

# Consortium of Medical Engineering and Dental Colleges of Karnataka (COMEDK-2005)

## CHEMISTRY

1. A mixture of two moles of carbon monoxide and one mole of oxygen, in a closed vessel is ignited to convert the carbon monoxide to carbon dioxide. If  $\Delta H$  is the enthalpy change and  $\Delta E$  is the change in internal energy, then,
  - 1)  $\Delta H > \Delta E$
  - 2)  $\Delta H < \Delta E$
  - 3)  $\Delta H = \Delta E$
  - 4) the relationship depends on the capacity of the vessel
2. The cooling in refrigerator is due to .....
  - 1) Reaction of the refrigerator gas
  - 2) Expansion of ice
  - 3) The expansion of the gas in the refrigerator
  - 4) The work of the compressor
3. For a system in equilibrium,  $\Delta G = 0$ , under conditions of constant .....
  - 1) temperature and pressure
  - 2) temperature and volume
  - 3) pressure and volume
  - 4) energy and volume
4. Molar heat of vaporisation of a liquid is  $6 \text{ kJ mole}^{-1}$ . If the entropy change is  $16 \text{ J mole}^{-1} \text{ K}^{-1}$ , the boiling point of the liquid is .....
  - 1)  $375^\circ \text{C}$
  - 2)  $375 \text{ K}$
  - 3)  $273 \text{ K}$
  - 4)  $102^\circ \text{C}$
5. The temperature of the system decreases in an .....
  - 1) adiabatic compression
  - 2) isothermal compression
  - 3) isothermal expansion
  - 4) adiabatic expansion

(Space for Rough Work)







21. A precipitate of  $AgCl$  is formed when equal volumes of the following are mixed.  
[ $K_s$  for  $AgCl = 10^{-10}$ ]

- 1)  $10^{-4} M AgNO_3$  and  $10^{-7} M HCl$       2)  $10^{-5} M AgNO_3$  and  $10^{-6} M HCl$   
3)  $10^{-5} M AgNO_3$  and  $10^{-4} M HCl$       4)  $10^{-6} M AgNO_3$  and  $10^{-6} M HCl$

22. Which one of the following defects in the crystals lowers its density ?

- 1) Frenkel defect      2) Schottky defect  
3) F-centres      4) Interstitial defect

23. A radioactive isotope has a half life of 10 days. If today 125 mg is left over, what was its original weight 40 days earlier ?

- 1) 2 g      2) 600 mg  
3) 1 g      4) 1.5 g

24. Which of the particles cannot be accelerated ?

- 1)  $\alpha$  - particle      2)  $\beta$  - particle  
3) Protons      4) Neutrons

25. In which of the following nuclear reactions neutron is emitted ?

- 1)  ${}_{13}^{27}Al + {}_2^4He \rightarrow {}_{15}^{30}P$       2)  ${}_{6}^{12}C + {}_1^1H \rightarrow {}_7^{13}N$   
3)  ${}_{15}^{30}P \rightarrow {}_{14}^{30}Si$       4)  ${}_{96}^{241}Am + {}_2^4He \rightarrow {}_{97}^{245}Bk$

26. Gold is extracted by hydrometallurgical process, based on its property .....

- 1) of being electropositive
- 2) of being less reactive
- 3) to form complexes which are water soluble
- 4) to form salts which are water soluble

27. In blast furnace, iron oxide is reduced by .....

- 1) Hot blast of air
- 2) Carbon monoxide
- 3) Carbon
- 4) Silica

28. Which of the following pairs of elements cannot form an alloy ?

- 1)  $Zn, Cu$
- 2)  $Fe, Hg$
- 3)  $Fe, C$
- 4)  $Hg, Na$

29. Which compound is zero valent metal complex ?

- 1)  $[Cu(NH_3)_4]SO_4$
- 2)  $[Pt(NH_3)_2Cl_2]$
- 3)  $[Ni(CO)_4]$
- 4)  $K_3[Fe(CN)_6]$

30. Alum is a water purifier because it .....

- 1) coagulates the impurities.
- 2) softens hard water
- 3) gives taste
- 4) destroys the pathogenic bacteria

(Space for Rough Work)

31. A compound *A* has a molecular formula  $C_2Cl_3OH$ . It reduces Fehling's solution and on oxidation, gives a monocarboxylic acid *B*. *A* can be obtained by the action of chlorine on ethyl alcohol. *A* is .....
- 1) chloroform
  - 2) chloral
  - 3) methyl chloride
  - 4) monochloro acetic acid
32. Which of the following haloalkanes is most reactive ?
- 1) 1-chloropropane
  - 2) 1-bromopropane
  - 3) 2-chloropropane
  - 4) 2-bromopropane
33. The reaction in which phenol differs from alcohol is .....
- 1) it undergoes esterification with carboxylic acid
  - 2) it reacts with ammonia
  - 3) it forms yellow crystals of iodoform
  - 4) it liberates  $H_2$  with *Na* metal
34. An organic compound *A* containing *C*, *H* and *O* has a pleasant odour with boiling point of  $78^\circ\text{C}$ . On boiling *A* with conc.  $H_2SO_4$ , a colourless gas is produced which decolourises bromine water and alkaline  $KMnO_4$ . The organic liquid *A* is .....
- 1)  $C_2H_5Cl$
  - 2)  $C_2H_5COOCH_3$
  - 3)  $C_2H_5OH$
  - 4)  $C_2H_6$
35. Which of the following is an amphoteric acid ?
- 1) Glycine
  - 2) Salicylic acid
  - 3) Benzoic acid
  - 4) Citric acid

36. Benzyl alcohol and sodium benzoate is obtained by the action of sodium hydroxide on benzaldehyde. This reaction is known as .....
- 1) Perkin's reaction
  - 2) Cannizzaro's reaction
  - 3) Sandmeyer's reaction
  - 4) Claisen condensation
37. Ethyl chloride on heating with  $AgCN$ , forms a compound 'X'. The functional isomer of 'X' is-
- 1)  $C_2H_5NC$
  - 2)  $C_2H_5NH_2$
  - 3)  $C_2H_5CN$
  - 4) None of the above
38. A compound, containing only carbon, hydrogen and oxygen, has a molecular weight of 44. On complete oxidation it is converted into a compound of molecular weight 60. The original compound is .....
- 1) an aldehyde
  - 2) an acid
  - 3) an alcohol
  - 4) an ether
39. Grignard reagent adds to .....
- 1)  $>C=O$
  - 2)  $-C \equiv N$
  - 3)  $>C=S$
  - 4) all of the above
40. Which of the following biomolecules contain a non-transition metal ion ?
- 1) Vitamin  $B_{12}$
  - 2) Chlorophyll
  - 3) Haemoglobin
  - 4) Insulin



41. Three dimensional molecules with cross links are formed in the case of a .....

- 1) Thermoplastic
- 2) Thermosetting plastic
- 3) Both
- 4) None

42. Sucrose molecule is made up of .....

- 1) a gluco pyranose and a fructo pyranose
- 2) a gluco pyranose and a fructo furanose
- 3) a gluco furanose and a fructo pyranose
- 4) a gluco furanose and a fructo furanose

43. Water insoluble component of starch is .....

- 1) amylopectin
- 2) amylose
- 3) cellulose
- 4) none of the above

44. An example for a saturated fatty acid, present in nature is .....

- 1) Oleic acid
- 2) Linoleic acid
- 3) Linolenic acid
- 4) Palmitic acid

45. A Nanopeptide contains ..... peptide linkages.

- 1) 10
- 2) 8
- 3) 9
- 4) 18

46. An example of a sulphur containing amino acid is .....
- 1) Lysine
  - 2) Serine
  - 3) Cysteine
  - 4) Tyrosine
47. Which of the following is not present in a nucleotide ?
- 1) cytosine
  - 2) guanine
  - 3) adenine
  - 4) tyrosine
48. Antiseptic chloroxylenol is
- 1) 4 - chloro - 3, 5 - dimethyl phenol
  - 2) 3 - chloro - 4, 5 - dimethyl phenol
  - 3) 4 - chloro - 2, 5 - dimethyl phenol
  - 4) 5 - chloro - 3, 4 - dimethyl phenol
49. An atom of an element  $A$  has three electrons in its outermost orbit and that of  $B$  has six electrons in its outermost orbit. The formula of the compound between these two will be .....
- 1)  $A_3B_6$
  - 2)  $A_2B_3$
  - 3)  $A_3B_2$
  - 4)  $A_2B$
50. Among  $Na^+$ ,  $Na$ ,  $Mg$  and  $Mg^{2+}$ , the largest particle is .....
- 1)  $Mg^{2+}$
  - 2)  $Mg$
  - 3)  $Na$
  - 4)  $Na^+$



56. A gas decolourised by  $KMnO_4$  solution but gives no precipitate with ammonical cuprous chloride is .....

- |           |              |
|-----------|--------------|
| 1) Ethane | 2) Methane   |
| 3) Ethene | 4) Acetylene |

57. 
$$H_3C - C = CH - CH - CH_3$$
 is  
$$\begin{array}{c} | \\ Cl \end{array} \qquad \begin{array}{c} | \\ CH_3 \end{array}$$

- |                                |                                   |
|--------------------------------|-----------------------------------|
| 1) 2-chloro-4-methyl-2-pentene | 2) 4-chloro-2-methyl-3-pentene    |
| 3) 4-methyl-2-chloro-2-pentene | 4) 2-chloro-4,4-dimethyl-2-butene |

58. Amongst the following, the compound that can most readily get sulphonated is ?

- |                 |                  |
|-----------------|------------------|
| 1) Benzene      | 2) Toluene       |
| 3) Nitrobenzene | 4) Chlorobenzene |

59. Household gaseous fuel (LPG) mainly contains .....

- |             |                |
|-------------|----------------|
| 1) $CH_4$   | 2) $C_2H_2$    |
| 3) $C_2H_4$ | 4) $C_4H_{10}$ |

60. Use of chlorofluoro carbons is not encouraged because .....

- 1) they are harmful to the eyes of people that use it.
- 2) they damage the refrigerators and air conditioners.
- 3) they eat away the ozone in the atmosphere.
- 4) they destroy the oxygen layer.