CET – CHEMISTRY – 2012

VERSION CODE: A – 2

1. The ore that is concentrated by the Froth floatation process is
   a) Chalcopyrites b) Cryolite c) Cuprite d) Calamine

Ans: (a)

2. The equivalent mass of a certain bivalent metal is 20. The molecular mass of its anhydrous chloride is
   a) 91 b) 111 c) 55.5 d) 75.5

Ans: (b)

3. 2 moles of $N_2O_{4\ (g)}$ is kept in a closed container at 298 K and under 1 atm pressure. It is heated to 596 K when 20% by mass of $N_2O_{4(g)}$ decomposes to NO_2. The resulting pressure is
   a) 2.4 atm b) 1.2 atm c) 4.8 atm d) 2.8 atm

Ans: (a)

4. Sucrose is NOT a reducing sugar since
   a) it is chemically stable
   b) it contains no free aldehydes or keto group adjacent to a CHOH group
   c) it is built up of a fructose unit
   d) it is optically active

Ans: (b)

5. Which one of the following contains ionic, covalent and co-ordinate bonds?
   a) NaOH b) NaCl c) NaCN d) NaNC

Ans: (d)

6. Dialysis can be used to separate
   a) glucose and fructose b) protein and starch
   c) glucose and protein d) glucose and NaCl

Ans: (c)

7. The percentage of p-character of the hybrid orbitals in graphite and diamond are respectively
   a) 33 and 25 b) 50 and 75 c) 67 and 75 d) 33 and 75

Ans: (c)

8. A gas expands from a volume of $1m^3$ to a volume of 2 m^3 against an external pressure of 10^5 Nm^{-2}.
   The work done by the gas will be
   a) 10^5 kJ b) 10^2 kJ c) 10^2 kJ d) 10^3 kJ

Ans: (b)

9. The mass of a non-volatile solute of molar mass 40 g mol^{-1} that should be dissolved in 114 g of octane to lower its vapour pressure by 20% is
   a) 10 g b) 11.4 g c) 9.8 g d) 12.8 g

Ans: (a)

10. During the adsorption of a gas on the surface of a solid, which of the following is true?
    a) $\Delta G < O$, $\Delta H > O$, $\Delta S < O$ b) $\Delta G > O$, $\Delta H < O$, $\Delta S < O$
    c) $\Delta G < O$, $\Delta H < O$, $\Delta S < O$ d) $\Delta G < O$, $\Delta H < O$, $\Delta S > O$

Ans: (c)

11. The approximate time duration in hours to electroplate 30 g of calcium from molten calcium chlriode using a current of 5 amp is
    [At. Mass of Ca = 40]
    a) 8 b) 80 c) 10 d) 16

Ans: (a)

12. The pH of the solution obtained by mixing 100 ml of a solution of pH = 3 with 400 ml of a solution of pH = 4 is

a) 3 – log 2.8 b) 7 – log 2.8 c) 4 – log 2.8 d) 5 – log 2.8

Ans: (c)

13. The equilibrium constant of the reaction:

$A_{(s)} + 2B^{+}_{(aq)} \rightleftharpoons A^{2+}_{(aq)} + 2B_{(s)}$. $E^{o}_{cell} = 0.0295$ V is

$\left[\frac{2.303RT}{F} = 0.059\right]$

a) 10 b) 2×10^2 c) 3×10^2 d) 2×10^5

Ans: (a)

14. An oxygen containing organic compound was found to contain 52% carbon and 13% of hydrogen. Its vapour density is 23. The compound reacts with sodium metal to liberate hydrogen. A functional isomer of this compound is

a) Ethanol b) Ethanal c) Methoxy Metane d) Methoxy Ethane

Ans: (c)

15. Which one of the following is NOT true regarding electromeric effect ?

a) It results in the appearance of partial charges on the carbon atoms

b) It is a temporary effect

c) It operates on multiple bonds

d) It requires an attacking reagent

Ans: (a)

16. Which one of the following is NOT formed when a mixture of methyl bromide and bromobenzene is heated with sodium metal in the presence of dry Ether?

a) Ethane b) Diphenyl c) Propane d) Toluene

Ans: (c)

17. Power alcohol is a mixture of

a) 80% Petrol + 20% Benzene + Small quantity of Ethanol

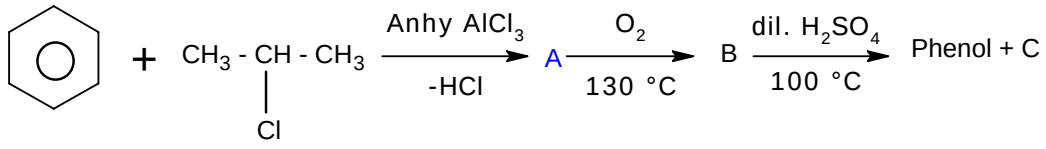
b) 80% Petrol + 20% Ethanol + Small quantity of Benzene

c) 80% Ethanol + 20% Benzene + Small quantity of Petrol

d) 50% Petrol + 50% Ethanol + Small quantity of Benzene

Ans: (b)

18. Identify 'C' in the following



a) Water b) Ethanol

c) Propanone d) Cumene hydroperoxide

Ans: (c)

19. 20 ml of methane is completely burnt using 50 ml of oxygen. The volume of the gas left after cooling to room temperature is

a) 80 ml b) 40 ml c) 60 ml d) 30 ml

Ans: (d)

20. 100 ml of 0.1 M acetic acid is completely neutralized using a standard solution of NaOH. The volume of Ethane obtained at STP after the complete electrolysis of the resulting solution is

a) 112 ml b) 56 ml c) 224 ml d) 560 ml

Ans: (a)

21. Saccharin, an artificial sweetner, is manufactured from

a) Cellulose b) Toluene c) Cyclohexane d) Starch

Ans: (b)

22. Which of the following is NOT TRUE for S_N^1 reaction?

a) Favoured by polar solvents

b) 3^o – alkyl halides generally react through S_N^1 reaction

c) The rate of reaction does not depend upon the molar concentration of the nucleophile

d) 1^o – alkyl halides generally react through S_N^1 reaction

Ans: (d)

23. Oil of winter green is

a) an ester b) a carboxylic acid c) an alcohol d) a ketone

Ans: (a)

24. An organic compound 'A' burns with a sooty flame. It is negative towards Tollen's reagent test and positive for Borsche's reagent test. The compound 'A' is

a) Benzaldehyde b) Acetophenone c) Acetone d) Salicylic acid

Ans: (b)

25. For a reaction : A + B $\rightarrow$ Products, the rate of the reaction at various concentrations given below :

Expt No	[A]	[B]	Rate (mol dm^{-3} s^{-1})
1	0.2	0.2	2
2	0.2	0.4	4
3	0.2	0.4	36

The rate law for the above reaction is

a) $r = K[A]^2[B]$ b) $r = K[A][B]^2$ c) $r = K[A]^3[B]$ d) $r = K[A]^2[B]^2$

Ans: (a)

26. Which one of the following has NO unpaired electrons?

a) O_2 b) O_2^- c) O_2^+ d) O_2^{--}

Ans: (d)

27. The atomic number of cobalt is 27. The EAN of cobalt in $Na_3[Co(NO_2)_4Cl_2]$ is

a) 35 b) 24 c|) 36 d) 34

Ans: (c)

28. The "spin only" magnetic moment of Ni^{2+} in aqueous solution would be [At. No. of Ni = 28]

a) $\sqrt{6}$ BM B) $\sqrt{15}$ BM c) $\sqrt{2}$ BM d) $\sqrt{8}$ BM

Ans: (d)

29. Impossible orbital among the following is

a) 2s b) 3 f c) 2p d) 4 d

Ans: (b)

30. The total number of electrons in 18 ml of water (density = 1 g ml^{-1}) is

a) 6.02×10^{23} b) 6.02×10^{25} c) 6.02×10^{24} d) $6.02 \times 18 \times 10^{23}$

Ans: (c)

31. The number of moles of hydrogen that can be added to 1 mole of an oil is the highest in

a) Linseed oil b) Groundnut oil c) Sunflower seed oil d) Mustard oil

Ans: (a)

32. The reaction between sodium and water can be made less vigorous by

a) lowering the temperature b) adding a little alcohol

c) amalgamating sodium d) adding a little acetic acid

Ans: (c)

33. All colloidal dispersions have

a) very high osmotic pressure b) low osmotic pressure

c) no osmotic pressure d) high osmotic pressure

Ans: (c)

34. Silver iodide is used for producing artificial rain because AgI

a) is easy to spray at high altitude

b) is easy to synthesize

c) has crystal structure similar to ice

d) is insoluble in water

Ans: (c)

35. The equilibrium constant of a reaction is 0.008 at 298 K. The standard free energy change of the reaction at the same temperature is

a) +11.96 kJ b) -11.96 kJ c) -5.43 kJ d) -8.46 kJ

Ans: (a)

36. The function of potassium ethyl xanthate in froth floatation process is to make the ore

a) attracted towards water b) water repellant

c) lighter d) heavier

Ans: (a)

37. The correct order of electronegativities of N, O, F & P is

a) F > N > P > O b) F > O > P > N c) F > O > N > P d) N > O > F > P

Ans: (c)

38. The s-block element used as a catalyst in the manufacture of Buna –S rubber is

a) Mg b) Ca c) Ba d) Na

Ans: (d)

39. Which of the following is NOT a characteristic of a covalent compound?

a) Low melting point

b) No definite geometry

c) Insoluble in polar solvent

d) Small difference in electronegativity between the combining atoms

Ans: (a)

40. The volume of 0.1 M oxalic acid that can be completely oxidized by 20 ml of 0.025 M $KMnO_4$ solution is

a) 125 ml b) 25 ml c) 12.5 ml d) 37.5 ml

Ans: (c)

41. A ligand is

a) Lewis acid b) Bronsted acid

c) either a Lewis acid or a Lewis base d) Lewis base

Ans: (d)

42. The vapour pressures of two liquids A and B in their pure states are in the ratio of 1 : 2. A binary solution of A and B contains A and B in the mole proportion of 1 : 2. The mole fraction of A in the vapour phase of the solution will be

a) 0.33 b) 0.2 c) 0.25 d) 0.52

Ans: (b)

43. Which of the following statements is TRUE?

a) The total entropy of the universe remains constant

b) The total entropy of the universe is continuously decreasing

c) The total energy of the universe is continuously decreasing

d) The total energy of the universe remains constant

Ans: (d)

44. 5 ml of 0.4 N NaOH is mixed with 20 ml of 0.1 N HCl. The pH of the resulting solution will be

a) 6 b) 7 c) 8 d) 5

Ans: (b)

45. On adding which of the following, the pH of 20 ml of 0.1 N HCl will not alter?

a) 1 ml of 1 N HCl

b) 20 ml of distilled water

c) 1 ml of 0.1 N NaOH

d) 500 ml of HCl of pH = 1

Ans: (d)

46. Which one of the following has a potential more than zero?

a) Pt, $\frac{1}{2}H_2$ (1 atm) | HCl (1 M)

b) Pt, $\frac{1}{2}H_2$ (1 atm) | HCl (2 M)

c) Pt, $\frac{1}{2}H_2$ (1 atm) | HCl (0.1 M)

d) Pt, $\frac{1}{2}H_2$ (1 atm) | HCl (0.5 M)

Ans: (b)

47. HCHO was treated with a reagent X. The product formed upon hydrolysis in the presence of an acid gave C_2H_5OH. The reagent X is

a) aqueous KOH b) alcoholic KOH c) alcoholic KCN d) CH_3 MgI

Ans: (d)

48. Benzylamine is a stronger base than aniline because

a) The lone pair of electrons on the nitrogen atom in benzylamine is delocalised

b) The lone pair of electrons on the nitrogen atom in aniline is delocalized

c) The lone pair of electrons on the nitrogen atom in aniline is not involved in resonance

d) Benzylamine has a higher molecular mass than aniline

Ans: (b)

49. The relative acidic strengths of benzoic acid, o-toluic acid and p-toluic acid is of the decreasing order:

a) p-toluic acid > o-toluic acid > benzoic acid

b) o-toluic acid > p-toluic acid > benzoic acid

c) p-toluic acid > benzoic acid > o-toluic acid

d) o-toluic acid > benzoic acid > p-toluic acid

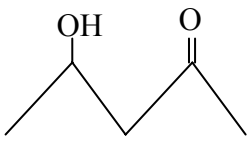
Ans: (d)

50. The C-H bond C-C bond in ethane are formed by which of the following types of overlap?

a) sp^3-s and sp^3-sp^3 b) sp^2-s and sp^2-sp^2 c) sp-s and sp-sp d) p-s and p-p

Ans: (a)

51. The IUPAC name of



a) 4-Hydroxy-2-pentanone

b) 2-Hydroxy-4-pentanone

c) 2-Oxo-4-pentanol

d) 4-Keto-2-pentanol

Ans: (a)

52. A first order reaction is 60% complete in 20 minutes. How long will the reaction take to be 84% complete?

a) 54 mins b) 68 mins c) 40 mins d) 76 mins

Ans: (c)

53. A given sample of milk turns sour at room temperature (27^0C) in 5 hours. In a refrigerator at -3^0C, it can be stored 10 times longer. The energy of activation for the souring of milk is

a) $2.303 \times 10 R$ kJ . mol^{-1} b) $2.303 \times 5 R$ kJ . mol^{-1}

c) $2.303 \times 3 R$ kJ . mol^{-1} d) $2.303 \times 2.7 R$ kJ . mol^{-1}

Ans: (d)

54. At 300 K, a gaseous reaction:

$A \rightarrow B + C$

Was found to follow first order kinetics. Starting with pure A, the total pressure at the end of 20 minutes was 100 mm of Hg. The total pressure after the completion of the reaction is 180 mm of Hg. The partial pressure of A (in mm of Hg) is

a) 100 b) 90 c) 180 d) 80

Ans: (d)

55. From the Ellingham graphs on carbon, which of the following statements is FALSE?

a) CO_2 is more stable than CO at less than 983 K

b) CO reduces Fe_2O_3 to Fe at less than 983 K

c) CO is less stable than CO_2 at more than 983 K

d) CO reduces Fe_2O_3 to Fe in the reduction zone of Blast furnace

Ans: (c)

56. Which of the following is a negatively charged bidentate ligand?

a) Dimethyl glyoximato b) Cyano

c) Ethylene diamine d) Acetato

Ans: (a)

57. The secondary valency of platinum in tetra ammine dichloroplatinum (IV) chloride is

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

Ans: (d)

58. Which one of the following has a magnetic moment of 1.75 BM?

a) Ti^{3+} b) V^{3+} c) Cr^{3+} d) Fe^{3+}

Ans: (a)

59. The correct order of ionisation energy of C, N, O & F is

a) F < N < C < O b) C < N < O < F c) C < O < N < F d) F < O < N < C

Ans: (c)

60. The correct set of four quantum numbers for the outermost electron of sodium (Z = 11) is

a) 3, 1, 0, $\frac{1}{2}$ b) 3, 1, 1, $\frac{1}{2}$ c) 3, 2, 1, $\frac{1}{2}$ d) 3, 0, 0, $\frac{1}{2}$

Ans: (d)