

CET – CHEMISTRY – 2011

VERSION CODE: D – 3

1. If the energies of the two photons are in the ratio of 3: 2, their wavelengths will be in the ratio of

- 1) 2: 3 2) 9: 4 3) 3: 2 4) 1: 2

Ans: (1)

2. Which one of these is NOT TRUE for benzene?

- 1) It forms only one type of monosubstituted product
2) There are three carbon-carbon single bonds and three carbon-carbon double bonds
3) Heat of hydrogenation of benzene is less than the theoretical value
4) The bond angle between carbon-carbon bonds is 120°

Ans: (2)

3. Generally, the first ionization energy increases along a period. But there are some exceptions. The one which is NOT an exception is.....

- 1) Be and B 2) Na and Mg 3) Mg and Al 4) N and O

Ans: (2)

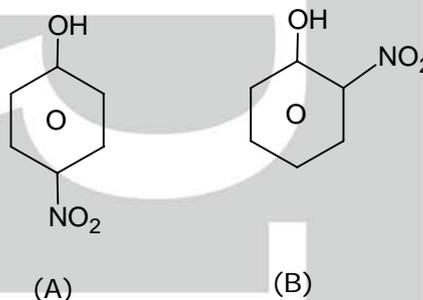
4. Out of the given two compounds, the vapour pressure of B at a particular temperature is

1) higher than that of A

2) lower than that of A

3) higher or lower than A depending on the size of the vessel

4) same as that of A



Ans: (1)

5. Increasing order of carbon-carbon bond length for the following is

- | | | | |
|--------------------|----------|--------------------|----------|
| C_2H_4 | C_2H_2 | C_6H_6 | C_2H_6 |
| (A) | (B) | (C) | (D) |
| 1) $C < B < A < D$ | | 2) $B < C < A < D$ | |
| 3) $D < C < A < B$ | | 4) $B < A < C < D$ | |

Ans: (4)

6. The IUPAC name of the complex $[Co(NH_3)_4Cl_2]Cl$ is

- 1) tetraammine dichloro cobalt (III) chloride
- 2) dichloro tetraammine cobalt (III) chloride
- 3) tetraammine dichloro cobalt (IV) chloride
- 4) tetraammine dichloro cobalt (II) chloride

Ans: (1)

7. Excess of silver nitrate solution is added to 100 ml of 0.01 M Pentaqua chloro chromium (III) chloride solution. The mass of silver chloride obtained in grams is

[Atomic mass of silver is 108]

- 1) 143.5×10^{-3}
- 2) 287×10^{-3}
- 3) 287×10^{-2}
- 4) 143.5×10^{-2}

Ans: (2)

8. The following data were obtained during the first order decomposition of $2A_{(g)} \rightarrow B_{(g)} + C_{(s)}$ at a constant volume and at a particular temperature.

Sr. No.	Time	Total pressure in Pascal
1	At the end of 10 min	300
2	After completion	200

The rate constant in min^{-1} is

- 1) 69.3
- 2) 0.0693
- 3) 6.93×10^{-4}
- 4) 6.93

Ans: (2)

9. The time required for 100% completion of a zero order reaction is

- 1) $\frac{a}{2k}$ 2) ak 3) $\frac{2k}{a}$ 4) $\frac{a}{k}$

Ans: (4)

10. The activation energy of a reaction at a given temperature is found to be $2.303 RT \text{ J mol}^{-1}$. The ratio of rate constant to the Arrhenius factor is

- 1) 0.1 2) 0.01 3) 0.001 4) 0.02

Ans: (1)

11. The yellow precipitate formed during the chromyl chloride test is chemically

- 1) lead chromate 2) chromic acid
3) sodium chromate 4) lead acetate

Ans: (1)

12. One gram of silver gets distributed between 10 cm^3 of molten zinc and 100 cm^3 of molten lead at 800°C . The percentage of silver still left in the lead layer is approximately

- 1) 5 2) 2 3) 1 4) 3

Ans: (4)

13. Which one of the following is true?

- 1) NaOH is a primary standard in volumetric analysis
2) NaOH is used in the concentration of bauxite ore
3) NaOH solution does not react with Cl_2
4) Manganous hydroxide is soluble excess of NaOH solution

Ans: (2)

14. In Ramsay and Rayleigh's isolation of noble gases from air, the nitrogen of the air is finally converted into

- 1) NO and NO_2 2) NaNO_2 only 3) NaNO_2 and NaNO_3 4) NaNO_3 only

Ans: (3)

15. The spin only magnetic moment of Fe^{2+} ion (in BM) is approximately

- 1) 7 2) 4 3) 6 4) 5

Ans: (4)

16. A mixture of CaCl_2 and NaCl weighing 4.44 g is treated with sodium carbonate solution to precipitate all the calcium ions as calcium carbonate. The calcium carbonate so obtained is heated strongly to get 0.56 g of CaO . The percentage of NaCl in the mixture is

[Atomic mass of $\text{Ca} = 40$]

- 1) 75 2) 31.5 c) 40.2 d) 25

Ans: (1)

17. 50 cm^3 of 0.2 N HCl is titrated against 0.1 N NaOH solution. The titration was discontinued after adding 50 cm^3 of NaOH . The remaining titration is completed by adding 0.5 N KOH . The volume of KOH required for completing the titration is

- 1) 12 cm^3 2) 10 cm^3 3) 21.0 cm^3 4) 16.2 cm^3

Ans: (2)

18. The rms velocity of hydrogen is $\sqrt{7}$ times the rms velocity of nitrogen. If T is the temperature of the gas, which of the following is true?

- 1) $T_{\text{H}_2} = \sqrt{7} T_{\text{N}_2}$ 2) $T_{\text{N}_2} = T_{\text{H}_2}$ 3) $T_{\text{N}_2} = \sqrt{7} T_{\text{H}_2}$ 4) $T_{\text{N}_2} = 2 T_{\text{H}_2}$

Ans: (4)

19. 25 g of each of the following gasses are taken at 27°C and 600 mm pressure. Which of these will have the least volume?

- 1) HCl 2) HBr 3) HI 4) HF

Ans: (3)

20. The amount of heat evolved when 500 cm^3 of 0.1 M HCl is mixed with 200 cm^3 of 0.2 M NaOH is

- 1) 2.292 kJ 2) 1.292 kJ 3) 22.9 kJ 4) 0.292 kJ

Ans: (1)

26. Which one of the following statements is FALSE?

- 1) The ore is freed from almost all nonmetallic impurities.
- 2) During roasting, moisture is removed from the ore.
- 3) The concentrated zinc blende is subjected to calcinations during its extraction by pyrometallurgy.
- 4) Calcination of ore is carried out in the absence of any blast of air.

Ans: (3)

27. Which one of the following sets of quantum numbers represents the highest energy level in an atom?

- 1) $n = 3, \ell = 1, m = 1, s = +\frac{1}{2}$
- 2) $n = 4, \ell = 0, m = 0, s = +\frac{1}{2}$
- 3) $n = 3, \ell = 0, m = 0, s = +\frac{1}{2}$
- 4) $n = 3, \ell = 2, m = -2, s = +\frac{1}{2}$

Ans: (4)

28. When O_2 is converted into O_2^+ ;

- 1) bond order decreases
- 2) both paramagnetic character and bond order increase
- 3) paramagnetic character decreases and the bond order increases
- 4) paramagnetic character increases

Ans: (3)

29. In chromite ore, the oxidation number iron and chromium are respectively

- 1) +3, +6
- 2) +3, +2
- 3) +2, +3
- 4) +2, +6

Ans: (3)

30. The number of naturally occurring p-block elements that are diamagnetic is

- 1) 6
- 2) 18
- 3) 7
- 4) 5

Ans: (4)

31. The enthalpy of vaporization of benzene is + 35.3 kJ/mol at its boiling point of 80° C. The entropy change in the transition of vapour to liquid at its boiling point is

[in J mol⁻¹ K⁻¹]

- 1) + 100 2) - 100 3) - 342 4) + 342

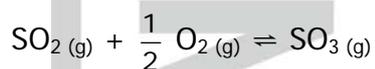
Ans: (2)

32. Based on the first law of thermodynamics, which one of the following is correct?

- 1) For an isochoric process, $\Delta U = -q$ 2) For an isochoric process, $q = +w$
3) For a cyclic process, $q = -w$ 4) For an adiabatic process, $\Delta U = -w$

Ans: (3)

33. Consider the following gaseous equilibria with equilibrium constants K_1 and K_2 respectively.



The equilibrium constants are related as

- 1) $K_1^2 = \frac{1}{K_2}$ 2) $2K_1 = K_2^2$ 3) $K_2 = \frac{2}{K_1^2}$ 4) $K_2^2 = \frac{1}{K_1}$

Ans: (1)

34. During the adsorption of Krypton on activated charcoal at low temperature;

- 1) $\Delta H > 0$ and $\Delta S < 0$ 2) $\Delta H < 0$ and $\Delta S < 0$
3) $\Delta H < 0$ and $\Delta S > 0$ 4) $\Delta H > 0$ and $\Delta S > 0$

Ans: (2)

35. For the reversible reaction, $A_{(s)} + B_{(g)} \rightleftharpoons C_{(g)} + D_{(g)}$ $\Delta G^0 = -350$ kJ, which one of the following statements is true?

- 1) The entropy change is negative
2) The reaction is thermodynamically nonfeasible
3) The reaction should be instantaneous
4) Equilibrium constant is greater than one.

Ans: (4)

36. Identify B and D is the following sequence of reactions.



- 1) Ethyl hydrogen sulphate and alcoholic KOH
- 2) Methanol and bromoethane
- 3) Ethanol and alcoholic KOH
- 4) Ethyl hydrogen sulphate and aqueous KOH

Ans: (3)

37. The compound which gives turbidity immediately with Lucas reagent at room temperature is

- 1) butan-2-ol
- 2) butan-1-ol
- 3) 2-methyl propan-1-ol
- 4) 2-methyl propan-2-ol

Ans: (4)

38. Ethyl benzene CANNOT be prepared by

- 1) Wurtz-Fittig reaction
- 2) Wurtz reaction
- 3) Clemmensen reduction
- 4) Friedel-Crafts reaction

Ans: (2)

39. 1.2 g of organic compound on Kjeldahlization liberates ammonia which consumes 30 cm³ of 1 N HCl. The percentage of nitrogen in the organic compound is

- 1) 35
- 2) 30
- 3) 20.8
- 4) 46.67

Ans: (1)

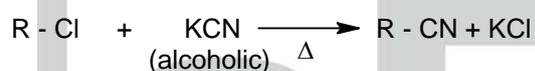
40. Carbon cannot reduce Fe_2O_3 to Fe at a temperature below 983 K because
- 1) CO is thermodynamically more stable than Fe_2O_3
 - 2) free energy change for the formation of CO is more negative than that of Fe_2O_3
 - 3) iron has higher affinity towards oxygen than carbon
 - 4) carbon has higher affinity towards oxygen than iron

Ans: (3)

41. Which one of the following is NOT TRUE for the hydrolysis of t-butyl bromide with aqueous NaOH?
- 1) The intermediate formed is a carbocation.
 - 2) Reaction occurs through the $\text{S}_{\text{N}}1$ mechanism.
 - 3) Rate of the reaction doubles when the concentration of t-butyl bromide is doubled
 - 4) Rate of the reaction doubles when the concentration of alkali is doubled.

Ans: (4)

42. Following is the substitution reaction in which $-\text{CN}$ replaces $-\text{Cl}$



To obtain propanenitrile, R-Cl should be

- 1) 1-chloropropane
- 2) chloroethane
- 3) 2-chloropropane
- 4) chloromethane

Ans: (2)

43. The conversion of m-nitrophenol to resorcinol involves respectively
- 1) diazotization, reduction and hydrolysis
 - 2) hydrolysis, diazotization and reduction
 - 3) reduction, diazotization and hydrolysis
 - 4) hydrolysis, reduction and diazotization

Ans: (3)

50. Which one of the following DOES NOT involve coagulation?

- 1) Formation of delta region
- 2) Clotting of blood by the use of ferric chloride
- 3) Peptization
- 4) Treatment of drinking water by potash alum

Ans: (3)

51. Which of the following gives an aldehyde on dry distillation?

- 1) Calcium acetate + calcium benzoate
- 2) Calcium formate + calcium acetate
- 3) Calcium benzoate
- 4) Calcium acetate

Ans: (2)

52. α - maltose consists of

- 1) two α -D-glucopyranose units with 1-2 glycosidic linkage
- 2) one α -D-glucopyranose units and one β -D-glucopyranose unit with 1-2 glycosidic linkage
- 3) two α -D-glucopyranose units with 1-4 glycosidic linkage
- 4) two β -D-glucopyranose units with 1-4 glycosidic linkage

Ans: (3)

53. Which one of the following DOES NOT correctly match with each other?

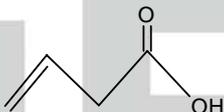
- 1) Lipase-enzyme
- 2) Silk-polyamide
- 3) Oxytocin-enzyme
- 4) Butter-fat

Ans: (3)

54. In an alkaline medium, glycine predominantly exists as/in a /an

- 1) anion
- 2) cation
- 3) covalent form
- 4) zwitterions

Ans: (1)

55. The IUPAC name of  is

- 1) but-1-enoic acid
- 2) but-3-enoic acid
- 3) prop-2-enoic acid
- 4) pent-4-enoic acid

Ans: (2)

56. A solution of two liquids boils at a temperature more than the boiling point of either of them. Hence, the binary solution shows
- 1) positive deviation from Raoult's law
 - 2) negative deviation from Raoult's law
 - 3) positive or negative deviation from Raoult's law depending upon the composition
 - 4) no deviation from Raoult's law

Ans: (2)

57. Which one of the nitrogen atoms in $\text{H}_2\text{N}-\text{NH}-\overset{\text{O}}{\parallel}{\text{C}}-\text{NH}_2$ is the most nucleophilic?
- I II III
- 1) I
 - 2) III
 - 3) All three nitrogen atoms are equally strong nucleophilic centers
 - 4) II

Ans: (1)

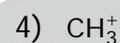
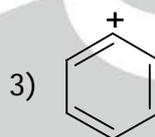
58. The maximum number of possible isomers in 1-bromo-2-methyl cyclobutane is
- 1) 2
 - 2) 4
 - 3) 16
 - 4) 8

Ans: (2)

59. Which one of the following is the most energetic conformation of cyclohexane?
- 1) Twisted boat
 - 2) Boat
 - 3) Half chair
 - 4) Chair

Ans: (3)

60. Which one of the following is an intermediate in the reaction of benzene with CH_3Cl in the presence of anhydrous AlCl_3 ?



Ans: (4)