

Previous Year Paper

Chemistry - 2011



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

A. *n* = 4, *l* = 0, *m* = 0, *s* = +12 B. *n* = 3, *l* = 1, *m* = 1, *s* = +12

- C. n = 3, l = 2, m = -2, s = +12
- D. n = 3, l = 0, m = 0, s = +12

Answer

- 2. When O_2 is converted into O2+
 - A. both paramagnetic character and bond order increase
 - B. bond order decreases
 - C. paramagnetic character increases
 - D. paramagnetic character decreases and the bond order increases

Answer

- 3. If the energies of the two photons in the ratio of 3 : 2, their wavelength will be in the ratio of
 - A. 2 : 3
 - B. 9:4
 - C. 3 : 2
 - D. 1:2

Answer

- 4. Generally, the first ionisation energy increases along a period. But there are some exceptions. The one which is not an exception is
 - A. Be and B
 - B. Na and Mg
 - C. Mg and Al
 - D. N and O

Answer

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



A. higher than that of A

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C. higher or lower than A depending on the size of the vessel Study Assignments, Solved Previous Year Papers . Questions and Answers. Free Forever.

Answer

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

C2H4(A) C2H2(B) C6H6(C) C2H6(D)

- A. C < B < A < DB. B < C < A < DC. D < C < A < BD. B < A < C < DAnswer
- 7. 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 Ca = 40)
 - - A. 75
 - B. 31.5
 - C. 40.2
 - D. 25

Answer

- 8. 50 cm³ of 0.2 N HCl is titrated against 0.1 N NaOH solution. The titration was discontinued after adding 50 cm³ of NaOH. The remaining titration is completed by adding 0.5 N KOH. The volume of KOH required for completing the titration is
 - A. 12 cm³
 - B. 10 cm³
 - C. 21.0 cm^3
 - D. 16.2 cm³

Answer

- 9. The *rms* velocity of hydrogen is 7 times the *rms* velocity of nitrogen. If T is the temperature of the gas, which of the following is true?
 - A. TH2 = 7 TN2
 - B. TN2 = TH2
 - C. TN2 = 7 TH2
 - D. TN2 = 2TH2

Answer

10. 25 g of each of the following gasses are taken at 27°C and 600 mm pressure. Which of these will



B. HBr

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D. HF

Answer

- 11. The amount of heat evolved when 500 cm³ of 0.1 M HCl is mixed with 200 cm³ of 0.2 M NaOH is
 - A. 2.292 kJ
 - B. 1.292 kJ
 - C. 22.9 kJ
 - D. 0.292 kJ

Answer

- 12. The enthalpy of vaporization of benzene is +35.3 kJ/mol at its boiling point, 80°C. The entropy change in the transition of vapour to liquid at its boiling point is
 - A. -100
 - B. +100
 - C. +342
 - D. -342

Answer

- 13. Based on the first law of thermodynamics, which one of the following is correct?
 - A. For an isothermal process, Q = + W
 - B. For an isochoric process, $\Delta U = -Q$
 - C. For an adiabatic process, $\Delta U = -W$
 - D. For a cyclic process, Q = -W

Answer

14. Consider the following equilibria with equilibrium constants K_{1} and K_{2} respectively,

 SO_2 (g) + 12O2 (g) \rightleftharpoons SO_3 (g)

 $2SO_3$ (g) $\rightleftharpoons 2SO_2$ (g) + O_2 (g)

The equilibrium constants are related as

- A. $2K_1 = K22$
- B. K12 = 1K2
- C. K22 = 1K1
- D. K2 = 2K12

Answer

- 15. For the reversible reaction, A (s) + B (g) \rightleftharpoons C (g) + D (g), $\Delta G^{\circ} = -350$ kJ, which one of the following statements is true?
 - A. The reaction is thermodynamically non-feasible
 - B. The entropy change is negative

C. Equilibrium constant is greater than one Like. Share. Bookmark. Download. Make Notes. Print - Your Favourite Questions. Join www.zigya.com



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- Study, Assignments, Solved Previous Year Papers . Questions and Answers. Free Forever. 16. The spin only magnetic moment of Fe^{2+} ion (in BM) is approximately
 - A. 4
 - B. 7
 - C. 5
 - D. 6

Answer

- 17. Excess of silver nitrate solution is added to 100 mL of 0.01 M pentaaqua chloro chromium (III) chloride solution. The mass of silver chloride obtained in grams is [Atomic mass of silver is 108].
 - A. 287×10^{-3}
 - B. 143.5×10^{-3}
 - C. 143.5 \times 10⁻²
 - D. 287×10^{-2}

Answer

18. 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.

S. 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

A. 0.0693
B. 69.3
C. 6.93
D. 6.93 × 10⁻⁴

- 19. The activation energy of a reaction at a given temperature is found to be 2.303 RT J mol⁻¹. The ratio of rate constant to the Arrhenius factor is
 - A. 0.01 B. 0.1 C. 0.02 D. 0.001 Answer

pH value of which one of the following is not equal to one?
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B. 0.1 M HNO₃ Study, Assignments, Solved Previous Year Papers . Questions and Answers. Free Forever. C. 0.05 M H_2SO_4

D. $50 \text{ cm}^3 0.4 \text{ M} \text{ HCl} + 50 \text{ cm}^3 0.2 \text{ M} \text{ NaOH}$

Answer

- 21. A buffersolution contains 0.1 mole of sodium acetate dissolved in 1000 cm³ of 0.1 M acetic acid.
 To the above buffersolution, 0.1 mole of sodium acetate is further added and dissolved. The pH of the resulting buffer is
 - A. pK_a
 - B. $pK_{a} + 2$

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- C. $pK_a log$
- D. $pK_a + \log 2$

Answer

22. H_2S is passed into one nm³ of a solution containing 0.1 mole of Zn^{2+} and 0.01 mole of Cu^{2+} till the

sulphide ion concentration reaches to 8.1×10^{-19} moles. Which one of the following statements is true?

[K_{sp} of ZnS and CuS are 3 \times 10 $^{\text{-}22}$ and 8 \times 10 $^{\text{-}36}$ respectively.]

- A. Only ZnS precipitates
- B. Both CuS and ZnS precipitate
- C. Only CuS precipitates
- D. No precipitation occurs

Answer

- 23. 0.023 g of sodium metal is reacted with 100 cm³ of water. The pH of the resulting solution is
 - A. 10
 - B. 8
 - C. 9
 - D. 12

Answer

- 24. The empirical formula of a non-electrolyte is CH_2O . A solution containing 3 g of the compound exerts the same osmotic pressure as that of 0.05 M glucose solution. The molecular formula of the compound is
 - A. CH_2O
 - B. $C_2H_4O_2$
 - C. C₄H₈O₄
 - D. $C_3H_6O_3$

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A. cation

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- C. Zwitter ion
- D. covalent form

Answer

- 26. Which one of these is not true for benzene?
 - A. It forms only one type of monosubstituted product
 - B. There are three carbon-carbon single bonds and three carbon-carbon double bonds
 - C. Heat of hydrogenation of benzene is less than its theoretical value
 - D. The bond angle between carbon-carbon bonds is 120°

Answer

- 27. 1.2 g of organic compound of Kjeldahlization liberates ammonia which consumes 30 cm³ of 1 N HCI. The percentage of nitrogen in the organic compound is
 - A. 30
 - B. 35
 - C. 46.67
 - D. 20.8

Answer

- 28. Carbon cannot reduce Fe_2O_3 to Fe at a temperature below 983 K because
 - A. free energy change for the formation of CO is more negative than that of Fe_2O_3
 - B. CO is thermodynamically more stable than Fe_2O_3
 - C. carbon has higher affinity towards oxygen than iron
 - D. iron has higher affinity towards oxygen than carbon

Answer

- 29. The yellow precipitate formed during the chromyl chloride test is chemically
 - A. chromic acid
 - B. lead chromate
 - C. lead acetate
 - D. sodium chromate

Answer

- 30. Which one of the following is true?
 - A. NaOH is used in the concentration of bauxite ore
 - B. NaOH is a primary standard in volumetric analysis
 - C. Manganous hydroxide is soluble in excess of NaOH solution
 - D. NaOH solution does not react with Cl

Answer

31. Which one of the following is a covalent crystal?

A. Rock salt Like. Share. Bookmark. Download. Make Notes. Print - Your Favourite Questions. Join www.zigya.com



C. Quartz

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Answer

- 32. Which one of the nitrogen atoms in H2NI NHII CO NH2III is the most nucleophilic?
 - A. III
 - B. I
 - C. II
 - D. All three nitrogen atoms are equally strong nucleophilic centres

Answer

- 33. The maximum number of possible optical isomers in 1-bromo-2-methyl cyclobutane is
 - A. 4
 - B. 2
 - C. 8
 - D. 16

Answer

- 34. Which one of the following is the most energetic conformation of cyclohexane?
 - A. Boat
 - B. Twisted boat
 - C. Chair
 - D. Half-chair

Answer

- 35. Which one of the following is an intermediate in the reaction of benzene with CH₃Cl in the presence of anhydrous AlCl₃?
 - A. Cl⁻
 - B. CH3-
 - C. CH3+

Answer

- 36. Formic acud is a stronger acid than acetic acid. This can be explained using
 - A. +M effect
 - B. -/ effect
 - C. +1 effect
 - D. -M effect

Answer

37. The IUPAC name of



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A. but-3-enoic acid

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- B. but-1-enoic-acid
- C. pent-4-enoic acid
- D. prop-2-enoic acid

Answer

- 38. Which one of the following statements is false?
 - A. During roasting, moisture is removed from the ore
 - B. The ore is freed from almost all non-metallic impurities
 - C. Calcination of ore is carried out in the absence of any blast of air
 - D. The concentrated zinc blende is subjected to calcination during its extraction by pyrometallurgy

Answer

- 39. In chromite ore, the oxidation number of iron and chromium are respectively
 - A. +3, +2
 - B. +3, +6
 - C. +2, +6
 - D. +2, +3

Answer

- 40. The number of naturally occurring p block elements that are diamagnetic is
 - A. 18
 - B. 6
 - C. 5
 - D. 7

Answer

- 41. During the adsorption of krypton on activated charcoal at low temperature
 - A. ΔH < 0 and ΔS < 0
 - B. $\Delta H > 0$ and $\Delta S < 0$
 - C. $\Delta H > 0$ and $\Delta S > 0$
 - D. ΔH < 0 and ΔS > 0

Answer

- 42. 1 g of silver gets distributed between 10 cm³ of molten zinc and 100 cm³ of molten lead at 800°C. The percentage of silver still left in the lead layer is approximately
 - A. 2
 - B. 5
 - C. 3
 - D. 1

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43. In Ramsay and Rayleigh's isolation of noble gases from air, the nitrogen of the air is finally converted, Assignments, Solved Previous Year Papers . Questions and Answers. Free Forever.

- A. NaNO₂ only
- B. NO and NO₂
- C. $NaNO_3$ only
- D. NaNO₂ and NaNO₃

Answer

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

- A. dichloro tetraammine cobalt (III) chloride
- B. tetraammine dichloro cobalt (III) chloride
- C. tetraammine dichloro cobalt (II) chloride
- D. tetraammine dichloro cobalt (IV) chloride

Answer

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

- A. ak
- B. a2k
- C. ak
- D. 2ka

Answer

- 46. E_1 , E_2 and E_3 are the emfs of the following three galvanic cells respectively.
 - (i) Zn (s) | Zn²⁺ (0.1 M) || Cu²⁺ (1M) | Cu (s)
 - (ii) Zn (s) | Zn²⁺ (1 M) || Cu²⁺ (1M) | Cu (s)
 - (iii) Zn (s) | Zn²⁺ (1 M) || Cu²⁺ (0.1M) | Cu (s)

Which one of the following is true?

A. $E_2 > E_1 > E_3$ B. $E_1 > E_2 > E_3$ C. $E_3 > E_1 > E_2$ D. $E_3 > E_2 > E_1$

Answer

- 47. The standard emf of a galvanic cell involving 2 moles of electrons in its redox reaction is 0.59 V. The equilibrium constant for the redox reaction of the cell is
 - A. 10²⁰
 - B. 10⁵
 - C. 10

D. 10¹⁰

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48. 9.65 C of electric current is passed through fused alyhdrous MgCl₂. The magnesium metal thus Study, Assignments, Solved Previous Year Papers . Questions and Answers. Free Forever, obtained is completely converted into a Grignard reagent. The number of moles of Grignard

reagent obtained is

- A. 5×10^{-4}
- B. 1×10^{-4}
- C. 5×10^{-5}
- D. 1×10^{-5}

Answer

- 49. Which one of the following does not involve coagulation?
 - A. Clotting of blood by the use of ferric chloride
 - B. Formation of delta region
 - C. Treatment of drinking water by potash alum
 - D. Peptization

Answer

- 50. Asolution of two liquids boils at a temperature more than the boiling point of either of them. Hence, the binary solution shows
 - A. negative deviation from Raoult's law
 - B. positive deviation from Raoult's law
 - C. no deviation from Raoult's law
 - D. positive or negative deviation from Raoult's law depending upon the composition

Answer

51. Identify B and D in the following sequence of reactions



- A. methanol and bromoethane
- B. ethyl hydrogen sulphate and alcoholic KOH
- C. ethyl hydrogen sulphate and aqueous KOH
- D. ethanol and alcoholic KOH

Answer

- 52. The compound which gives turbidity immediately with Lucas reagent at room temperature is
 - A. butan-1-ol
 - B. butan-2-ol
 - C. 2-methyl propan-2-ol

D. 2-methyl propan-1-ol

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53. Ethyl benzene cannot be prepared by

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- B. Wurtz-Fittig reaction
- C. Friedel-Craft's reaction
- D. Clemmensen reduction

Answer

- 54. Which one of the following is not true for the hydrolysis of *t*-butyl bromide with aqueous NaOH?
 - A. Reaction occurs through the $\mathsf{S}_{\scriptscriptstyle N}\mathsf{1}$ mechanism
 - B. The intermediate formed is a carbocation
 - C. Rate of the reaction doubles when the concentration of alkali is doubled
 - D. Rate of the reaction doubles when the concentration of *t*-butyl bromide is doubled

Answer

55. Following is the substitution reaction in which -CN replaces -Cl.

 $R-CI + KCN(alcoholic) \rightarrow \Delta R-CN + KCI$

To obtaine propanenitrile, R-Cl should be

- A. chloroethane
- B. 1-chloropropane
- C. chloromethane
- D. 2-chloropropane

Answer

- 56. The conversion of *m*-nitrophenol to resorcinol involves respectively
 - A. hydrolysis, diazotization and reduction
 - B. diazotization, reduction and hydrolysis
 - C. hydrolysis, reduction and diazotization
 - D. reduction, diazotization and hydrolysis

Answer

- 57. The reagent with which both acetaldehyde and acetone react is
 - A. Fehling's solution
 - B. I₂/ NaOH
 - C. Tollen's reagent
 - D. carbonic acid

Answer

- 58. Which of the following gives an aldehyde on dry distillation?
 - A. Calcium formate + calcium acetate
 - B. Calcium acetate + calcium benzoate
 - C. Calcmm acetate

D. Calcium benzoate

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A. one α-D-glucopyranose unit and one β-D-glucopyranose unit with 1-2 glycosidic Study Assignments, Solved Previous Year Papers . Questions and Answers. Free Forever.

- B. two α -D-glucopyranose units with 1-2 glycosidic linkage
- C. two β -D-glucopyranose unit with 1-4 glycosidic linkage.
- D. two α -D-glucopyranose units with 1-4 glycosidic linkage

Answer

- 60. Which one of the following does not correctly match with each other?
 - A. Silk-polyamide
 - B. Lipase enzyme
 - C. Butter fat
 - D. oxytocin-enzyme

Answer