2F (d) 96500 F
17. For all spontaneous cell reactions, the value of ΔG should be .....  
(a) constant (b) zero (c) negative (d) positive
18. The value of one Faraday is equal to .....  
(a) 96400 C (b) 96500 C (c) 1 .602 x 10<sup>-19</sup>C (d) 1 .602 x 10<sup>19</sup>C
19. Which equation relates the cell potential and the concentration of the species involved in an electro chemical reaction?  
(a) Henderson equation (b) Arrhenius equation (c) Debye Huckel Onsagar equation (d) Nernst equation
20. Which one of the following is Nernst equation.
21. Which one of the following represents Faraday's first law?  
(a) m = Zit (b) m = Z/It (c) m = It/Z (d) Z = mIt
22. When 1 coulomb of electric current is passed the amount of substance deposited or liberated is known as  
(a) equivalent mass (b) electro chemical equivalent (c) molar mass (d) 1 Faraday
23. Which one of the following is used in cell phone, dry cell in flashlight?  
(a) Zn - Cu battery (b) Li - ion battery (c) Ag - Cu battery (d) Na, NaCl battery
24. The primary batteries are .....  
(a) rechargeable (b) non - rechargeable (c) reversible (d) renewable
25. The anode and cathode used in Leclanche cell are ..... respectively.  
(a) Zinc, Graphite rod with MnO<sub>2</sub> (b) Graphite rod in MnO<sub>2</sub> and Zinc container (c) Zn container and copper rod (d) Copper container and Zinc rod
26. Which electrolyte is used in Leclanche cell?  
(a) ZnSO<sub>4</sub> + CuSO<sub>4</sub> (b) NH<sub>4</sub>Cl + ZnCl<sub>2</sub> (c) NaCl + CuSO<sub>4</sub> (d) MnSO<sub>4</sub> + MnO<sub>2</sub>
27. Which one of the following is used as cathode in Mercury button cell?  
(a) Zinc (b) Copper (c) Zinc amalgamated with mercury (d) HgO mixed with graphite
28. Which one of the following is used as anode in Mercury button cell?

(a) HgO mixed with graphite (b) Zinc amalgamated with mercury (c) Copper amalgamated with Mercury (d) HgO mixed with Copper

29. The value of cell emf of Mercury button cell is .....

(a) 1.35V (b) - 0.76V (c) 0.34V (d) 100V

30. The electrolyte used in Mercury button cell is

(a) Paste of KOH and ZnO (b) CuSO<sub>4</sub> + ZnSO<sub>4</sub> (c) NaCl + MgCl<sub>2</sub> (d) NH<sub>4</sub>Cl + ZnCl<sub>2</sub>

31. Which of the following is an example of secondary batteries?

(a) Mercury button cell (b) Leclanche cell (c) Lead storage battery (d) Daniel cell

32. Which of the following act as cathode and anode in Lead storage battery?

(a) Lead plate bearing PbO<sub>2</sub>, spongy Lead (b) Spongy lead, lead plate bearing PbO<sub>2</sub> (c) Lead Copper (d) Mercury oxide, PbO

33. Which one of the following is used as an electrolyte in H<sub>2</sub>O<sub>2</sub> fuel cell?

(a) Aqueous CuSO<sub>4</sub> (b) Aqueous CoO<sub>2</sub> (c) Aqueous KOH (d) NH<sub>4</sub>Cl + ZnCl<sub>2</sub>

34. The formula of rust is .....

(a) Fe<sub>2</sub>O<sub>3</sub> (b) Fe<sub>2</sub>O<sub>3</sub>.xH<sub>2</sub>O (c) FeO (d) FeO.xH<sub>2</sub>O

35. The electro plating of Zinc over a metal is called .....

(a) Electrolysis (b) Redox reaction (c) Galvanisation (d) Passivation

36. Which amount of chlorine gas liberated at anode, if 1 ampere current is passed for 30 minutes from NaCl solution?

(a) 0.66 moles (b) 0.33 moles (c) 0.66 g (d) 0.33 g

### Lesson 10

1. When gas molecules are held to the surface by the formation of chemical bond the heat energy released is nearly equal to

(a) 40 kJ/mole (b) 800 kJ/mole (c) 400 kJ/mole (d) 4 kJ/mole

2. Consider the following statements

: (i) In chemisorption, heat of adsorption is high (ii) Monolayer of the adsorbate is formed during chemisorption (iii) Physisorption increases with increase in temperature. Which of the above statement is / are not correct?

(a) (i) & (ii) (b) (iii) only (c) (ii) only (d) (i) only

3. Which of the following gases is not a permanent gas?

(a) NH<sub>3</sub> (b) H<sub>2</sub> (c) N<sub>2</sub> (d) O<sub>2</sub>

4. Which is employed in the softening of hardwater to absorb Ca<sup>2+</sup> and Mg<sup>2+</sup> ions?

(a) Alumina (b) Silica gel (c) Permutit (d) Charcoal

5. Which of the following is used in petroleum refining and refining of vegetable oils?

(a) Charcoal (b) Silica gel (c) Permutit (d) Nickel

6. The catalyst used in the hydrogenation of oils to obtain vanaspathi is .....

(a) Iron (b) Molybdenum (c) Nickel (d) Copper

7. The catalyst and promoter used in Haber's process are respectively .....

(a) Mo, Fe (b) Fe, Mo (c) Pt, H<sub>2</sub>S (d) Pt, V<sub>2</sub>O<sub>5</sub>

8. Which method is used for identification, detection and estimation of many substances even if they are in micro quantities?

(a) Lassaigne's test (b) Canus method (c) Kjeldhals method (d) Chromatography

9. Which one of the following is an example for heterogeneous catalysis?

(a) Decomposition of acetaldehyde by I<sub>2</sub> catalyst (b) Decomposition of H<sub>2</sub>O<sub>2</sub> in the presence of Pt catalyst (c) Acid hydrolysis of ester (d) Hydrolysis of cane sugar with mineral acid

10. The catalyst poison in contact process of manufacture of SO<sub>3</sub> is .....

(a) As<sub>2</sub>O<sub>3</sub> (b) H<sub>2</sub>S (c) CO (d) As<sub>2</sub>S<sub>3</sub>

11. In Haber's process of manufacture of ammonia, the Fe catalyst is poisoned by the pressure of

(a) Mo (b) Co (c) H<sub>2</sub>S (d) As<sub>2</sub>O<sub>3</sub>

12. In the reaction 2H<sub>2</sub> + O<sub>2</sub> → 2H<sub>2</sub>O acts as a catalytic poison for Pt catalyst

(a) Co (b) Mo (c) As<sub>2</sub>O<sub>3</sub> (d) H<sub>2</sub>S

13. The negative catalyst in the decomposition of H<sub>2</sub>O<sub>2</sub> is .....

- (a) Ethanol (b) Acetic acid (c) Ethanoic acid (d) Methanol
14. The energy required for the reactants to reach the activated complex is called .....
- (a) threshold energy (b) activation energy (c) internal energy (d) Gibbs free energy
15. Which enzyme catalyses the conversion of glucose into ethanol?
- (a) maltase (b) invertase (c) diastase (d) zymase
16. Which one of the following is used as a catalyst in the conversion of Lindane to cyclohexane?
- (a)  $\text{Fe}^\circ/\text{Pd}^\circ$  (b) Ni (c) Zn + HCl (d)  $\text{LiAlH}_4$
17. An example of liquid aerosol is .....
- (a) Soda water (b) Milk (c) Fog (d) Inks
18. Which method is used to prepare metal sols?
- (a) ultrasonic dispersion (b) mechanical dispersion (c) Bredigs arc method (d) peptisation
19. Which method is used to prepare mercury colloid?
- (a) peptisation (b) mechanical dispersion (c) ultrasonic dispersion (d) Bredig's arc method
20. The conversion of a precipitate into colloid is called .....
- (a) coagulation (b) hydrolysis (c) condensation (d) peptisation
21. The process of conversion of colloidal solution into precipitate is known as .....
- (a) peptisation (b) dispersion (c) coagulation (d) decomposition
22. Which of the following is the size of the colloidal particle?
- (a) 100  $\mu\text{m}$  diameter – 1000  $\mu\text{m}$  diameter (b) 1  $\text{m}\mu$  to 1  $\mu\text{m}$  diameter (c) 1  $\text{m}\mu$  to 100  $\mu\text{m}$  diameter (d) 1  $\mu\text{m}$  to 1  $\mu\text{m}$  diameter
23. The shape of tungstic acid  $\text{W}_3\text{O}_5$  sol is .....
- (a) spherical (b) disc (c) plate like (d) rod like
24. Which one of the following colloid has spherical shape?
- (a)  $\text{AS}_2\text{S}_3$  (b)  $\text{Fe}(\text{OH})_3$  (c)  $\text{W}_3\text{O}_5$  (d) dust
25. Tyndall effect is possible in colloid due to .....
- (a) absorption of light (b) adsorption of light (c) scattering of light (d) reflection of light
26. The migration of sol particles under the influence of electric field is called .....
- (a) electro osmosis (b) electro dialysis (c) electrophoresis (d) dialysis
27. The movement of dispersion medium under the influence of electric potential is called .....
- (a) Electrophoresis (b) Cataphoresis (c) Electro osmosis (d) Electro dialysis
28. Which one of the following is not used to identify the types of emulsion?
- (a) dye test (b) viscosity test (c) conductivity test (d) Tollen's test
29. Which one of the following is used in the purification of drinking water?
- (a) silver sol protected by gelatin (b) milk of magnesia (c) Alum containing  $\text{Al}^{3+}$  (d) Argyrol
30. Which one of the following is used in tanning of leather?
- (a) chromium salt (b) colloidal Au (c) Argyrol (d)  $\text{Fe}(\text{OH})_3$
31. Which one of the following is used to distinguish Natural honey and artificial honey?
- (a) Ammoniacal  $\text{AgNO}_3$  (b) Fehling's solution (c) Arsenic sulphide sol (d) gelatin
32. Gold number gives .....
- (a) the amount of gold present in the colloid (b) the amount of gold required to break the colloid (c) the amount of gold required to protect the colloid (d) the measure of protective power of a lyophilic colloid

### Lesson-11

3. Which of the following is a dihydric alcohol?
- (a) Ethenol (b) Ethanol (c) Ethane – 1, 2 – diol (d) Propan – 2 – ol
4. Which one of the following is an example of secondary ( $2^\circ$ ) alcohol?
- (a) Propan – 2 – ol (b) Phenyl methanol (c) Ethenol (d) 2 – methyl – propan – 2 – ol

5. Which acts as an additive to petrol?  
 (a) Glycerol (b) Ethanol (c) Phenol (d) Methanol
6. The IUPAC name of  
 (a) 1 - methyl - 2 - propanol (b) 2 - methyl - propan - 2 - ol  
 (c) Tertibutyl alcohol (d) 2 - propanol
7. The IUPAC name of  $\text{CH}_2 = \text{CH} - \text{CH}_2\text{OH}$  is .....  
 (a) Allyl alcohol (b) Propenc - 2 - ol (c) Prop - 2 - en - 1 - ol (d) Isopropyl alcohol
8. Which one of the following is named as Baeyer's reagent?  
 (a) acidified  $\text{K}_2\text{Cr}_2\text{O}_7$  (b) acidified  $\text{KMnO}_4$  (c) Cold dilute alkaline  $\text{KMnO}_4$  (d)  $\text{LiAlH}_4$
9. Which one of the following is called Lucas reagent?  
 (a) Conc.  $\text{HCl} + \text{Anhydrous ZnCl}_2$  (b) Conc.  $\text{HCl} + \text{Anhydrous AlCl}_3$   
 (c)  $\text{LiAlH}_4 + \text{H}_2\text{O}$  (d) Cold dilute alkaline  $\text{KMnO}_4$
10. Which colour is given by secondary alcohol in Victor Meyer's test?  
 (a) Red (b) Green (c) Blue (d) Yellow
11. Which mechanism is followed in the conversion of ethanol to bromoethane by  $\text{HBr}$ ? (a)  $\text{S}_{\text{N}}1$  mechanism (b)  $\text{S}_{\text{N}}2$  mechanism (c)  $\text{E}1$  mechanism (d)  $\text{E}2$  mechanism
12. Which one of the following is the correct order of relative reactivities of alcohols in the dehydration reaction? (a)  $1^\circ < 2^\circ < 3^\circ$  (b)  $2^\circ < 1^\circ < 3^\circ$  (c)  $3^\circ < 2^\circ < 1^\circ$  (d)  $3^\circ < 1^\circ < 2^\circ$
13. Which reaction is used to convert alcohol to ketone / aldehyde in the presence of DMSO?  
 (a) Lucas test (b) Swern oxidation (c) Biological oxidation (d) Kolbe's reaction
14. What is the name of the reaction between ethanol and ethanoic acid?  
 (a) Esterification (b) Saponification (c) Ethenfication (d) Hydroxylation
15. What is the product formed when ethylene glycol is heated at 773 K?  
 (a) Ethanal (b) Ethene (c) Ethane (d) Oxirane
16. Which one of the following is formed when ethane - 1, 2 - diol is treated with Conc.  $\text{H}_2\text{SO}_4$ ?  
 (a) 1, 4 - dioxane (b) Ethanal (c) Ethanoic acid (d) Ethene
17. Which one of the following is formed when ethylene glycol is treated with periodic acid?  
 (a) Methanal (b) Methanol (c) Ethanol (d) Ethanal
18. Identify the product formed when glycerol is treated with nitric acid and conc.  $\text{H}_2\text{SO}_4$ ?  
 (a) Nitroglycerine (b) Glyceryl triacetate (c) Prop - 2 - enal (d) Glyceric acid
19. Oxidation of glycerol with dil.  $\text{HNO}_3$  gives .....  
 (a) Meso oxalic acid (b) Glyceric acid and tartronic acid  
 (c) Glycerose (d) Glyceraldehyde and dihydroxy acetone
20. Which one of the following is the correct decreasing order of acidity in alcohol?  
 (a)  $1^\circ$  alcohol >  $2^\circ$  alcohol >  $3^\circ$  alcohol (b)  $3^\circ$  alcohol >  $2^\circ$  alcohol >  $1^\circ$  alcohol  
 (c)  $2^\circ$  alcohol >  $1^\circ$  alcohol >  $3^\circ$  alcohol (d)  $3^\circ$  alcohol >  $1^\circ$  alcohol >  $2^\circ$  alcohol
21. The other name of 1, 2, 3 - trihydroxy benzene is called .....  
 (a) Phloroglucinol (b) Quinol (c) Pyrogallol (d) Hydroxy quinol
22. The IUPAC name of Catechol is known as .....  
 (a) 1, 3 - dihydroxy benzene (b) 1, 2 - dihydroxy benzene  
 (c) 1, 4 - dihydroxy benzene (d) 1, 3, 5 - trihydroxy benzene
23. The reaction of chlorobenzene with  $\text{NaOH}$  is known as .....  
 (a) Kolbe's reaction (b) Riemcr - Ticmann reaction (c) Dow's process (d) Cumene synthesis
24. What will be the product formed when phenol is treated with zinc dust?  
 (a) Cumene (b) Toluene (c) Ethyl benzene (d) Benzene
25. The acetylation and benzoilation of phenol are called .....

- (a) Dow's process (b) Schotten – Baumann reaction  
(c) Reimer – Tiemann reaction (d) Williamson ether synthesis
26. Which one of the following is formed when phenol reacts with a mixture of Conc. HNO<sub>3</sub> and Conc.H<sub>2</sub>SO<sub>4</sub>?
- (a) Ortho nitro phenol (b) Para nitro phenol  
(c) 1, 2 – dinitro phenol (d) 2, 4 , 6 – trinitro phenol
27. The conversion reaction of phenol of salicylic acid is known as
- (a) Schottan – Baumann reaction (b) Riemer – Ticmann reaction  
(c) Kolbe's Schmitt reaction (d) Williamson's synthesis
28. What is the name of the reaction of phenol with chloroform and aqueous alkali?
- (a) Kolbe's reaction (b) Cumene synthesis  
(c) Riemer – Tiemann reaction (d) Schottan – Baumann reaction
29. Which one of the following is formed when phenol is treated with chloroform and sodium hydroxide. (a) Chlorobenzene (b) Salicylaldehyde  
(c) Salicylic acid (d) Aniline
30. Which one of the following is formed when Phenol reacts with benzene diazonium chloride?
- (a) P – hydroxy diazo phenol (b) P – hydroxy azo benzene  
(c) O – hydroxy benzene (d) O – hydroxy azo benzene
31. Bakelite is formed when phenol reacts with .....
- (a) Methanol (b) Methanal (c) Ethanal (d) Ethanol
32. Which one of the following is an example for mixed ether?
- (a) Methoxy methane (b) Phenoxy benzene (c) Methoxy benzene (d) Ethoxy ethane

33. Identify the product formed when ethanol is treated with Conc.H<sub>2</sub>SO<sub>4</sub> at 413 K?
- (a) Ethene (b) Ethane (c) 2 – butanol (d) Diethyl ether
34. The mechanism involved in Williamson's synthesis is .....
- (a) E1 (b) E2 (c) SN2 (d) SN1
35. Anisole undergoes bromination with Br<sub>2</sub> in acetic acid in the absence of catalyst, the major product formed is
- (a) O – bromoan isole (b) P – bromoan isole (c) Benzyl bromide (d) Bromo benzene
36. Which one of the following is used as a surgical anesthetic agent in surgery?
- (a) Ethanol (b) Ethoxy ethane (c) Methoxy ethane (d) Methoxy propane
37. Oxygen atom in ether is .....
- (a) very active (b) replacable (c) comparatively inert (d) less active

### Lesson-12

1. The IUPAC name of Acrolein is
- (a) Prop – 2 – enal (b) Propanal (c) Ethenal (d) 1 – butanal
2. The conversion of acetyl chloride to acetaldehyde by the action of Pd/BaSO<sub>4</sub> is called ..... (a) Perkin's reaction (b) Stephens reaction (c) Clemmenson reduction (d) Rosenmund reduction
3. In Rosenmunds reduction, the action of BaSO<sub>4</sub> is .....
- (a) Promoter (b) Catalyst poison (c) Positive catalyst (d) Negative catalyst
4. The conversion reaction of Benzene to Benzaldehyde is known as .....
- (a) Rosenmund reduction (b) Stephen reduction (c) Gattermann koch reaction (d) Friedel – crafts reaction
5. The product formed when Benzoyl chloride reacts with benzene is .....
- (a) Benzyl benzoate (b) Benzophenone (c) Benzyl chloride (d) Benzyl alcohol



6. Which one of the following is used as catalyst in Friedel Crafts reaction?

(a) Anhydrous  $ZnCl_2$  (b) Anhydrous  $CuCl_2$  (c) Anhydrous  $AlCl_3$  (d) Anhydrous  $CaCl_2$

7. Which one of the following is formed when methanal reacts with ammonia?

(a) Tetramethylene hexamine (b) Hexamethylene tetramine (c) Formaldehyde ammonia (d) Aldimine

8. Which one of the following is used as, an urinary antiseptic?

(a) Urotropine (b) Urea formaldehyde (c) Formalin (d) Aldimm

9. Which one of the reactions gives an explosive RDX?

(a) Nitration of phenol (b) Nitration of glycol (c) Nitration of urotropine (d) Nitration of glycerol

10. The product formed when Acetone is subjected to Clemmenson reduction is .....

(a) Acetic acid (b) Propanoic acid (c) Propane (d) Propanal

11. The reaction of benzaldehyde with 50% NaOH is called .....

(a) Benzoin condensation (b) Claisen – schmidt reaction (c) Perkin's reaction (d) Cannizaro reaction

12. The reaction of phenyl methanal and ethanal in the presence of dilute NaOH is known as .....

(a) Cannizaro reaction (b) Aldol condensation (c) Claisen – schmidt condensation (d) Perkin's reaction

13. Which one of the following is formed when benzaldehyde reacts with alcoholic KOH?

(a) Benzyl alcohol (b) Potassium benzoate (c) Benzoin (d) Benzoic acid

14. What is the name of the reaction between Benzaldehyde and acetic anhydride?

(a) Peridin's reaction (b) Knoerenagal reaction (c) Cannizaro reaction (d) Kolbe's reaction

15. Which one of the following is the formula of Schiff's base?

(a)  $C_6H_5 - NH - NH_2$  (b)  $C_6H_5 - CH = N - C_6H_5$  (c) Perkin's reaction (d) Aldol condensation

(a) Pyrimidine (b) Pyridine (c) PCC (d)  $CdCl_2$

17. Which one of the following is used to test ketones?

(a) Iodoform test (b) Tollen's reagent test (c) Fehling's solution test (d) Benedict's solution test

18. Which one of the following is used as a hypnotic?

(a) Acetaldehyde (b) Formalin (c) Paraldehyde (d) Formaldehyde

19. Which one of the following is used as nail polish remover?

(a)  $CH_3CHO$  (b)  $HCHO$  (c)  $CH_3COCH_3$  (d)  $C_6H_5COCH_3$

20. The reaction of acetic acid with  $Cl_2$  and red phosphorous is named as .....

(a) Kolbe's reaction (b) Reimer – Tiemann reaction (c) Hell – volhard – zelinsky reaction (d) Knoevenagal reaction

21. Which is one the correct order of strength of carboxylic acid? The correct increasing order acid strength of carboxylic acid is .....

(a)  $F - CH_2 - COOH > I - CH_2 - COOH > Cl - CH_2 - COOH > Br - CH_2 - COOH$  (b)  $Br - CH_2 - COOH > F - CH_2COOH > I - CH_2COOH > Cl - CH_2 - COOH$  (c)  $F - CH_2 - COOH > Cl - CH_2COOH > Br - CH_2COOH > I - CH_2COOH$  (d)  $Br - CH_2 - COOH > Cl - CH_2 - COOH > I - CH_2COOH > F - CH_2COO$

22. The conversion of Ethyl acetate to propyl acetate by the action of propyl alcohol is named as

(a) Esterification (b) Transesterification (c) Acid hydrolysis of ester (d) Alkaline hydrolysis of ester

23. Which one of the following is used as food preservative?

(a) Sodium formate (b) Sodium acetate (c) Sodium benzoate (d) Acetamide

24. Which one of the following is used in the preparation of medicine like aspirin and phenacetin?

(a) Acetyl chloride (b) Acetic acid (c) Acetamide (d) Acetic anhydride

25. Which of the following will not give iodoform test?

(a) Isopropyl alcohol (b) Ethanol (c) Eth anal (d) Benzyl alcohol

26. The addition of HCN to carbonyl compounds is an example of .....

(a) N ucleophilic substitution (b) Electrophil ic addition (c) Nucleophilic addition (d) Electrophilic substitution

28. The molecular formula of Urotropine is .....

- (a)  $(\text{CH}_2)_6\text{N}_4$  (b)  $(\text{CH}_2)_4\text{N}_6$  (c)  $(\text{CH}_2)_2\text{N}_2$  (d)  $(\text{CH}_2)_6\text{N}_6$

### Lesson-13

1. Which one of the following is act as neurotransmitter?

- (a) Pyridoxine (b) Histamine (c) Dopamine (d) Cyano cobalamine

2. Which one of the following is an example of primary nitro alkane?

- (a) 2 - nitropropane (b) Ethyl nitrite (c) Nitro ethane (d) 2 - methyl - 2 - nitropropane

3. Nitro methane and methyl nitrite are the examples of .....

- (a) Position isomerism (b) chain isomerism (c) metarnersm (d) Tautomerism

4. Which of the following is called oil of mirbane?

- (a) Nitro methane (b) Nitro propane (c) Nitro benzene (d) Nitro ethane

5. On direct nitration of nitro benzene gives .....

- (a) 0 - dinitro benzene (b) m - dinitro benzene (c) p - dinitro benzene (d) 2, 4, 6 - trinitrobenzene

6. Which one of the following is formed when nitro methane reacts with chlorine and NaOH?

- (a)  $\text{CH}_3\text{Cl}$  (b)  $\text{CH}_3\text{COCl}$  (c)  $\text{CCl}_3\text{NO}_2$  (d)  $\text{CHCl}_2\text{NO}_2$

7. What is the IUPAC name of

- (a) Tertiary butyl amine (b) Trimethyl amine (c) N, N - dimethyl methanamine (d) N - methyl ethanamine

8. The IUPAC name of

- (a) Methyl iso propyl amine (b) N - methyl propan - 1 - amine (c) N, N - dimethyl methanamine (d) propan - 1 - amine

9. In which reaction acetamide is changed to methylamine by the action of  $\text{Br}_2/\text{KOH}$ ?

- (a) Gabriel phthalimide synthesis (b) Hoffmann degradation reaction (c) Mendius reaction (d) Mustard oil reaction

10. Which one of the reaction is used in the synthesis of aliphatic primary amines?

- (a) Hoffmann ammonolysis (b) Rosenmund's reduction (c) Carbylamine reaction (d) Gabriel phthalimide synthesis

11. The conversion of ethanol into all types of amines by the action of ammonia along with Alumina is (a) HVZ reaction (b) Sabatier - mailhe method (c) Carbylamine reaction (d) Mendius reaction

12. The relative basicity of amine follows the order as .....

- (a) Alkyl amines > Aralkyl amines > Ammonia > N - aralkylamine > Arylamine (b) Aralkyl amines > Ammonia > Arylamine > Alkyl amine > N - aralkylamine (c) Arylamine > Alkyl amine > N - aralkylamine > Ammonia > Alkyl amine < Aralkyl amine < Arylamine < Ammonia < Alkyl amine < Aralkyl amine

13. Identify the name of the reaction in which aniline reacts with Benzoyl chloride to form N - Phenyl benzamide?

- (a) Hoffmann degradation reaction (b) Gabriel phthalimide synthesis (c) Schotten - Baumann reaction (d) Mustard oil reaction

14. The reaction of aniline with nitrous acid at low temperature is known as .....

- (a) Carbylamine reaction (b) mustard oil reaction (c) Diazotisation (d) Sand meyer's reaction

15. Which one of the following reaction is used to identify primary amines?

- (a) Schotten - Baumann reaction (b) Carbylamine reaction (c) Sand meyer's reaction (d) Gattermann reaction

16. The reaction between methylamine and  $\text{CS}_2$  is known as .....

- (a) mustard oil reaction (b) Carbylamine reaction (c) Sand meyer's reaction (d) Gabriel phthalirnid synthesis

17. The conversion of Benzene diazonium chloride into chlorobenzene is known as .....

- (a) Gabriel phthalimide synthesis (b) Carbylamine reaction (c) Sand meyer reaction (d) Coupling reaction

18. What is the name of the reaction in which benzene diazonium chloride react with benzene to give Biphenyl?

- (a) Sandmeyer's reaction (b) Gomberg reaction (c) Gattermann reaction (d) Baltz - schiemann reaction

19. Chloropicrin is used as

(a) antiseptic (b) analgesic (c) insecticide (d) fertilizer

20. Replacement of diazonium group by fluorine is known as .....

(a) Gattennann reaction (b) Sandmeyer reaction (c) Baltz – Schiemann reaction (d) Comberg reaction  
21. Which one of the following is the strongest base in aqueous solution?

(a) Trimethyl amine (c) Dimethyl amine (d) methyl amine (b) Aniline

22. Liebermann's nitroso reaction is used for testing .....

(a) 1° amine (b) 2° amine (c) 3° amine (d) all the above

23. Carbylamine test is used in the detection of .....

(a) aliphatic 2° amine (b) Aromatic 1° amine (c) Aliphatic 1 amine (d) both aliphatic and aromatic 1° amine

#### Lesson-14

1. How many isomers are possible for glucose that have 4 asymmetric carbon atoms?

(a) 8 isomers (b) 16 isomers (c) 2 isomers (d) 4 isomers

2. How many asymmetric carbon atoms are in glucose?

(a) 4 (b) 3 (c) 2 (d) 1

3. Which one of the following will reduce Tollen's reagent and Fehling's solution?

(a) Glucose (b) Fructose (c) Sucrose (d) Maltose

4. The specific rotation of pure  $\alpha$  and  $\beta$  (D) glucose are respectively.

(a) 18.7°, 112° (b) 112°, 18.7° (c) 90°, 90° (d) 120°, 20°

5. Sugar differing in configuration at an asymmetric centre is known as .....

a) epimers (b) isomers (c) anomers (d) monomers

6. Which is the product formed when fructose undergoes partial reduction with sodium amalgam and water?

(a) Sorbital + mannitol (b) D – mannose + D – galactose (c) Gluconic acid + saccharic acid (d) Aldehyde + ketone

7. How many asymmetric carbon atoms are present in fructose?

(a) 4 (b) 3 (c) 2 (d) 6

8. Two monosaccharides are linked by to form a disaccharide.

9. The enzyme that catalyses the hydrolysis of sucrose to glucose and fructose is .....

(a) zymase (b) invertase (c) diastase (d) maltase

10. Which one of the following is an example of non – reducing sugar?

(a) Glucose (b) Dextrose (c) Lactose (d) Sucrose

11. Which one of the following gives blue colour with amylose and purple colour with amylopectin? (a) Tollen's reagent (b) Fehling's solution (c) Iodine solution (d) Bromic water

12. Which of the amino acid is optically inactive?

(a) Alanine (b) Valine (c) Glycine (d) Proline

13. Which one of the following is an example for globular protein?

(a) Kerating (b) Myoglobin (c) Collagen (d) Elastin

14. The chemical name of vitamin B9 is .....

a) biotin (b) folic acid (c) niacin (d) thiamine

15. The nucleic acid base having two possible binding sites is .....

(a) thymine (b) cytosine (c) guanine (d) adenine

16. Which one of the following is a protein hormone?

(a) Insulin (b) Androgen (c) Cortisol (d) Estrogen

17. Which one of the following is a steroid?

(a) Insulin (b) Epinephrine (c) mutin (d) Estrogen

18. A nucleotide consists of

(a) base and sugar (b) base and phosphate (c) sugar and phosphate (d) base, sugar and phosphate

19. Which one is found in ATP ribonucleotide?

(a) Guanine (b) Uracil (c) Adenine (d) Inulin

20. In nucleic acid, the correct sequence is .....

(a) base – phosphate sugar (b) phosphate – base – sugar (c) sugar – base – phosphate (d) base – sugar – phosphate

21. In DNA, the complementary bases are

(a) Uracil and adenine; cytosine and guanine (b) Adenine and thymine; guanine and cytosine (c) Adenine and guanine; thymine and cytosine (d) adenine and guanine; thymine and uracil

22. RNA is different from DNA because RNA contains .....

(a) Ribose sugar and thymine (b) Ribose sugar and uracil (c) Deoxyribose sugar and thymine (d) Deoxy ribose sugar and uracil

23. Haemoglobin is

(a) an enzyme (b) a globular protein (c) a vitamin (d) carbohydrate

24. The number of essential amino acid in man is .....

(a) 8 (b) 10 (c) 20 (d) 18

25. In fructose, the possible optical isomers are .....

(a) 12 (b) 16 (c) 8 (d) 4

### Lesson-15

1. Which one of the following is an antibiotic?

(a) erythromycin (b) atenolol (c) amlodipine (d) propranolol

2. Which one of the following is an example of antihypertensive drug?

(a) atenolol (b) amoxicillin (c) cefixime (d) tetracycline

3. Which one of the following inhibits the bacterial growth?

(a) p – amino benzoic acid (b) sulphaniilamide (c) folic acid (d) sodium benzoate

4. Which of the following is needed by many bacteria to produce folic acid?

(a) PABA (b) DHPS (c) TNB (d) GTN

5. Which one of the following binds to the receptor site should inhibit its natural function?

(a) antacids (b) antioxidant (c) antibiotics (d) antagonists

6. Which one of the following is used as an antacid?

(a) magnesium hydroxide (b) aluminium hydroxide (c) ranitidine (d) all the above

7. Which one of the following is used as painkiller? (a) Iodoform (b) chloropicrin (c) morphine (d) caffeine

8. Which one of the following is used to treat stress, anxiety, depression, sleep disorder and schizophrenia?

(a) Tranquilizer (b) antibiotic (c) analgesic (d) opioids

9. Which one of the following is an example for tranquilizer?

(a) cimetidine (b) diazepam (c) histamine (d) PABA

10. Identify the medicine that is used to treat stress, anxiety, depression and schizophrenia.

(a) valium (b) cimetidine (c) chlorofom (d) adenosine

11. Which one of the following is used to reduce fever and prevent platelet coagulation?

(a) antibiotic (b) antiseptic (c) antioxidant (d) antipyretic

12. Which of the following are used for post operative pain and pain of terminal cancer?

(a) morphine, codeine (b) ibuprofen, aspirin (c) methyl salicylate, salicylic acid (d) histidine, ranitidine

13. Which one of the following is a local anaesthetic?

(a) lidocaine (b) Propofol (c) iso flurane (d) ibuprofen

14. Which one of the following is an example of general anaesthetic?

(a) propofol (b) isoflurane (c) ranitidine (d) omeprazole

15. Identify the intravenous general anaesthetics?

(a) milk of magnesia (b) lidocaine (c) omeprazole (d) iso flurane

16. Which one of the following is used to provide relief from the allergic effects?

(a) cetirizine (b) ampicillin (c) erythromycin (d) milk of magnesia

17. Which of the following is used to treat respiratory tract infections, genital, gastrointestinal tract and skin infections?

(a) ampicillin (b) penicillin (c) terfenadine (d) azithromycin

18. Which one of the following is used to reduce the risk of infection during surgery?

(a) povidone – iodine (b) ethynyles triadiol (c) norethindrone (d) acetyl salicylic acid

19. Which one is used as preservatives for fresh vegetables and fruits?

(a) Palmitic acid (b) Palm oil (c) sodium meta sulphite (d) sulphur dioxide

20. Sodium salt of long chain allyl benzene sulphonic acids are called .....

(a) soap (b) detergent (c) disinfectant (d) antiseptic

21. Which one of the following is a natural polymer?

(a) cellulose, silk (b) PVC, Polythene (c) Buna – N, Buna – S (d) Bakelite, Nylon 6,6

22. Which one of the following catalyst is used in the preparation of high density polyethylene?

(a) benzoyl peroxide (b) zeigler natta catalyst (c) ammonium per sulphate (d) hydrogen peroxide

23. Identify the zeigler natta catalyst. (a)  $TiCl_4 + (C_2H_5)_3Al$  (b)  $(C_2H_5)_4Pb + TiCl_4$  (c)  $AlCl_3 + HCl$  (d)  $ZnCl_2 + Cone. HCl$

24. Which one of the following is used as glass reinforcing material in safety helmets?

(a) nylon (b) Bakelite (c) terylene (d) orlon

25. Which one of the following is used to prepare combs and pens?

(a) navolac (b) soft Bakelite (c) hard Bakelite (d) neoprene

26. Which one of the following is used for making unbreakable crockery?

(a) phenol formaldehyde (b) melamine formaldehyde (c) urea formaldehyde (d) navolac

27. What are the raw materials required to prepare Buna – S rubber?

(a) phenol + methanol (b) melamine + methanal (c) styrene + butadiene (d) adipic acid + methanal

28. Which one of the following element is used in vulcanization of rubber? (a) oxygen (b) nitrogen (c) carbon (d) sulphur

**ALL THE BEST...!**