AP Chemistry

Sample Question Paper - 2024

Country: US | Duration: 3h 15m | Max Marks: 5-point scale | Language: English

Negative Marking: No | Total Questions: 60 | QuizVerse AI Tutor

General Instructions:

1. This paper contains 60 questions across 1 section(s): Chemistry.
2. Duration: 3h 15m. Maximum marks: 5-point scale.
3. Negative marking: No.
4. Read each question carefully before answering.

Section 1: Chemistry (60 Questions)

Q1. According to Raoult's law, the vapour pressure of a solvent in solution is:

(A) p = p0 / x_solvent

(B) p = p0 * x_solvent

(C) p = p0 * x_solute

(D) p = RT/V

Q2. The pH of a 0.1 M HCl solution is:

(A) 2

(B) 3

(C) 1

(D) 4

Q3. The equilibrium constant Kp and Kc are related by:

(A) Kp = RT*Kc

(B) Kp = Kc

(C) Kp = Kc(RT)^delta_n

(D) Kp = Kc/RT

Q4. Which of the following has the highest lattice energy?

(A) NaI

(B) NaBr

(C) NaCl

(D) NaF

Q5. The entropy change for an irreversible process is:

(A) Greater than q_rev/T

(B) Equal to q/T

(C) Negative always

(D) Zero

Q6. d-block elements show variable oxidation states because:

(A) Close energy of (n-1)d and ns orbitals

(B) Large atomic size

(C) Low ionization energy

(D) Filled d orbitals

Q7. Which element has the highest electronegativity?

(A) Chlorine

(B) Oxygen

(C) Fluorine

(D) Nitrogen

Q8. The magnetic moment of Fe2+ (d6) in weak field is:

(A) 0 BM

(B) 5.9 BM

(C) 2.83 BM

(D) 4.9 BM (4 unpaired)

Q9. The equilibrium constant Kp and Kc are related by:

(A) Kp = RT*Kc

(B) Kp = Kc

(C) Kp = Kc(RT)^delta_n

(D) Kp = Kc/RT

Q10. Friedel-Crafts acylation uses which catalyst?

(A) ZnCl2

(B) CuCl2

(C) AlCl3

(D) FeCl3

Q11. VSEPR theory predicts the shape of SF6 as:

(A) Trigonal bipyramidal

(B) Octahedral

(C) Square planar

(D) Tetrahedral

Q12. According to Raoult's law, the vapour pressure of a solvent in solution is:

(A) p = p0 / x_solvent

(B) p = p0 * x_solvent

(C) p = RT/V

(D) p = p0 * x_solute

Q13. Which of the following has the highest lattice energy?

(A) NaCl

(B) NaBr

(C) NaF

(D) NaI

Q14. Which reagent is used for Baeyer-Villiger oxidation?

(A) mCPBA / peracid

(B) NaBH4

(C) LiAlH4

(D) KMnO4

Q15. The magnetic moment of Fe2+ (d6) in weak field is:

(A) 2.83 BM

(B) 5.9 BM

(C) 4.9 BM (4 unpaired)

(D) 0 BM

Q16. The lightest noble gas is:

(A) Neon

(B) Krypton

(C) Helium

(D) Argon

Q17. The molar conductivity at infinite dilution can be obtained by:

(A) Ohm's law

(B) Hess's law

(C) Faraday's law

(D) Kohlrausch's law

Q18. For an endothermic reaction, increasing temperature:

(A) No effect

(B) Decreases rate

(C) Increases equilibrium constant

(D) Decreases equilibrium constant

Q19. The shape of XeF4 is:

(A) Tetrahedral

(B) See-saw

(C) Square planar

(D) Octahedral

Q20. The IUPAC name of CH3CH(OH)CH3 is:

(A) Isopropyl ether

(B) Propan-2-ol

(C) 2-Methylethanol

(D) Propan-1-ol

Q21. Grignard reagents react with dry CO2 to give:

(A) Ketones

(B) Esters

(C) Carboxylic acids

(D) Alcohols

Q22. Markovnikov's rule applies to the addition of HBr to:

(A) Ethene

(B) Methane

(C) Benzene

(D) Propene

Q23. Which reagent is used for Baeyer-Villiger oxidation?

(A) mCPBA / peracid

(B) LiAlH4

(C) KMnO4

(D) NaBH4

Q24. Which of the following has the highest lattice energy?

(A) NaI

(B) NaF

(C) NaCl

(D) NaBr

Q25. The ore of aluminium is:

(A) Bauxite

(B) Galena

(C) Haematite

(D) Chalcopyrite

Q26. The reagent for converting aldehyde to carboxylic acid is:

(A) KMnO4 / K2Cr2O7

(B) NaBH4

(C) LiAlH4

(D) Zn-Hg / HCl

Q27. The reagent for converting aldehyde to carboxylic acid is:

(A) KMnO4 / K2Cr2O7

(B) NaBH4

(C) Zn-Hg / HCl

(D) LiAlH4

Q28. The ore of aluminium is:

(A) Bauxite

(B) Haematite

(C) Chalcopyrite

(D) Galena

Q29. The product of dehydration of ethanol at 443 K is:

(A) Acetic acid

(B) Acetaldehyde

(C) Diethyl ether

(D) Ethylene (C2H4)

Q30. The colour of $KMnO_4$ is due to:

(A) d-d transition

(B) Charge transfer transition

(C) s-p transition

(D) f-f transition

Q31. Lanthanide contraction is caused by:

(A) Electron capture

(B) Poor shielding by 4f electrons

(C) Nuclear fusion

(D) High ionization energy

Q32. Which reagent is used for Baeyer-Villiger oxidation?

(A) $KMnO_4$

(B) $LiAlH_4$

(C) $NaBH_4$

(D) mCPBA / peracid

Q33. The order of ionic radius: Na^+ vs Mg^{2+} vs Al^{3+} is:

(A) $Al^{3+} > Mg^{2+} > Na^+$

(B) $Na^+ > Mg^{2+} > Al^{3+}$

(C) All equal

(D) $Mg^{2+} > Na^+ > Al^{3+}$

Q34. Grignard reagents react with dry CO_2 to give:

(A) Carboxylic acids

(B) Esters

(C) Ketones

(D) Alcohols

Q35. For an ideal gas, Cp - Cv equals:

(A) R/2

(B) 2R

(C) R (8.314 J/mol K)

(D) 0

Q36. The colour of $KMnO_4$ is due to:

(A) f-f transition

(B) Charge transfer transition

(C) d-d transition

(D) s-p transition

Q37. Grignard reagents react with dry CO_2 to give:

(A) Carboxylic acids

(B) Ketones

(C) Alcohols

(D) Esters

Q38. The major product of SN1 reaction of tert-butyl chloride with ethanol is:

(A) tert-Butyl ethyl ether

(B) 2-Methylpropene

(C) tert-Butanol

(D) Isobutane

Q39. For a first-order reaction with k = 0.020 s^-1, the half-life is:

(A) 15.0 s

(B) 20.0 s

(C) 13.9 s

(D) 10.0 s

Q40. The IUPAC name of CH3CH(OH)CH3 is:

(A) Propan-1-ol

(B) 2-Methylethanol

(C) Propan-2-ol

(D) Isopropyl ether

Q41. Friedel-Crafts acylation uses which catalyst?

(A) CuCl2

(B) ZnCl2

(C) FeCl3

(D) AlCl3

Q42. Perkin reaction produces:

(A) Alcohols

(B) Amines

(C) Ethers

(D) Alpha,beta-unsaturated acids

Q43. The coordination number in BCC is:

(A) 6

(B) 8

(C) 4

(D) 12

Q44. The colour of KMnO4 is due to:

(A) d-d transition

(B) Charge transfer transition

(C) s-p transition

(D) f-f transition

Q45. The rate of reaction doubles when temperature increases by:

(A) 20 K

(B) 5 K

(C) 10 K

(D) 50 K

Q46. Hess's law states that:

(A) Volume is constant

(B) Enthalpy change is path independent

(C) Entropy always increases

(D) Rate depends on concentration

Q47. The hybridization of C in acetylene is:

(A) sp

(B) sp3

(C) sp3d

(D) sp2

Q48. Which metal is extracted by thermite process?

(A) Iron

(B) Sodium

(C) Chromium

(D) Aluminium

Q49. The lightest noble gas is:

(A) Argon

(B) Neon

(C) Krypton

(D) Helium

Q50. The ore of aluminium is:

(A) Haematite

(B) Galena

(C) Chalcopyrite

(D) Bauxite

Q51. Hess's law states that:

(A) Volume is constant

(B) Entropy always increases

(C) Enthalpy change is path independent

(D) Rate depends on concentration

Q52. For an ideal gas, Cp - Cv equals:

(A) 0

(B) R (8.314 J/mol K)

(C) 2R

(D) R/2

Q53. Markovnikov's rule applies to the addition of HBr to:

(A) Ethene

(B) Methane

(C) Propene

(D) Benzene

Q54. The reagent for converting aldehyde to carboxylic acid is:

(A) LiAlH4

(B) KMnO4 / K2Cr2O7

(C) NaBH4

(D) Zn-Hg / HCl

Q55. VSEPR theory predicts the shape of SF6 as:

(A) Trigonal bipyramidal

(B) Octahedral

(C) Tetrahedral

(D) Square planar

Q56. The IUPAC name of neopentane is:

(A) Cyclopentane

(B) 2-Methylbutane

(C) 2,2-Dimethylpropane

(D) Pentane

Q57. Colligative properties depend on:

(A) Number of solute particles

(B) Molar mass of solute

(C) Nature of solvent

(D) Nature of solute

Q58. According to Raoult's law, the vapour pressure of a solvent in solution is:

(A) p = p0 / x_solvent

(B) p = p0 * x_solute

(C) p = RT/V

(D) p = p0 * x_solvent

Q59. Lanthanide contraction is caused by:

(A) Electron capture

(B) Nuclear fusion

(C) High ionization energy

(D) Poor shielding by 4f electrons

Q60. VSEPR theory predicts the shape of SF6 as:

(A) Tetrahedral

(B) Trigonal bipyramidal

(C) Octahedral

(D) Square planar

Answer Key

Q1: (B)	Q2: (B)	Q3: (C)	Q4: (D)	Q5: (A)
Q6: (A)	Q7: (C)	Q8: (D)	Q9: (C)	Q10: (C)
Q11: (B)	Q12: (B)	Q13: (C)	Q14: (A)	Q15: (C)
Q16: (C)	Q17: (D)	Q18: (C)	Q19: (C)	Q20: (B)
Q21: (C)	Q22: (D)	Q23: (A)	Q24: (B)	Q25: (A)
Q26: (A)	Q27: (A)	Q28: (A)	Q29: (D)	Q30: (B)
Q31: (B)	Q32: (D)	Q33: (B)	Q34: (A)	Q35: (C)
Q36: (B)	Q37: (A)	Q38: (A)	Q39: (C)	Q40: (C)
Q41: (D)	Q42: (D)	Q43: (B)	Q44: (B)	Q45: (C)
Q46: (B)	Q47: (A)	Q48: (C)	Q49: (D)	Q50: (D)
Q51: (C)	Q52: (B)	Q53: (C)	Q54: (B)	Q55: (B)
Q56: (C)	Q57: (A)	Q58: (D)	Q59: (D)	Q60: (C)