AP Chemistry

Sample Question Paper - 2025

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

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

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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. Gibbs free energy change for a spontaneous process is:

(A) Undefined

(B) Positive

(C) Zero

(D) Negative

Q2. The colour of KMnO4 is due to:

(A) s-p transition

(B) f-f transition

(C) Charge transfer transition

(D) d-d transition

Q3. Which reagent is used for Baeyer-Villiger oxidation?

(A) mCPBA / peracid

(B) NaBH4

(C) KMnO4

(D) LiAlH4

Q4. Grignard reagents react with dry CO2 to give:

(A) Alcohols

(B) Esters

(C) Ketones

(D) Carboxylic acids

Q5. The rate of reaction doubles when temperature increases by:

(A) 10 K

(B) 20 K

(C) 5 K

(D) 50 K

Q6. The major product of SN1 reaction of tert-butyl chloride with ethanol is:

(A) 2-Methylpropene

(B) Isobutane

(C) tert-Butanol

(D) tert-Butyl ethyl ether

Q7. The hybridization of C in acetylene is:

(A) sp3

(B) sp

(C) sp3d

(D) sp2

Q8. The rate of reaction doubles when temperature increases by:

(A) 50 K

(B) 20 K

(C) 5 K

(D) 10 K

Q9. The hybridization of Ni in [Ni(CN)4]2- is:

(A) sp3

(B) d2sp3

(C) sp3d

(D) dsp2

Q10. The hybridization of Ni in [Ni(CN)4]2- is:

(A) dsp2

(B) d2sp3

(C) sp3d

(D) sp3

Q11. Which of the following has the highest lattice energy?

(A) NaI

(B) NaCl

(C) NaF

(D) NaBr

Q12. The IUPAC name of CH3CH(OH)CH3 is:

(A) Propan-1-ol

(B) Isopropyl ether

(C) Propan-2-ol

(D) 2-Methylethanol

Q13. The cell potential for Zn|Zn2+||Cu2+|Cu cell is:

(A) 0.34 V

(B) 0.76 V

(C) -0.76 V

(D) 1.10 V

Q14. The product of dehydration of ethanol at 443 K is:

(A) Ethylene (C2H4)

(B) Acetaldehyde

(C) Diethyl ether

(D) Acetic acid

Q15. For a first-order reaction with k = 0.020 s^-1, the half-life is:

(A) 10.0 s

(B) 15.0 s

(C) 13.9 s

(D) 20.0 s

Q16. The entropy change for an irreversible process is:

(A) Negative always

(B) Zero

(C) Equal to q/T

(D) Greater than q_rev/T

Q17. Grignard reagents react with dry CO2 to give:

(A) Esters

(B) Carboxylic acids

(C) Alcohols

(D) Ketones

Q18. The reagent for converting aldehyde to carboxylic acid is:

(A) LiAlH4

(B) KMnO4 / K2Cr2O7

(C) Zn-Hg / HCl

(D) NaBH4

Q19. VSEPR theory predicts the shape of SF6 as:

(A) Square planar

(B) Tetrahedral

(C) Trigonal bipyramidal

(D) Octahedral

Q20. The equilibrium constant Kp and Kc are related by:

(A) Kp = Kc/RT

(B) Kp = RT*Kc

(C) Kp = Kc

(D) Kp = Kc(RT)^delta_n

Q21. Perkin reaction produces:

(A) Alpha,beta-unsaturated acids

(B) Ethers

(C) Alcohols

(D) Amines

Q22. Wurtz reaction involves coupling of:

(A) Alkyl halides with Na

(B) Aryl halides with Cu

(C) Aldehydes with NaOH

(D) Acids with SOCl2

Q23. The ore of aluminium is:

(A) Chalcopyrite

(B) Haematite

(C) Galena

(D) Bauxite

Q24. The magnetic moment of Fe2+ (d6) in weak field is:

(A) 5.9 BM

(B) 4.9 BM (4 unpaired)

(C) 2.83 BM

(D) 0 BM

Q25. Lanthanide contraction is caused by:

(A) Nuclear fusion

(B) High ionization energy

(C) Poor shielding by 4f electrons

(D) Electron capture

Q26. For an endothermic reaction, increasing temperature:

(A) No effect

(B) Decreases equilibrium constant

(C) Increases equilibrium constant

(D) Decreases rate

Q27. The shape of XeF4 is:

(A) Square planar

(B) See-saw

(C) Octahedral

(D) Tetrahedral

Q28. The crystal field splitting energy in octahedral complex is:

(A) Delta_oct

(B) Delta_sq

(C) Delta_tet

(D) 10Dq_tet

Q29. Wurtz reaction involves coupling of:

(A) Aryl halides with Cu

(B) Alkyl halides with Na

(C) Acids with SOCl2

(D) Aldehydes with NaOH

Q30. The crystal field splitting energy in octahedral complex is:

(A) Delta_oct

(B) Delta_sq

(C) 10Dq_tet

(D) Delta_tet

Q31. The product of dehydration of ethanol at 443 K is:

(A) Acetic acid

(B) Ethylene (C2H4)

(C) Diethyl ether

(D) Acetaldehyde

Q32. The colour of KMnO4 is due to:

(A) d-d transition

(B) s-p transition

(C) Charge transfer transition

(D) f-f transition

Q33. Which test distinguishes aldehydes from ketones?

(A) Lassaigne test

(B) Tollens' test (silver mirror)

(C) Lucas test

(D) Beilstein test

Q34. Perkin reaction produces:

(A) Alcohols

(B) Ethers

(C) Amines

(D) Alpha,beta-unsaturated acids

Q35. Colligative properties depend on:

(A) Nature of solvent

(B) Nature of solute

(C) Molar mass of solute

(D) Number of solute particles

Q36. The IUPAC name of CH3CH(OH)CH3 is:

(A) Propan-1-ol

(B) Isopropyl ether

(C) Propan-2-ol

(D) 2-Methylethanol

Q37. For an ideal gas, Cp - Cv equals:

(A) R/2

(B) 2R

(C) 0

(D) R (8.314 J/mol K)

Q38. The cell potential for Zn|Zn2+||Cu2+|Cu cell is:

(A) 1.10 V

(B) -0.76 V

(C) 0.76 V

(D) 0.34 V

Q39. The crystal field splitting energy in octahedral complex is:

(A) Delta_sq

(B) Delta_tet

(C) Delta_oct

(D) 10Dq_tet

Q40. The pH of a 0.1 M HCl solution is:

(A) 1

(B) 2

(C) 4

(D) 3

Q41. For a first-order reaction with k = 0.020 s^-1, the half-life is:

(A) 15.0 s

(B) 13.9 s

(C) 20.0 s

(D) 10.0 s

Q42. The shape of XeF4 is:

(A) Square planar

(B) See-saw

(C) Tetrahedral

(D) Octahedral

Q43. Markovnikov's rule applies to the addition of HBr to:

(A) Methane

(B) Propene

(C) Benzene

(D) Ethene

Q44. The colour of KMnO4 is due to:

(A) Charge transfer transition

(B) f-f transition

(C) d-d transition

(D) s-p transition

Q45. 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

Q46. The molar conductivity at infinite dilution can be obtained by:

(A) Kohlrausch's law

(B) Hess's law

(C) Ohm's law

(D) Faraday's law

Q47. For an endothermic reaction, increasing temperature:

(A) Increases equilibrium constant

(B) No effect

(C) Decreases rate

(D) Decreases equilibrium constant

Q48. The hybridization of C in acetylene is:

(A) sp

(B) sp2

(C) sp3

(D) sp3d

Q49. The IUPAC name of neopentane is:

(A) 2,2-Dimethylpropane

(B) 2-Methylbutane

(C) Cyclopentane

(D) Pentane

Q50. The entropy change for an irreversible process is:

(A) Equal to q/T

(B) Greater than q_rev/T

(C) Zero

(D) Negative always

Q51. Williamson's synthesis is used to prepare:

(A) Esters

(B) Ethers

(C) Alcohols

(D) Amines

Q52. The equilibrium constant Kp and Kc are related by:

(A) Kp = Kc(RT)^delta_n

(B) Kp = Kc

(C) Kp = RT*Kc

(D) Kp = Kc/RT

Q53. Which element has the highest electronegativity?

(A) Fluorine

(B) Chlorine

(C) Oxygen

(D) Nitrogen

Q54. Kolbe's electrolysis of sodium acetate gives:

(A) Propane

(B) Methane

(C) Butane

(D) Ethane

Q55. The reagent for converting aldehyde to carboxylic acid is:

(A) KMnO4 / K2Cr2O7

(B) Zn-Hg / HCl

(C) LiAlH4

(D) NaBH4

Q56. According to Raoult's law, the vapour pressure of a solvent in solution is:

(A) p = RT/V

(B) p = p0 * x_solute

(C) p = p0 * x_solvent

(D) p = p0 / x_solvent

Q57. The order of ionic radius: Na+ vs Mg2+ vs Al3+ is:

(A) Al3+ > Mg2+ > Na+

(B) All equal

(C) Na+ > Mg2+ > Al3+

(D) Mg2+ > Na+ > Al3+

Q58. Hess's law states that:

(A) Volume is constant

(B) Rate depends on concentration

(C) Enthalpy change is path independent

(D) Entropy always increases

Q59. Colligative properties depend on:

(A) Molar mass of solute

(B) Number of solute particles

(C) Nature of solvent

(D) Nature of solute

Q60. The equilibrium constant Kp and Kc are related by:

(A) Kp = Kc

(B) Kp = Kc(RT)^delta_n

(C) Kp = RT*Kc

(D) Kp = Kc/RT

Answer Key

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