12th Chemistry Volume 2 Book Back Questions in English

[New Book]

8. Ionic Equilibrium

I. Choose the Correct Answer

1. Concentration of the Ag^+ ions in a saturated solution of $Ag_2C_2O_4$ is 2.24×10^{-4} mol L^{-1} solubility product of $Ag_2C_2O_4$ is

a) 2.42×10^{-8} mol^3 L^{-3} b) 2.66×10^{-12} mol^3 L^{-3}

c) 4.5×10^{-11} mol^3 L^{-3} **d) 5.619×10^{-12} mol^3 L^{-3}**

2. Following solutions were prepared by mixing different volumes of NaOH of HCl different concentrations. (NEET – 2018)

i. 60 mL $\frac{M}{10}$ HCl + 40mL $\frac{M}{10}$ NaOH ii. 55 mL $\frac{M}{10}$ HCl + 45 mL $\frac{M}{10}$ NaOH

iii. 75 mL $\frac{M}{5}$ HCl + 25mL $\frac{M}{5}$ NaOH iv. 100 mL $\frac{M}{10}$ HCl + 100 mL $\frac{M}{10}$ NaOH

pH of which one of them will be equal to 1?

a) iv b) i c) ii **d) iii**

3. The solubility of $BaSO_4$ in water is 2.42×10^{-3} Gl^{-1} at 298K. The value of its solubility product (K_{sp}) will be (Given molar mass of $BaSO_4$ =233g mol^{-1})

a) 1.08×10^{-14} mol^2 L^{-2} b)1.08×10^{-12} mol^2 L^{-2}

c) 1.08×10^{-10} mol^2 L^{-2} d) $1.08 \times 10^{-8} mol^2$ L^{-2}

4. pH of a saturated solution of $Ca(OH)_2$ is 9. The Solubility product (K_{sp}) of $Ca(OH)_2$

a) 0.5×10^{-15} b) 0.25×10^{-10}

c) 0.125×10^{-15} d) 0.5×10^{-10}

5. Conjugate base for Bronsted acids H_2O and HF are

a) OH^- and H_2 FH^+, respectively b) H_3O^+ and F^- , respectively

c) OH^- and F^- , respectively d) H_3O^+ and H_2F^+ , respectively

6. Which will make basic buffer?

a) 50 mL of 0.1M NaOH+25mL of 0.1M CH_3 COOH

b) 100 mL of 0.1M CH_3 COOH+100 mL of 0.1M NH_4 OH

c) 100 mL of 0.1M HCl+200 mL of 0.1M NH_4 OH

d) 100 mL of 0.1M HCl+100 mL of 0.1M NaOH

7. Which of the following fluro compounds is most likely to behave as a Lewis base?

a) BF_3 **b) PF_3** c) CF_4 d) SiF_4

8. Which of these is not likely to act as Lewis base?

a) BF_3 b) PF_3 c) CO d) F^-

9. What is the decreasing order of strength of bases? OH^- , NH^-_2 , H - C ≡ C^- and $CH_3 – CH^-_2$

a) OH^- , NH^-_2 , H - C ≡ C^- > $CH_3 – CH^-_2$

b) NH^-_2 > OH^- > $CH_3 – CH^-_2$ > H - C ≡ C^-

c) $CH_3 – CH^-_2$ > NH^-_2 > H - C ≡ C^- > OH^-

d) OH^- > H - C ≡ C^- > $CH_3 – CH^-_2$ > NH^-_2

10. The aqueous solutions of sodium formate, anilinium chloride and potassium cyanide are respectively

a) acidic, acidic, basic **b) basic, acidic, basic**

c) basic, neutral, basic d) none of these

11. The percentage of pyridine (C_5H_5N) that forms pyridinium ion (C_5H_5NH) in a 0.10M aqueous pyridine solution (K_b for C_5H_5N= 1.7×10^{-9}) is

a) 0.006% **b) 0.013%** c) 0.77% d) 1.6%

12. Equal volumes of three acid solutions of pH 1,2 and 3 are mixed in a vessel. What will be the H^+ ion concentration in the mixture?

a) 3.7×10^{-2} b) 10^{-6} c) 0.111 d) none of these

13. The solubility of AgCl (s) with solubility product 1.6×10^{-10} in 0.1M NaCl solution would be

a) 1.26×10^{-5} M **b) 1.6×10^{-9}M** c) 1.6×10^{-11}M d) Zero

14. If the solubility product of lead iodide is 3.2×10^{-8} , its solubility will be

a) 2×10^{-3}M b) 4×10^{-4}M c) 1.6×10^{-5}M d) 1.8×10^{-5}M

15. Using Gibb's free energy change, DG^o=57.34 kJ mol^{-1}, for the reaction, $X_2Y(s) \rightleftharpoons 2X^+ (aq) + Y^{2-} (aq)$ calculate the solubility product of X_2 in water at 300 K (R = 8.3 J $K^{-1}Mol^{-1}$)

a) 10^{-10} b) 10^{-12}

c) 10^{-14} d) can not be calculated from the given data

16. MY and NY_3 , are insoluble salts and have the same K_{sp} values of 6.2×10^{-13} at room temperature. Which statement would be true with regard to MY and NY_3 ?

a) The salts MY and NY_3 are more soluble in 0.5M KY than in pure water

b) The addition of the salt of KY to the suspension of MY and NY_3 will have no effect on their solubility's

c) The molar solubilities of MY and NY_3 in water are identical

d) The molar solubility of MY in water is less than that of NY_3

17. What is the pH of the resulting solution when equal volumes of 0.1M NaOH and 0.01M HCl are mixed?

a) 2.0 b) 3 c) 7.0 **d) 12.65**

18. The dissociation constant of a weak acid is 1×10^{-3} . In order to prepare a buffer solution with a pH = 4, the [Acid]/[Salt] ratio should be

a) 4:3 b) 3:4 c) 10:1 **d) 1:10**

19. The pH of 10^{-5}M KOH solution will be

a) 9 b) 5 c) 19 d) none of these

20. $H_2 PO^-_4$ the conjugate base of

a) PO_4^{3-} b) P_2O_5 **c) $H_3 PO_4$** d) HPO_4^{2-}

21. Which of the following can act as Lowry – Bronsted acid as well as base?

a) HCl b) SO_4^{2-} **c) HPO_4^{2-}** d) Br^-

22. The pH of an aqueous solution is Zero. The solution is

a) slightly acidic **b) strongly acidic**

c) neutral d) basic

23. The hydrogen ion concentration of a buffer solution consisting of a weak acid and its salts is given by

a) $[H^+]=\frac{K_a[acid]}{[salt]}$ b) $[H^+]= K_a[salt]$ c) $[H^+]=K_a[acid]$ d) $[H^+]=\frac{K_a[salt]}{[acid]}$ **ANSWER: A**

24. Which of the following relation is correct for degree of hydrolysis of ammonium acetate?

a) $h = \sqrt{\frac{K_h}{C}}$ b) $h = \sqrt{\frac{K_a}{K_b}}$ c) $h = \sqrt{\frac{K_h}{K_a.K_b}}$ c) $h = \sqrt{\frac{K_a.K_b}{K_h}}$ **ANSWER: C**

25. Dissociation constant of NH_4OH is $1.8\ 10^{-5}$ the hydrolysis constant of NH_4Cl would be

a) 1.8×10^{-19} **b) 5.55×10^{-10}** c) 5.55×10^{-5} d) 1.80×10^{-5}

9. Electro Chemistry

I. Choose the correct answer

1. The number of electrons that have a total charge of 9650 coulombs is

a) 6.22×10^{23} b) 6.022×10^{24} **c) 6.022×10^{22}** c) 6.022×10^{-34}

2. Consider the following half cell reactions:

$Mn^{2+} + 2e^- \rightarrow Mn\ E^0 = -1.18V$

$Mn^{2+} \rightarrow Mn^{3+} + e^-\ E^0 = -1.51V$

The E^0 for the reaction $3\ Mn^{2+} \rightarrow Mn + 2\ Mn^{3+}$, and the possibility of the forward reaction are respectively.

a) 2.69V and spontaneous **b) -2.69 and non spontaneous**

c) 0.33V and Spontaneous d) 4.18V and non spontaneous

3. The button cell used in watches function as follows

$Zn\ (s) + Ag_2O\ (s) + H_2O\ (l) \rightleftharpoons 2\ Ag\ (s) + Zn^{2+}\ (aq) + 2OH^-$ the half cell potentials are

$Ag_2O\ (s) + H_2O\ (l) + 2e^- \rightleftharpoons 2Ag\ (s) + 2\ OH^-\ (aq)\ E^0 = 0.34V$. The cell potential will be

a) 0.84V b) 1.34V **c) 1.10V** d) 0.42V

4. The molar conductivity of a 0.5 mol dm^{-3} solution of $AgNO_3$ with electrolytic conductivity of 5.76×10^{-3} S cm^{-1} at 298 K is

a) 2.88 S cm^2 mol^{-1} **b) 11.52 S cm^2 mol^{-1}**

c) 0.086 S cm^2 mol^{-1} d) 28.8 S cm^2 mol^{-1}

5.

Electrolyte	KCl	KNO_3	HCl	NaOAC	NaCl
Λ_m (S cm^2 mol^{-1})	149.9	145.0	426.2	91.0	126.5

Calculate Λ°_{HOAC} using appropriate molar conductances of the electrolytes listed above at infinite dilution in water at 25 C^o .

a) 517.2 b) 552.7 **c) 390.7** d) 217.5

6. Faradays constant is defined as

a) charge carried by 1 electron

b) charge carried by one mole of electrons

c) charge required to deposit one mole of substance

d) charge carried by 6.22 $\times 10^{10}$ electrons.

7. How many faradays of electricity are required for the following reaction to occur $MnO_4^- \rightarrow Mn^{2+}$

a) 5F b) 3F c) 1F d) 7F

8. A current strength of 3.86 A was passed through molten Calcium oxide for 41minutes and 40 seconds. The mass of Calcium in grams deposited at the cathode is (atomic mass of Ca is 40g / mol and 1F = 9650 ^oC).

a) 4 **b) 2** c) 8 d) 6

9. During electrolysis of molten sodium chloride, the time required to produce 0.1mole of chlorine gas using a current of 3A is

a) 55 minutes **b) 107.2 minutes**

c) 220 minutes d) 330 minutes

10. The number of electrons delivered at the cathode during electrolysis by a current of 1A in 60 seconds is (charge of electron = 1.6 $\times 10^{-19}$ C)

a) 6.22 $\times 10^{23}$ b) 6.022 $\times 10^{20}$

c) 3.75 $\times 10^{20}$ d) 7.48 $\times 10^{23}$

11. Which of the following electrolytic solution has the least specific conductance

a) 2N **b) 0.002N** c) 0.02N d) 0.2N

12. While charging lead storage battery

a) $PbSO_4$ on cathode is reduced to Pb b) $PbSO_4$ on anode is oxidised to PbO_2

c) $PbSO_4$ on anode is reduced to Pb d) $PbSO_4$ on cathode is oxidised to Pb

13. Among the following cells

I) Leclanche cell

II) Nickel – Cadmium cell

III) Lead storage battery

IV) Mercury cell

Primary cells are

a) I and IV b) I and III c) III and IV d) II and III

14. Zinc can be coated on iron to produce galvanized iron but the reverse is not possible. It is because

a) Zinc is lighter than iron

b) Zinc has lower melting point than iron

c) Zinc has lower negative electrode potential than iron

d) Zinc has higher negative electrode potential than iron

15. Assertion : pure iron when heated in dry air is converted with a layer of rust.

Reason : Rust has the composition Fe_3O_4

a) if both assertion and reason are true and reason is the correct explanation of assertion.

b) if both assertion and reason are true but reason is not the correct explanation of assertion.

c) assertion is true but reason is false

d) both assertion and reason are false.

16. In $H_2 – O_2$ fuel cell the reaction occurs at cathode is

a) $O_2(g) + 2H_2O(l) + 4e^- \rightarrow 4OH^-(aq)$ b) $H^+(aq) + OH^-(aq) \rightarrow H_2O(l)$

c) $2H_2(g) + O_2(g) \rightarrow 2H_2O(g)$ d) $H^+ + e^- \rightarrow 1/2\ H_2$

17. The equivalent conductance of M/36 solution of a weak monobasic acid is 6 mho cm^2 equivalent $^{-1}$ and at infinite dilution is 400 mho cm^2 equivalent $^{-1}$. The dissociation constant of this acid is

a) 1.25×10^{-6} **b) 6.25×10^{-6}** c) 1.25×10^{-4} d) 6.25×10^{-5}

18. A conductivity cell has been calibrated with a 0.01M, 1:1 electrolytic solution (specific conductance (κ $=1.25\ 10^{-3}$ S cm) in the cell and the measured resistance was 800 Ω at 25^0C . The cell constant is,

a) 10^{-1} c m^{-1} b) 10^{1} c m^{-1} **c) 1 c m^{-1}** d) 5.7×10^{12}

19. Conductivity of a saturated solution of a sparingly soluble salt AB (1:1 electrolyte) at 298K is 1.85×10^{-5} S m^{-1} . Solubility product of the salt AB at 298K $\left(\Lambda^{\circ}_{m}\right)_{AB} = 14 \times 10^{-3}$ S m^2 mol^{-1}.

a) 5.7×10^{-12} b) 1.32×10^{-12} c) 7.5×10^{-12} **d) 1.74×10^{-12}**

20. In the electrochemical cell: Zn |$ZnSO_4$ (0.01M) | | $CuSO_4$ (1.0M) | Cu, the emf of this Daniel cell is E_1. When the concentration of is changed to 1.0M and that CuSO4 changed to 0.01M, the emf changes to E_2. From the above, which one is the relationship between E_1 and E_2?

a) $E_1 < E_2$ **b) $E_1 > E_2$** c) $E_2 \geq E_1$ d) $E_1 = E_2$

21. Consider the change in oxidation state of Bromine corresponding to different emf values as shown in the diagram below: $BrO_4^- \xrightarrow{1.82V} BrO_3^- \xrightarrow{1.5V} HBrO \xrightarrow{1.595V} Br_2 \xrightarrow{1.0652V} Br^-$

Then the species undergoing disproportionation is

a) Br_2 b) BrO_4^- c) BrO^-_3 **d) HBrO**

22. For the cell reaction $2Fe^{3+}$ (aq) + $2I^-$(aq) $\rightarrow 2Fe^{2+}$ (aq) + I_2 (aq) E^0_{cell} = 0. 24V at 298K. The standard Gibbs energy (Δ, G^o) of the cell reactions is :

a) -46.32 KJ mol^{-1} b) -23.16 KJ mol^{-1} c) 46.32 KJ mol^{-1} d) 23.16 KJ mol^{-1}

23. A certain current liberated 0.504gm of hydrogen in 2 hours. How many grams of copper can be liberated by the same current flowing for the same time through copper sulphate solution

a) 31.75 **b) 15.8** c) 7.5 d) 63.5

24. A gas X at 1 atm is bubbled through a solution containing a mixture of $1MY^-$ and $1MZ^-$ at 25°C . If the reduction potential of Z>Y>X, then

a) Y will oxidize X and not Z b) Y will oxidize Z and not X

d) Y will oxidize both X and Z d) Y will reduce both X and Z

25. Cell equation : $A + 2B^- \rightarrow A^{2+} + 2B$; $A^{2+} + 2e^- \rightarrow A$

$E^o = +0.34$ V and $\log_{10} K = 15.6$ at 300K for cell reactions find E^o for $B^+ + e^- \rightarrow B$

a) 0.80 b) 1.26 c) -0.54 d) -10.94

10. Surface Chemistry

I. Choose the correct answer:

1. For Freundlich isotherm a graph of logx/m is plotted against log p. The slope of the line and its y – axis intercept respectively corresponds to

a) 1/n, k b) log 1/n, k **c) 1/n, log k** d) log 1/n, log k

2. Which of the following is incorrect for physisorption?

a) reversible **b) increases with increase in temperature**

c) low heat of adsorption d) increases with increase in surface area

3. Which one of the following characteristics are associated with adsorption? (NEET)

a) ΔG and ΔHare negative but ΔS is positive

b) ΔGand ΔS are negative but ΔH is positive

c) ΔG is negative but ΔH and ΔS are positive

d)ΔG, ΔH and ΔS all are negative.

4. Fog is colloidal solution of

a) solid in gas b) gas in gas

c) liquid in gas d) gas in liquid

5. Assertion : Coagulation power of Al^{3+} is more than Na^+ .

Reason : greater the valency of the flocculating ion added, greater is its power to cause precipitation

a) if both assertion and reason are true and reason is the correct explanation of assertion.

b) if both assertion and reason are true but reason is not the correct explanation of assertion.

c) assertion is true but reason is false

d) both assertion and reason are false.

6. Statement :

To stop bleeding from an injury, ferric chloride can be applied. Which comment about the statement is justified?

a) It is not true, ferric chloride is a poison.

b) It is true, Fe^{3+} ions coagulate blood which is a negatively charged sol

c) It is not true; ferric chloride is ionic and gets into the blood stream.

d) It is true, coagulation takes place because of formation of negatively charged sol with Cl^-.

7. Hair cream is

a) gel **b) emulsion** c) solid sol d) sol.

8. Which one of the following is correctly matched?

a) Emulsion – Smoke

b) Gel – butter

c) foam – Mist

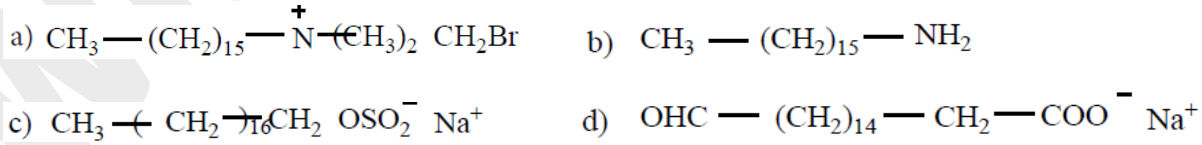
d) whipped cream – sol

9. The most effective electrolyte for the coagulation of As_2S_3 Sol is

a) NaCl b) $Ba(NO_3)_2$

c) $K_3[Fe(CN)_6]$ **d) $Al_2(SO_4)_3$**

10. Which one of the is not a surfactant? **ANSWER: B**



11. The phenomenon observed when a beam of light is passed through a colloidal solution is

a) Cataphoresis b) Electrophoresis

c) Coagulation **d) Tyndall effect**

12. In an electrical field, the particles of a colloidal system move towards cathode. The coagulation of the

same sol is studied using $K_2 SO_4$ (i), $Na_3 PO_4$ (ii),$K_4 [Fe(CN)_6]$ (iii) and NaCl (iv) Their coagulating power should be

a) II > I>IV > III **b) III > II > I > IV**

c) I > II > III > IV d) none of these

13. Collodion is a 4% solution of which one of the following compounds in alcohol – ether mixture?

a) Nitroglycerine b) Cellulose acetate

c) Glycoldinitrate **d) Nitrocellulose**

14. Which one of the following is an example for homogeneous catalysis?

a) manufacture of ammonia by Haber's process

b) manufacture of sulphuric acid by contact process

c) hydrogenation of oil

d) Hydrolysis of sucrose in presence of dil HCl

15. Match the following

A) $V_2 O_5$	i) High density polyethylene
B) Ziegler – Natta	ii) PAN
C) Peroxide	iii) NH_3
D) Finely divided Fe	iv) $H_2 SO_4$

	A	B	C	D
a)	**(iv)**	**(i)**	**(ii)**	**(iii)**
b)	(i)	(ii)	(iv)	(iii)
c)	(ii)	(iii)	(iv)	(i)
d)	(iii)	(iv)	(ii)	(i)

16. The coagulation values in millimoles per litre of the electrolytes used for the coagulation of $As_2 S_3$ are given below

(I) (NaCl)=52 (II) (($BaCl_2$)=0.69 (III) ($MgSO_4$)=0.22

The correct order of their coagulating power is

a) III > II > I b) I > II > III c) I > III > II d) II > III>I

17. Adsorption of a gas on solid metal surface is spontaneous and exothermic, then

a) ΔH increases b) ΔS increases

c) ΔG increases **d) ΔS decreases**

18. If x is the amount of adsorbate and m is the amount of adsorbent, which of the following relations is not related to adsorption process?

a) x/m=f(P) at constant T b) x/m=f(T) at constant P

c) P = f(T) at constant x/m **d) x/m= PT**

19. On which of the following properties does the coagulating power of an ion depend ?

a) Both magnitude and sign of the charge on the ion.

b) Size of the ion alone

c) the magnitude of the charge on the ion alone

d) the sign of charge on the ion alone.

20. Match the following

A) Pure nitrogen	i) Chlorine
B) Haber process	ii) Sulphuric acid
C) Contact process	iii) Ammonia
D) Deacons Process	iv) sodium azide (or) Barium azide

Which of the following is the correct option?

	A	B	C	D
a)	(i)	(ii)	(iii)	(iv)
b)	(ii)	(iv)	(i)	(iii)
c)	(iii)	(iv)	(ii)	(i)
d)	**(iv)**	**(iii)**	**(ii)**	**(i)**

I. Choose the correct answer

1. An alcohol (x) gives blue colour in Victormeyer's test and 3.7g of X when treated with metallic sodium liberates 560 mL of hydrogen at 273 K and 1 atm pressure what will be the possible structure of X?

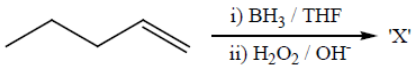
a) CH_3 CH (OH) CH_2 CH_3 b) CH_3 – CH (OH) – CH_3

b) CH_3 C (OH) $(CH_3)_2$ d) CH_3- CH_2 –CH (OH) – CH_2 – CH_3

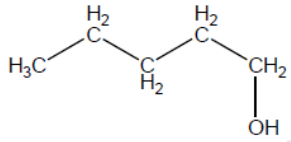
2. Which of the following compounds on reaction with methyl magnesium bromide will give tertiary alcohol.

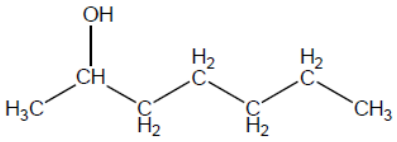
a) benzaldehyde b) propanoic acid

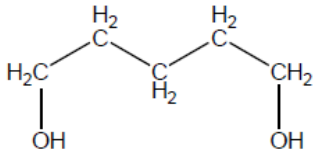
c) methyl propanoate d) acetaldehyde

3. 

The X is **ANSWER: A**

a) 

b) 

c) 

d) None of these

4. In the reaction sequence, Ethene $\xrightarrow{HOCl}$ ∀ $\xrightarrow{X}$ ethan -1, 2 - diol . A and X respectively are

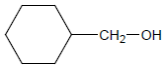
a) Chloroethane and NaOH b) ethanol and H_2SO_4

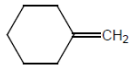
c) 2 – chloroethan -1-ol and $NaHCO_3$ d) ethanol and H_2O

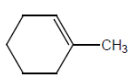
5. Which one of the following is the strongest acid

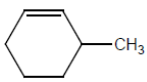
a) 2 - nitrophenol b) 4 – chlorophenol

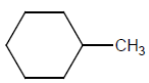
c) 4 – nitrophenol d) 3 – nitrophenol

6. 
on treatment with Con H_2SO_4, predominately gives **ANSWER: B**

a) 

b) 

c) 

d) 

7. Carbolic acid is

a) Phenol b) Picric acid

d) benzoic acid d) phenylacetic acid

8. Which one of the following will react with phenol to give salicyladehyde after hydrolysis.

a) Dichloro methane b) trichloroethane

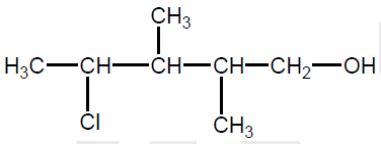
c) trichloro methane d) CO_2

9. $(CH_3)_3$ - C - CH(OH) CH_3 $\xrightarrow{\text{Con } H_2SO_4}$ X (major product)

a) $(CH_3)_3$ CCH = CH_2 b) $(CH_3)_2$ C = C $(CH_3)_2$

c) CH_2 = $C(CH_3)CH_2 - CH_2 - CH_3$ d) CH_2 = $C(CH_3) - CH_2 - CH_2 - CH_3$

10. The correct IUPAC name of the compound,



a) 4 – chloro – 2,3 – dimethyl pentan – 1-ol b) 2,3 – dimethyl – 4- chloropentan -1-ol

c) 2,3,4 – trimethyl – 4- chlorobutan -1-ol d) 4 – chloro – 2,3,4 – trimethyl pentan – 1-ol

11. Assertion : Phenol is more acidic than ethanol

Reason: Phenoxide ion is resonance stabilized

a) if both assertion and reason are true and reason is the correct explanation of assertion.

b) if both assertion and reason are true but reason is not the correct explanation of assertion.

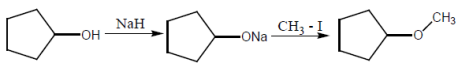
c) assertion is true but reason is false

d) both assertion and reason are false.

12. In the reaction $\text{Ethanol} \xrightarrow{PCl_5} X \xrightarrow{\text{alc.KOH}} Y \xrightarrow[298K]{H_2SO_4/H_2O} Z.$ The 'Z' is

a) ethane **b) ethoxyethane**

c) ethylbisulphite d) ethanol

13. The reaction 

Can be classified as

a) dehydration b) Williamson alcoholsynthesis

c) Williamson ether synthesis d) dehydrogenation of alcohol

14. Isopropylbenzene on air oxidation in the presence of dilute acid gives

a) C_6H_5COOH b) $C_6 H_5 COCH_3$

c) $C_6H_5C\ C_6H_5$ **d) C_6H_5-OH**

15. Assertion : Phenol is more reactive than benzene towards electrophilic substitution reaction

Reason : In the case of phenol, the intermediate arenium ion is more stabilized by resonance.

a) if both assertion and reason are true and reason is the correct explanation of assertion.

b) if both assertion and reason are true but reason is not the correct explanation of assertion.

c) assertion is true but reason is false

d) both assertion and reason are false.

16. HO CH_2 CH_2 – OH on heating with periodic acid gives

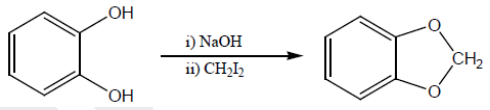
a) methanoic acid b) Glyoxal **c) methanal** d) CO_2

17. Which of the following compound can be used as artifreeze in automobile radiators?

a) methanol b) ethanol

c) Neopentyl alcohol **d) ethan -1, 2-diol**

18. The reactions



is an example of

a) Wurtz reaction b) cyclic reaction

c) Williamson reaction d) Kolbe reactions

19. One mole of an organic compound (A) with the formula C_3 H_8 O reacts completely with two moles of HI to form X and Y. When Y is boiled with aqueous alkali it forms Z. Z answers the iodoform test. The compound (A) is

a) propan – 2-ol b) propan -1-ol

c) ethoxy ethane **d) methoxy ehane**

20. Among the following ethers which one will produce methyl alcohol on treatment with hot HI?

a) $(H_3C)_3C-O-CH_3$ b) $(CH_3)_2-CH-CH_2-O-CH_3$

c) $CH_3(CH_2)_3-O-CH_3$ d) $CH_3-CH_2-\underset{\displaystyle CH_3}{\underset{|}{CH}}-O-CH_3$

ANSWER: A

21. Williamson synthesis of preparing dimethyl ether is a / an /

a) SN^1 reactions **b) SN^2 reaction**

c) electrophilic addition d) electrophilic substitution

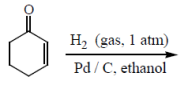
22. On reacting with neutral ferric chloride, phenol gives

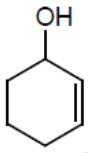
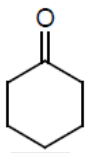
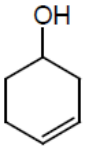
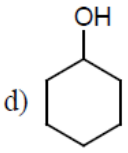
a) red colour **b) violet colour**

c) dark green colour d) no colouration.

12. Carbonyl Compounds And Carboxylic Acids

I. Choose the correct answer:

1. The correct structure of the product 'A' formed in the reaction  A is

a)  b)  c)  d) 

ANSWER: B

2. The formation of cyanohydrin from acetone is an example of

a) nucleophilic substitution b) electrophilic substitution

c) electrophilic addition **d) Nucleophilic addition**

3. Reaction of acetone with one of the following reagents involves nucleophilic addition followed by elimination of water. The reagent is

a) Grignard reagent b) Sn / HCl

c) hydrazine in presence of slightly acidic solution d) hydrocyanic acid

4. In the following reaction, $HC\equiv CH \xrightarrow[HgSO_4]{H_2SO_4} X$ Product 'X' will not give

a) Tollen's test **b) Victor meyer test**

c) Iodoform test d) Fehling solution test

5. $CH_2{=}CH_2 \xrightarrow[ii)\ Zn/H_2O]{i)\ O_3} X \xrightarrow{NH_3} Y$ 'Y' is

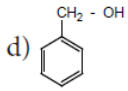
a) Formaldelyde b) di acetone ammonia

c) hexamethylene tetraamine d) oxime

6. Predict the product Z in the following series of reactions

$$\text{Ethanoic acid} \xrightarrow{PCl_5} X \xrightarrow[Anhydrous AlCl_3]{C_6H_6} Y \xrightarrow[ii)H_3O^+]{i)CH_3MgBr} Z\,.$$

a) $(CH_3)_2\ C(OH)C_6\ H_5$ b) $CH_3CH(OH)C_6\ H_5$

c) $CH_3\ CH(OH)CH_2 - CH_3$ d) 

7. Assertion: 2,2 – dimethyl propanoic acid does not give HVZ reaction.

Reason: 2 – 2, dimethyl propanoic acid does not have α - hydrogen atom

a) if both assertion and reason are true and reason is the correct explanation of assertion.

b) if both assertion and reason are true but reason is not the correct explanation of assertion.

c) assertion is true but reason is false

d) both assertion and reason are false.

8. Which of the following represents the correct order of acidity in the given compounds

a)$FCH_2\ COOH > CH_3\ COOH > BrCH_2\ COOH > ClCH_2\ COOH$

b) $FCH_2\ COOH > ClCH_2\ COOH > BrCH_2\ COOH > CH_3\ COOH$

c) $CH_3\ COOH > ClCH_2\ COOH > FCH_2\ COOH > BrCH_2\ COOH$

d) $ClCH_2\ COOH > CH_3\ COOH > BrCH_2\ COOH > ICH_2\ COOH$

9. Benzoic acid $\xrightarrow[ii)\ \Delta]{i)\ NH_3} A \xrightarrow{NaOBr} B \xrightarrow{NaNO_2/HCl} C$ 'C' is

a) anilinium chloride b) O – nitro aniline

c) benzene diazonium chloride d) m – nitro benzoic acid

10. Ethanoic acid $\xrightarrow{P/Br_2}$ 2 – bromoethanoic acid. This reaction is called

a) Finkelstein reaction b) Haloform reaction

c) Hell – Volhard – Zelinsky reaction d) none of these

11. $CH_3Br \xrightarrow{KCN} (A) \xrightarrow{H_2O^+} (B) \xrightarrow{PCl_5} (C)$ product (c) is

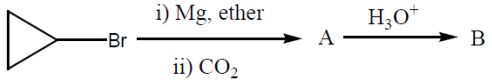
a) acetylchloride b) chloro acetic acid

c) α- chlorocyano ethanoic acid d) none of these

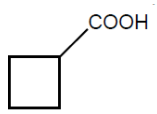
12. Which one of the following reduces tollens reagent

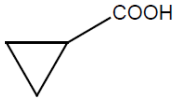
a) formic acid b) acetic acid

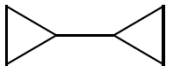
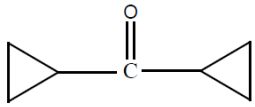
c) benzophenone d) none of these

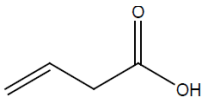
13. 

'B' is **ANSWER: B**

a) 

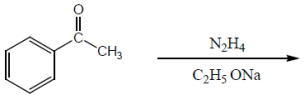
b) 

c) 
d) 

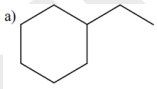
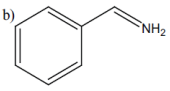
14. The IUPAC name of 

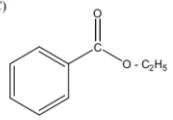
a) but – 3- enoicacid b) but – 1- ene-4-oicacid

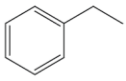
c) but – 2- ene-1-oic acid d) but -3-ene-1-oicacid

15. Identify the product formed in the reaction 

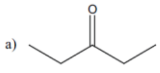
ANSWER: D

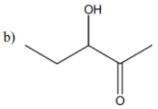
a) 
b) 

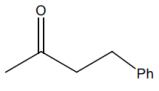
C) 

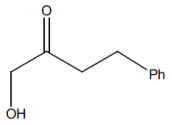
d) 

16. In which case chiral carbon is not generated by reaction with HCN **ANSWER: A**

a) 

b) 

C) 

d) 

17. Assertion : p – N, N – dimethyl aminobenzaldehyde undergoes benzoin condensation

Reason : The aldehydic (-CHO) group is meta directing

a) if both assertion and reason are true and reason is the correct explanation of assertion.

b) if both assertion and reason are true but reason is not the correct explanation of assertion.

c) assertion is true but reason is false

d) both assertion and reason are false.

18. Which one of the following reaction is an example of disproportionation reaction

a) Aldol condensation **b) cannizaro reaction**

c) Benzoin condensation d) none of these

19. Which one of the following undergoes reaction with 50% sodium hydroxide solution to give the corresponding alcohol and acid

a) Phenylmethanal b) ethanal

c) ethanol d) methanol

20. The reagent used to distinguish between acetaldehyde and benzaldehyde is

a) Tollens reagent **b) Fehling's solution**

c) 2,4 – dinitrophenyl hydrazine d) semicarbazide

21. Phenyl methanal is reacted with concentrated NaOH to give two products X and Y. X reacts with metallic sodium to liberate hydrogen X and Y are

a) sodiumbenzoate and phenol b) Sodium benzoate and phenyl methanol

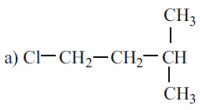
c) phenyl methanol and sodium benzoate d) none of these

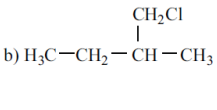
22. In which of the following reactions new carbon – carbon bond is not formed?

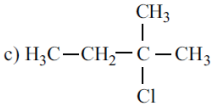
a) Aldol condensation b) Friedel craft reaction

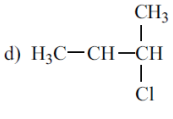
c) Kolbe's reaction **d) Wolf kishner reduction**

23. An alkene "A" on reaction with O3 and Zn - H O 2 gives propanone and ethanol in equimolar ratio. Addition of HCl to alkene "A" gives "B" as the major product. The structure of product "B" is **ANSWER: C**









24. Carboxylic acids have higher boiling points than aldehydes, ketones and even alcohols of comparable

molecular mass. It is due to their

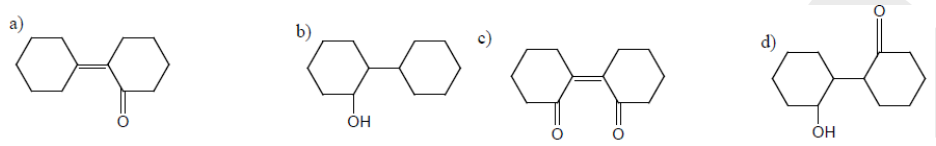
a) more extensive association of carboxylic acid via van der Waals force of attraction

b) formation of carboxylate ion

c) formation of intramolecular H-bonding

d) formation of intermolecular H – bonding

25. Of the following, which is the product formed when cyclohexanone undergoes aldol condensation followed by heating? **ANSWER: A**



13. Organic Nitrogen Compounds

I. Choose the correct answer:

1. Which of the following reagent can be used to convert nitrobenzene to aniline

a) Sn / HCl b) ZnHg / NaOH

c) LiAlH4 d) All of these

2. The method by which aniline cannot be prepared is

a) degradation of benzamide with Br_2 / NaOH

b) potassium salt of phthalimide treated with chlorobenzene followed by hydrolysis with aqueous NaOH solution.

c) Hydrolysis of phenylcyanide with acidic solution

d) reduction of nitrobenzene by Sn / HCl .

3. Which one of the following will not undergo Hofmann bromamide reaction

a) CH_3 CONHCH$_3$ b) CH_3 CH_2 $CONH_2$

c) CH_3 $CONH_2$ d) C_6 H_5 $CONH_2$

4. Assertion : Acetamide on reaction with KOH and bromine gives acetic acid

Reason : Bromine catalyses hydrolysis of acetamide.

a) if both assertion and reason are true and reason is the correct explanation of assertion.

b) if both assertion and reason are true but reason is not the correct explanation of assertion.

c) assertion is true but reason is false

d) both assertion and reason are false.

5. $CH_3CH_2Br \xrightarrow[\Delta]{\text{aq NaOH}} A \xrightarrow[\Delta]{KMnO_4/H^+} B \xrightarrow[\Delta]{NH_3} C \xrightarrow{Br_2/NaOH} D$ 'D' is

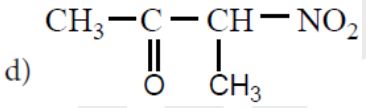
a) bromomethane b) α - bromo sodium acetate

c) methanamine d) acetamide

6. Which one of the following nitro compounds does not react with nitrous acid

a) $CH_3 - CH_2 - CH_2 - NO_2$ b) $(CH_3)_2 CH - CH_2 NO_2$

c) $(CH_3)_3 C NO_2$

d) 

7. Aniline + benzoylchloride $\xrightarrow{NaOH}$ $C_6H_5 - NH - COC_6H_5$ this reaction is known as

a) Friedel – crafts reaction b) HVZ reaction

c) Schotten – Baumann reaction d) none of these

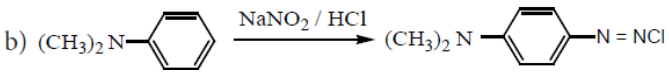
8. The product formed by the reaction an aldehyde with a primary amine

a) carboxylic acid b) aromatic acid

c) schiff 's base d) ketone

9. Which of the following reaction is not correct. **ANSWER: B**

a) $CH_3 CH_2 NH_2 \xrightarrow{HNO_2} CH_3 CH_2 OH + N_2$

b) 

c) $CH_3 CONH_2 \xrightarrow{Br_2/NaOH} CH_3 NH_2$ d) none of these

10. When aniline reacts with acetic anhydride the product formed is

a) o – aminoacetophenone b) m-aminoacetophenone

c) p – aminoacetophenone **d) acetanilide**

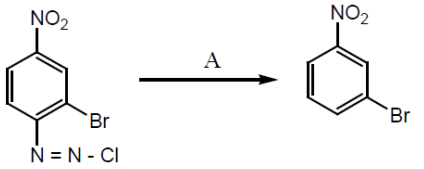
11. The order of basic strength for methyl substituted amines in aqueous solution is

a) $N(CH_3)_3 > N(CH_3)_2H > N(CH_3)H_2 > NH_3$

b) $N(CH_3)_2H > N(CH_3)_2H > N(CH_3)_3 > NH_3$

c) $NH_3 > N(CH_3)H_2 > N(CH_3)_2H > N(CH_3)_3$

d) $N(CH_3)_2H > N(CH_3)H_2 > N(CH_3)_3 > NH_3$

12. 

'A' is

a) H_3PO_2 and H_2O b) H^+ / H_2O

c) $HgSO_4 / H_2SO_4$ d) Cu_2Cl_2

13. $C_6H_5NO_2 \xrightarrow{Fe/Hcl} A \xrightarrow[273K]{NaNO_2/HCl} B \xrightarrow[283K]{H_2O} C$ 'C' is

a) C_6H_5 - OH b) $C_6H_5 - CH_2OH$

c) C_6H_5 - CHO d) $C_6H_5NH_2$

14. Nitrobenzene on reaction with Con HNO_3 / H_2SO_4 at 80-100° C forms which one of the following products?

a) 1,4 – dinitrobenzene b) 2,4,6 – tirnitrobenzene

c) 1,2 – dinitrobenzene **d) 1,3 – dinitrobenzene**

15. $C_5H_{13}N$ reacts with HNO_2 to give an optically active compound – The compound is

a) pentan – 1- amine **b) pentan – 2- amine**

c) N,N – dimethylpropan -2-amine d) N – methylbutan – 2-amine

16. Secondary nitro alkanes react with nitrous acid to form

a) red solution **b) blue solution**

c) green solution d) yellow solution

17. Which of the following amines does not undergo acetylation?

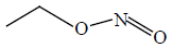
a) t – butylamine b) ethylamine

c) diethylamine **d) triethylamine**

18. Which one of the following is most basic?

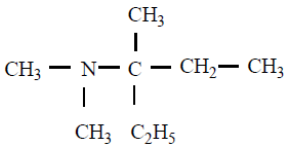
a) 2,4 – dichloroaniline **b) 2,4 – dimethyl aniline**

c) 2,4 – dinitroaniline d) 2,4 – dibromoaniline

19. When  is reduced with Sn / HCl the pair of compounds formed are

a) Ethanol, hydroxylamine hydrochloride b) Ethanol, ammonium hydroxide

c) Ethanol, $.NH_2$ OH d) C_3 H_5 NH_2 , H_2O

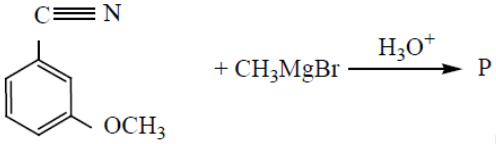
20. IUPAC name for the amine  is

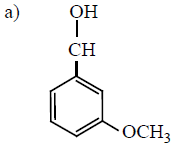
a) 3 – Bimethylamino – 3 – methyl pentane

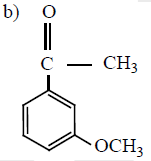
b) 3 (N,N – Triethyl) – 3- amino pentane

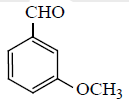
c) 3 – N,N – trimethyl pentanamine

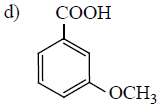
d) 3 – (N,N – Dimethyl amino) – 3- methyl pentane

21.  Product 'P' in the above reaction is **ANSWER: B**

a) 

b) 

c) 

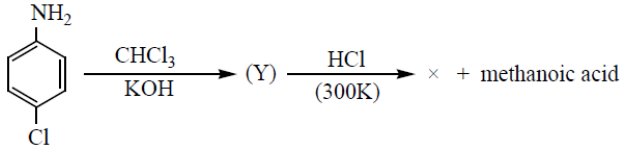
d) 

22. Ammonium salt of benzoic acid is heated strongly with P_2O_5 and the product so formed is reduced and then treated with $NaNO_2$ / HCl at low temperature. The final compound formed is

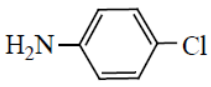
a) Benzene diazonium chloride **b) Benzyl alcohol**

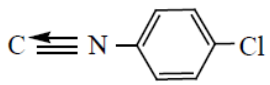
c) Phenol d) Nitrosobenzene

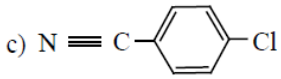
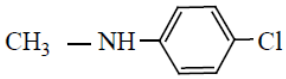
23. Identify X in the sequence give below.



ANSWER: A

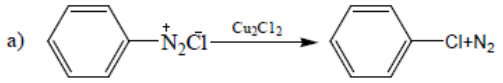
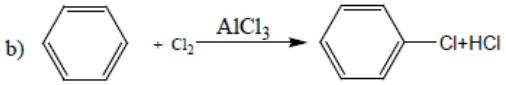
a) 

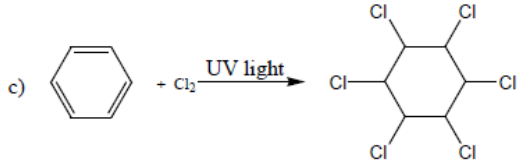
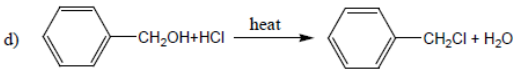
b) 

c)  d) 

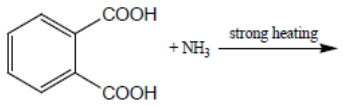
24. Among the following, the reaction that proceeds through an electrophilic substitution, is :

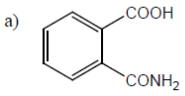
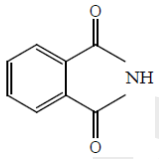
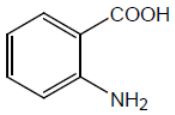
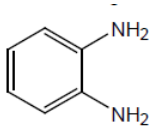
ANSWER: B

a)  b) 

c)  d) 

25. The major product of the following reaction **ANSWER: B**



a)  b)  c)  d) 

14. Biomolecules

I. Choose the Correct Answer:

1. Which one of the following rotates the plane polarized light towards left?

(a) D(+) Glucose (b) L(+) Glucose

(c) D(-) Fructose (d) D(+) Galactose

2. The correct corresponding order of names of four aldoses with configuration given below Respectively is,

a) L-Erythrose, L-Threose, L-Erythrose, D-Threose

b) D-Threose,D-Erythrose, L-Threose, L-Erythrose,

c) L-Erythrose, L-Threose, D-Erythrose, D-Threose

d) D-Erythrose, D-Threose, L-Erythrose, L-Threose

3. Which one given below is a non-reducing sugar?

a) Glucose **b) Sucrose**

c) maltose d) Lactose

4. Glucose(HCN) Product (hydrolysis) Product (HI + Heat) A, the compound A is

a) Heptanoic acid b) 2-Iodohexane

c) Heptane d) Heptanol

5. Assertion: A solution of sucrose in water is dextrorotatory. But on hydrolysis in the presence of little hydrochloric acid, it becomes levorotatory.

Reason: Sucrose hydrolysis gives unequal amounts of glucose and fructose. As a result of this change in sign of rotation is observed.

a) If both accretion and reason are true and reason is the correct explanation of assertion

b) If both assertion and reason are true but reason is not the correct explanation of assertion

c) If assertion is true but reason is false.

d) if both assertion and reason are false.

6. The central dogma of molecular genetics states that the genetic information flows from

a) Amino acids Protein DNA

b) DNA Carbohydrates Proteins

c) DNA **RNA** **Proteins**

d) DNA RNA Carbohydrates

7. In a protein, various amino acids liked together by

a) Peptide bond b) Dative bond

c) α - Glycosidic bond d) β - Glycosidic bond

8. Among the following the achiral amino acid is

a) 2-ethylalanine b) 2-methylglycine

c) 2-hydroxymethylserine d) Tryptophan

9. The correct statement regarding RNA and DNA respectively is

a) the sugar component in RNA is an arabinos and the sugar component in DNA is ribose

b) the sugar component in RNA is 2'-deoxyribose and the sugar component in DNA is arabinose

c) the sugar component in RNA is an arabinose and the sugar component in DNA is 2'-deoxyribose

d) the sugar component in RNA is ribose and the sugar component in DNA is 2'-deoxyribose

10. In aqueous solution of amino acids mostly exists in,

a) NH_2-CH(R)-COOH b) NH_2-CH(R)-COO

c) H_3N^+-CH(R)-COOH **d) H_3N^+-CH(R)-COO^-**

11. Which one of the following is not produced by body?

a) DNA b) Enzymes

c) Harmones **d) Vitamins**

12. The number of sp2 and sp3 hybridised carbon in fructose are respectively

a) 1 and 4 b) 4 and 2

c) 5 and 1 **d) 1 and 5**

13. Vitamin B2 is also known as

a) Riboflavin b) Thiamine

c) Nicotinamide d) Pyridoxine

14. The pyrimidine bases present in DNA are

a) Cytosine and Adenine b) Cytosine and Guanine

c) Cytosine and Thiamine d) Cytosine and Uracil

15. Among the following L-serine is **ANSWER: C**

16. The secondary structure of a protein refers to

a) fixed configuration of the polypeptide backbone

b) hydrophobic interaction

c) sequence of α-amino acids

d) α-helical backbone.

17. Which of the following vitamins is water soluble?

a) Vitamin E **b) Vitamin K**

c) Vitamin A d) Vitamin B

18. Complete hydrolysis of cellulose gives

a) L-Glucose b) D-Fructose

c) D-Ribose **d) D-Glucose**

19. Which of the following statement is correct?

a) Ovalbumin is a simple food reserve in egg-white

b) Blood proteins thrombin and fibrinogen are involved in blood clotting

c) Denaturation makes protein more active

d) Insulin maintains the sugar level of in the human body.

20. Glucose is an aldose. Which one of the following reactions is not expected with glucose?

a) It does not form oxime **b) It does not react with Grignard reagent**

c) It does not form osazones d) It does not reduce tollens reagent

21. If one strand of the DNA has the sequence 'ATGCTTGA', then the sequence of complementary strand would be

a) TACGAACT b) TCCGAACT

c) TACGTACT d) TACGRAGT

22. Insulin, a hormone chemically is

a) Fat b) Steroid

c) Protein d) Carbohydrates

23. α -D (+) Glucose and β-D (+) glucose are

a) Epimers **b) Anomers**

c) Enantiomers d) Conformational isomers

24. Which of the following are epimers

a) D(+)-Glucose and D(+)-Galactose (b) D(+)-Glucose and D(+)-Mannose

c) Neither (a) nor (b) **(d) Both (a) and (b)**

25. Which of the following amino acids are achiral?

a) Alanine b) Leucine

c) Proline **d) Glycine**

15. Chemistry In Everyday Life

I. Choose the Correct Answer:

1. Which of the following is an analgesic?

a) Streptomycin b) Chloromycetin

c) Asprin d) Penicillin

2. Dettol is the mixture of

a) Chloroxylenol and bithionol **b) Chloroxylenol and α-terpineol**

c) phenol and iodine d) terpineol and bithionol

3. Antiseptics and disinfectants either kill or prevent growth of microorganisms. Identify which of the following statement is not true.

a) dilute solutions of boric acid and hydrogen peroxide are strong antiseptics.

b) Disinfectants harm the living tissues.

c) A 0.2% solution of phenol is an antiseptic while 1% solution acts as a disinfectant.

d) Chlorine and iodine are used as strong disinfectants.

4. Saccharin, an artificial sweetener is manufactured from

a) cellulose **b) toluene**

b) cyclohexene d) starch

5. Drugs that bind to the receptor site and inhibit its natural function are called

a) antagonists b) agonists

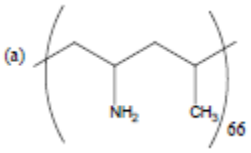
c) enzymes d) molecular targets

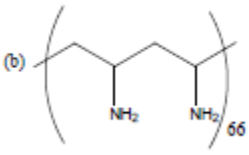
6. Aspirin is a/an

a) acetylsalicylic acid b) benzoyl salicylic acid

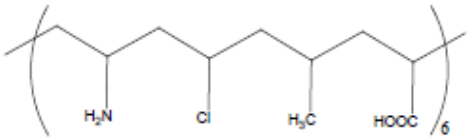
c) chlorobenzoic acid d) anthranilic acid

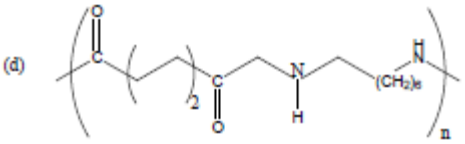
7. Which one of the following structures represents nylon 6,6 polymer?

(a) 

(b) 

ANSWER: D

(c) 

(d) 

8. Natural rubber has

a) alternate cis- and trans-configuration b) random cis- and trans-configuration

c) all cis-configuration d) all trans-configuration

9. Nylon is an example of

a) polyamide b) polythene

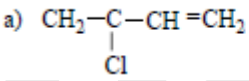
c) polyester d) poly saccharide

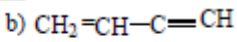
10. Terylene is an example of

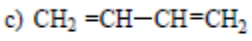
a) polyamide b) polythene

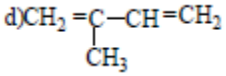
c) polyester d) polysaccharide

11. Which is the monomer of neoprene in the following? **ANSWER: A**

a) 

b) 

c) 

d) 

12. Which one of the following is a bio-degradable polymer?

a) HDPE b) PVC c) Nylon 6 **d) PHBV**

13. Non stick cook wares generally have a coating of a polymer, whose monomer is

a) ethane b) prop-2-enenitrile

c) chloroethene **d) 1,1,2,2-tetrafluoroethane**

14. Assertion: 2-methyl-1,3-butadiene is the monomer of natural rubber

Reason: Natural rubber is formed through anionic addition polymerisation.

a) If both assertion and reason are true and reason is the correct explanation of assertion.

b) if both assertion and reason are true but reason is not the correct explanation of assertion.

c) assertion is true but reason is false.

d) both assertion and reason are false.

15. An example of antifertility drug is

a) novestrol b) seldane

c) salvarsan d) Chloramphenicol

16. The drug used to induce sleep is

a) paracetamol b) bithional

c) chloroquine **d) equanil**

17. Which of the following is a co-polymer?

a) Orlon b) PVC

c) Teflon **d) PHBV**

18. The polymer used in making blankets (artificial wool) is

a) polystyrene **b) PAN**

c) polyester d) polythene

19. Regarding cross-linked or network polymers, which of the following statement is incorrect?

a) Examples are Bakelite and melamine

b) They are formed from bi and tri-functional monomers

c) They contain covalent bonds between various linear polymer chains

d) They contain strong covalent bonds in their polymer chain

20. A mixture of chloroxylenol and terpinecol acts as

a) antiseptic b) antipyretic

c) antibiotic d) analgesic