

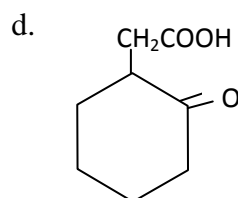
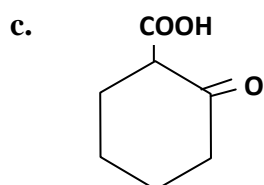
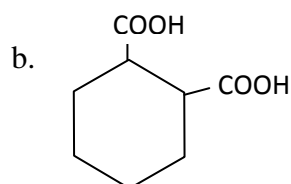
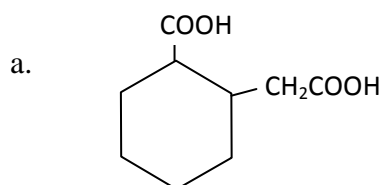
CHEMISTRY – 1 Key Answers *

*Key Answers are given in **BOLD** font.

- Which of the following behaves as both oxidising and reducing agent
 - H_2SO_4
 - SO_2**
 - H_2S
 - HNO_3
- The work function of a metal is 4.2 eV, if the radiation of 2000 \AA falls on the metal then the kinetic energy of the fastest photo electron is
 - $1.6 \times 10^{-19} \text{ J}$
 - $16 \times 10^{10} \text{ J}$
 - $3.2 \times 10^{-19} \text{ J}$**
 - $6.4 \times 10^{10} \text{ J}$
- Consider the following reaction
$$\text{C}_6\text{H}_5\text{NO}_2 \xrightarrow{\text{Sn/HCl}} \text{x} \xrightarrow{\text{C}_6\text{H}_5\text{COCl}} \text{Y} + \text{HCl. What is Y?}$$
 - Acetanilide
 - Benzanilide**
 - Azobenzene
 - Hydrazobenzene
- The correct order of magnetic moments (spin value in B.M.) among the following is
 - $[\text{MnCl}_4]^{-2} > [\text{CoCl}_4]^{-2} > [\text{Fe}(\text{CN})_6]^{-4}$**
 - $[\text{Fe}(\text{CN})_6]^{-4} > [\text{CoCl}_4]^{-2} > [\text{MnCl}_4]^{-2}$
 - $[\text{Fe}(\text{CN})_6]^{-4} > [\text{MnCl}_4]^{-2} > [\text{CoCl}_4]^{-2}$
 - $[\text{MnCl}_4]^{-2} > [\text{Fe}(\text{CN})_6]^{-4} > [\text{CoCl}_4]^{-2}$
- In Freundlich adsorption isotherm the value of $1/n$ is
 - between 0 & 1 in all cases**
 - between 2 & 4 in all cases
 - 1 in case of Physical adsorption
 - 1 in case of chemical adsorption
- The correct order of stability of H_2 , Li_2 , B_2 is
 - $\text{Li}_2 > \text{B}_2 > \text{H}_2$
 - $\text{H}_2 > \text{B}_2 > \text{Li}_2$**
 - $\text{B}_2 > \text{Li}_2 > \text{H}_2$
 - All have equal stability

7. The ionisation potential for hydrogen atom is 13.6 eV. The ionisation potential for He^+ is
- 54.4 eV**
 - 6.8 eV
 - 13.6 eV
 - 24.5 eV

8. The compound that undergoes decarboxylation most readily under mild conditions is



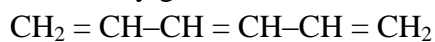
9. IUPAC name of the compound $\text{K}_3[\text{Fe}(\text{CN})_5\text{CO}]$ is

- Potassium carbonyl pentacyano ferrate (II)**
- Potassium pentacyano carbonyl ferrate (II)
- Potassium carbonyl pentacyano ferrate (III)
- Potassium pentacyano carbonyl ferrate (III)

10. In the reversible $2\text{NO}_2 \xrightleftharpoons[\text{K}_2]{\text{K}_1} \text{N}_2\text{O}_4$ reaction, the rate of disappearance of NO_2 is equal to

- $\frac{2\text{K}_1}{\text{K}_2} [\text{NO}_2]^2$
- $2\text{K}_1 [\text{NO}_2]^2 - 2\text{K}_2 [\text{N}_2\text{O}_4]$
- $2\text{K}_1 [\text{NO}_2]^2 - \text{K}_2 [\text{N}_2\text{O}_4]$
- $(2\text{K}_1 - \text{K}_2) [\text{NO}_2]$

11. How many geometrical isomers are possible for the following compound



- 2**
- 4
- 6
- 8

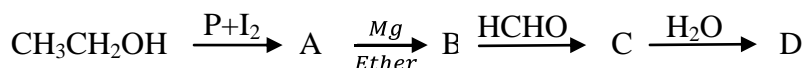
12. The system $\text{PCl}_5(\text{g}) \rightleftharpoons \text{PCl}_3(\text{g}) + \text{Cl}_2(\text{g})$ attain equilibrium. If the equilibrium concentration of $\text{PCl}_3(\text{g})$ is doubled, the concentration of $\text{Cl}_2(\text{g})$ would become
- 1/4 of its initial value
 - 1/2 of its initial value**
 - Twice of its initial value
 - None of the above
13. Which of the following antacids is an antihistamine
- Ranitidine**
 - Lansoprazole
 - Terfenadine
 - Luminol
14. Which of the following on hydrolysis with dilute alkali followed by acidification gives benzoic acid.
- Benzotrichloride**
 - Benzalchloride
 - Benzyl chloride
 - P-chlorotoluene
15. The number of lone pair of electrons on Xe atoms in XeF_2 , XeF_4 & XeF_6 molecules are respectively
- 3,2 and 1**
 - 4,3 & 2
 - 2,3 & 1
 - 3,2 & 0
16. Which of the following is a primary pollutant
- CO**
 - DAN
 - Aldehydes
 - H_2SO_4
17. For the reaction $\text{SnO}_2(\text{s}) + 2\text{H}_2(\text{g}) \longrightarrow 2\text{H}_2\text{O}(\text{g}) + \text{Sn}(\text{l})$ at 900 K the equilibrium steam Hydrogen mixture was found to be 40% H_2 by volume the K_p is
- 1.15
 - 2.25**

- c. 7.5
- d. 10

18. Glyptal polymer is obtained from glycerol by reacting with

- a. Molanic acid
- b. Phthalic acid**
- c. Maleic acid
- d. Acetic acid

19. In the following sequence of reactions compound 'D' is



- a. Propanal
- b. Butanal
- c. N-butyl alcohol
- d. N-propyl alcohol**

20. In which of the following molecules/ions all the bonds are not equal

- a. XeF₄
- b. BF₄
- c. SF₄**
- d. SiF₄

21. H₂O₂ can not oxidise

- a. PbS_(s)
- b. O_{3(g)}**
- c. Na₂SO_{3(aq)}
- d. KI_(aq)

22. The relative basic character of the following is

- a. ClO⁻ < ClO₂⁻ < ClO₃⁻ < ClO₄⁻
- b. ClO₄⁻ < ClO₃⁻ < ClO₂⁻ < ClO⁻**
- c. ClO₃⁻ < ClO₄⁻ < ClO₂⁻ < ClO⁻
- d. ClO₂⁻ < ClO⁻ < ClO₃⁻ < ClO₄⁻

23. Phenol is heated with a solution of a mixture of KBr and KBrO₃. The major product obtained in the above reaction is

- a. 3-bromophenol
- b. 4-bromophenol
- c. 2,4,6-tribromophenol**
- d. 2-bromophenol

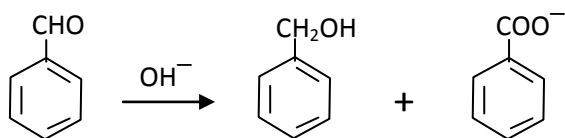
24. The number of disulphide linkage present in insulin is
 a. **3**
 b. 4
 c. 1
 d. 2
25. 32 g of CaC_2 reacts at 27°C with excess of water to produce acetylene gas. The work done will be
 a. **-300 cal**
 b. -300 J
 c. -2400 cal
 d. -2400 J
26. Which of the following bicarbonates does not exist as solid?
 a. KHCO_3 b. NaHCO_3 c. $\text{C}_6\text{H}_5\text{HCO}_3$ **d. LiHCO_3**
27. Phosphorous compound used in Holme's signals is
 a. PCl_3 **b. Ca_3P_2** c. P_2O_5 d. P_2O_3
28. In the following reaction

$$\text{C}_2\text{H}_5 - \text{O} - \text{C}_2\text{H}_5 \xrightarrow{\text{Red P} + \text{HI}} 2\text{X} + \text{H}_2\text{O}, \text{X is}$$
 a. **Ethane**
 b. Ethylene
 c. Butane
 d. Propane
29. Which of the following polymer do not involve cross linkages
 a. Melmac
 b. Bakelite
c. Polyethylene
 d. Vulcanised rubber
30. A reaction is spontaneous at low temperature but non-spontaneous at high temperature which of the following is true for this reaction.
 a. $\Delta\text{H} > 0, \Delta\text{S} > 0$
b. $\Delta\text{H} < 0, \Delta\text{S} < 0$
 c. $\Delta\text{H} > 0, \Delta\text{S} = 0$
 d. $\Delta\text{H} < 0, \Delta\text{S} > 0$

31. Among the elements of group 14 reducing power of the divalent species decreases in the order
- Ge > Sn > Pb**
 - Sn > Ge > Pb
 - Pb > Sn > Ge
 - Sn > Pb > Ge
32. Lithium metal crystallises in a body center cubic crystal. If the length of the side of the unit cell of lithium is 351 pm. The atomic radius of lithium will be
- 151.8 pm**
 - 75.5 pm
 - 300.5 pm
 - 240.8 pm
33. Zinc is white cold and yellow when heated. It is due to the development of
- Frenkel defect
 - Schottky defect
 - Metal excess defect**
 - Metal deficiency defect
34. Which of the following are the correct axial distances and axial angles for rhombohedral system
- a=b=c $\alpha=\beta=\delta \neq 90^\circ$**
 - a=b≠c $\alpha=\beta=\delta = 90^\circ$
 - a≠b=c $\alpha=\beta=\delta = 90^\circ$
 - a≠b≠c $\alpha\neq\beta\neq\delta = 90^\circ$
35. Henry's law constant for the solubility of N₂ gas in water at 298 K is 1x10⁵ atm. The number of moles of N₂ from air dissolved in 10 moles of water at 298 K and 5 atm. Pressure is
- 4 x 10⁻⁴**
 - 4 x 10⁻¹⁵
 - 5 x 10⁻⁴
 - 4 x 10⁻⁶
36. 0.2 mole HCl and 0.1 mole pf CaCl₂ were dissolved in water to have 500 ml of solution. The molarity of Cl⁻ ions in the solution is
- 0.04 m
 - 0.80 m**
 - 0.40 m
 - 0.08 m

37. A solution of A and B with 0.2 mole fraction of A found to have total vapour pressure of 125 mm. Pure a & B have vapour pressure 100 mm & 150 mm respectively will it show
- +ve deviation
 - ve deviation**
 - No deviation
 - Anything can happen
38. The hydrogen electrode is dipped in a solution of Ph=3 at 25 degree Centigrade. The potential of the cell would be, ($2.3036 RT/F = 0.059v$)
- 0.177 V
 - 0.087 V
 - 0.177 V**
 - 0.059 V
39. What is the current strength in ampere will be required to liberate 10 g of iodine from KI solution in one hour
- 1.11 amp
 - 2.11 amp
 - 4 amp**
 - 10 amp
40. Aluminium displaces hydrogen from dilute Hcl where as silver does not the e.m.f. of the cell prepared by combining Al / Al⁺³ and Ag/Ag⁺ is 2.46 V. The reduction potential of silver electrode is +0.8 V. The reduction potential of aluminium electrode is,
- + 1.66 V
 - 3.26 V
 - + 3.26 V
 - 1.66 V**
41. The reaction A→B follows first order kinetics. The time taken for 0.8 mole of A to produce 0.6 mole of B is 1 hour. What is the time for conversion of 0.9 mole of A produce 0.675 mole of B.
- 1 hour**
 - 0.5 hour
 - 0.25 hour
 - 2.0 hour
42. Gaseous product obtained on thermal decomposition of (NH₄)₂Cr₂O₇ is
- NH₃
 - N₂**
 - O₂
 - NO

43. In the cannizzaro reaction given below, the slowest step is



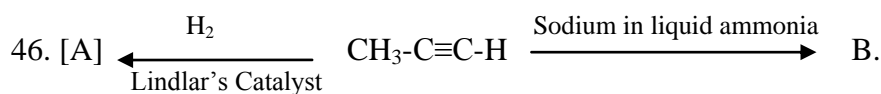
- The attack of OH⁻ at the carbonyl group
- Transfer of hydride ion to carbonyl group**
- The abstract of proton from the carboxylic acid
- The deprotonation of C₆H₅CH₂OH

44. CH₃NH₂ + CHCl₃ + KOH → (Nitrogen containing compd) + Ku + H₂O that compound is

- CH₃-C≡N
- CH₃-NH-CH₃
- CH₃-N⁻≡C⁺
- CH₃-N⁺≡C⁻**

45. The pK_a of acetic acid is 4.74. The concentration of CH₃COOH is 0.01 M. The pH of CH₃COOH is

- 3.37**
- 4.37
- 4.74
- 0.474



[A] and [B] are respectively

- Cis, trans – 2 – butane**
- both trans – 2 – butane
- Trans, cis – 2 – butane
- both cis – 2 – butane

47. The half-life of a reaction is halved as the initial concentration of reactant doubled. The order of reaction is

- 0
- 2
- 1**
- 4

48. Which of the following compound would not form silver mirror with Tollen's reagent.

- CH₃CHO
- HCHO
- R.CO.CHOH-R
- CH₃.CO.CH₃**

49. Arrange Ce^{+3} , La^{+3} , Pm^{+3} and Yb^{+3} in increasing order of their ionic radii
- $\text{Yb}^{+3} < \text{Pm}^{+3} < \text{Ce}^{+3} < \text{La}^{+3}$
 - $\text{Ce}^{+3} < \text{Yb}^{+3} < \text{Pm}^{+3} < \text{La}^{+3}$
 - $\text{Yb}^{+3} < \text{Pm}^{+3} < \text{La}^{+3} < \text{Ce}^{+3}$
 - $\text{Pm}^{+3} < \text{La}^{+3} < \text{Ce}^{+3} < \text{Yb}^{+3}$
50. How many moles of magnesium phosphate $\text{Mg}_3(\text{PO}_4)_2$ will contain 0.25 mole of oxygen atoms?
- 1.25×10^{-2}
 - 2.5×10^{-2}
 - 0.02
 - 3.125×10^{-2}**
51. Which of the following molecule has highest dipole moment?
- BF_3
 - NH_3**
 - NF_3
 - B_2H_6
52. Which of the following is true in respect of adsorption
- $\Delta G < 0$ $\Delta S > 0$ $\Delta H < 0$
 - $\Delta G < 0$ $\Delta S < 0$ $\Delta H < 0$**
 - $\Delta G > 0$ $\Delta S > 0$ $\Delta H < 0$
 - $\Delta G < 0$ $\Delta S < 0$ $\Delta H > 0$
53. Which of the following is least reactive towards nucleophilic displacement reaction when treated with aqueous KOH.
- 2,4,6 – trichlorobenzene
 - 2,4 – dinitro chlorobenzene
 - 4 – nitrochlorobenzene
 - 3 – nitro chlorobenzene**
54. Arrange the following amines in order of increasing basicity
n-butylamine(I) sec-butylamine(II)
iso-butylamine(III) tert-butylamine(IV)
- I < II < III < IV
 - III < IV < I < II
 - IV < III < II < I**
 - II < III < I < IV
55. If the average velocity of N_2 molecule is 0.3 m/s at 27°C , then the velocity of 0.6 m/s will take place at
- 273 K
 - 927 K
 - 1000 K
 - 1200 K**
 - e.

56. From which of the following species it is easiest to remove one electron

- a. $O(g)$ **b. $O^{-2}(g)$** c. $O^{+}(g)$ d. $O^{-}(g)$

57. Cupellation process is used in the metallurgy of

- a. Cu
b. Ag
c. Al
d. Fe

58. Haloform reaction can not be used to prepare

- a. **CHF_3** b. $CHCl_3$ c. $CHBr_3$ d. CHI_3

59. All of the following can denature proteins without hydrolysis except

- a. Enzyme treatment**
b. Mechanical stress
c. Heat
d. Lowering of pH

60. A Vessel filled with a mixture of oxygen and nitrogen. At what ratio of partial pressure will the mass of gases be identical

- a. $PO_2 = 0.5P_{N_2}$ b. $PO_2 = P_{N_2}$ c. $PO_2 = 1.14 P_{N_2}$ **d. $PO_2 = 0.875P_{N_2}$**