

**Consortium of Medical Engineering and
Dental Colleges of Karnataka
(COMEDK)
Undergraduate Entrance Test(UGET)**

Chemistry Sample Paper-4

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 ΔH is the enthalpy change and ΔE 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 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°C
 - 2) 375 K
 - 3) 273 K
 - 4) 102°C

5. The temperature of the system decreases in an
 - 1) adiabatic compression
 - 2) isothermal compression
 - 3) isothermal expansion
 - 4) adiabatic expansion

6. 15 moles of H_2 and 5.2 moles of I_2 are mixed and allowed to attain equilibrium at 500°C . At equilibrium, the concentration of HI is found to be 10 moles. The equilibrium constant for the formation of HI is

- 1) 50
- 2) 15
- 3) 100
- 4) 25

7. If, in the reaction $N_2O_4 \leftrightarrow 2NO_2$, x is that part of N_2O_4 which dissociates, then the number of molecules at equilibrium will be

- 1) 1
- 2) 3
- 3) $(1 + x)$
- 4) $(1 + x)^2$

8. Which of these does not influence the rate of reaction ?

- 1) Nature of the reactants
- 2) Concentration of the reactants
- 3) Temperature of the reaction
- 4) Molecularity of the reaction

9. For the reaction $A + B \rightarrow C$, it is found that doubling the concentration of A increases the rate by 4 times, and doubling the concentration of B doubles the reaction rate. What is the overall order of the reaction ?

- 1) 4
- 2) $\frac{3}{2}$
- 3) 3
- 4) 1

10. The rate at which a substance reacts depends on its

- 1) atomic weight
- 2) atomic number
- 3) molecular weight
- 4) active mass

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) α - particle 2) β - 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

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 $78^\circ C$. 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^+

51. Molarity of $0.2\text{ N H}_2\text{SO}_4$ is
- 1) 0.2
 - 2) 0.4
 - 3) 0.6
 - 4) 0.1
52. In the equation of state of an ideal gas $PV = nRT$, the value of the universal gas constant would depend only on
- 1) the nature of the gas
 - 2) the pressure of the gas
 - 3) the units of the measurement
 - 4) None of the above
53. A commercial sample of hydrogen peroxide is labelled as 10 volume. Its percentage strength is nearly
- 1) 1%
 - 2) 3%
 - 3) 10%
 - 4) 90%
54. Activated charcoal is used to remove colouring matter from pure substances. It works by
- 1) oxidation
 - 2) reduction
 - 3) bleaching
 - 4) adsorption
55. When plants and animals decay, the organic nitrogen is converted into inorganic nitrogen. The inorganic nitrogen is in the form of
- 1) Ammonia
 - 2) Elements of nitrogen
 - 3) Nitrates
 - 4) Nitrides

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
 | |
 Cl CH_3

- | | |
|--------------------------------|-----------------------------------|
| 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.