

AP Chemistry

Sample Question Paper - 2022

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. The reagent for converting aldehyde to carboxylic acid is:

- (A) $\text{KMnO}_4 / \text{K}_2\text{Cr}_2\text{O}_7$
- (B) $\text{Zn-Hg} / \text{HCl}$
- (C) NaBH_4
- (D) LiAlH_4

Q2. Which test distinguishes aldehydes from ketones?

- (A) Beilstein test
- (B) Lassaigne test
- (C) Tollens' test (silver mirror)
- (D) Lucas test

Q3. Which metal is extracted by thermite process?

- (A) Sodium
- (B) Aluminium
- (C) Iron
- (D) Chromium

Q4. The molar conductivity at infinite dilution can be obtained by:

- (A) Faraday's law
- (B) Ohm's law
- (C) Kohlrausch's law
- (D) Hess's law

Q5. The ore of aluminium is:

- (A) Bauxite
- (B) Galena
- (C) Chalcopyrite
- (D) Haematite

Q6. Gibbs free energy change for a spontaneous process is:

- (A) Positive
- (B) Negative
- (C) Zero
- (D) Undefined

Q7. Wurtz reaction involves coupling of:

- (A) Acids with SOCl_2
- (B) Alkyl halides with Na
- (C) Aldehydes with NaOH
- (D) Aryl halides with Cu

Q8. d-block elements show variable oxidation states because:

- (A) Large atomic size
- (B) Low ionization energy
- (C) Close energy of $(n-1)d$ and ns orbitals
- (D) Filled d orbitals

Q9. The rate of reaction doubles when temperature increases by:

- (A) 10 K
- (B) 20 K
- (C) 50 K
- (D) 5 K

Q10. For a first-order reaction with $k = 0.020 \text{ s}^{-1}$, the half-life is:

- (A) 15.0 s
- (B) 20.0 s
- (C) 13.9 s
- (D) 10.0 s

Q11. The coordination number in BCC is:

- (A) 4
- (B) 8
- (C) 6
- (D) 12

Q12. Which reagent is used for Baeyer-Villiger oxidation?

- (A) mCPBA / peracid
- (B) KMnO_4
- (C) NaBH_4
- (D) LiAlH_4

Q13. Grignard reagents react with dry CO_2 to give:

- (A) Alcohols
- (B) Ketones
- (C) Esters
- (D) Carboxylic acids

Q14. The hybridization of Ni in $[\text{Ni}(\text{CN})_4]^{2-}$ is:

- (A) dsp^2
- (B) sp^3
- (C) sp^3d
- (D) d^2sp^3

Q15. The order of ionic radius: Na^+ vs Mg^{2+} vs Al^{3+} is:

- (A) $\text{Na}^+ > \text{Mg}^{2+} > \text{Al}^{3+}$
- (B) All equal
- (C) $\text{Al}^{3+} > \text{Mg}^{2+} > \text{Na}^+$
- (D) $\text{Mg}^{2+} > \text{Na}^+ > \text{Al}^{3+}$

Q16. The equilibrium constant K_p and K_c are related by:

- (A) $K_p = K_c/RT$
- (B) $K_p = K_c$
- (C) $K_p = K_c(RT)^{\Delta n}$
- (D) $K_p = RT \cdot K_c$

Q17. The van't Hoff factor for NaCl is approximately:

- (A) 3
- (B) 0.5
- (C) 2
- (D) 1

Q18. Grignard reagents react with dry CO_2 to give:

- (A) Alcohols
- (B) Ketones
- (C) Esters
- (D) Carboxylic acids

Q19. The lightest noble gas is:

- (A) Helium
- (B) Neon
- (C) Argon
- (D) Krypton

Q20. The van't Hoff factor for NaCl is approximately:

- (A) 0.5
- (B) 1
- (C) 2
- (D) 3

Q21. The molar conductivity at infinite dilution can be obtained by:

- (A) Faraday's law
- (B) Hess's law
- (C) Ohm's law
- (D) Kohlrausch's law

Q22. The osmotic pressure of a solution is given by:

- (A) $\pi = PV$
- (B) $\pi = mRT$
- (C) $\pi = iMRT$
- (D) $\pi = nRT/V$

Q23. Markovnikov's rule applies to the addition of HBr to:

- (A) Benzene
- (B) Ethene
- (C) Methane
- (D) Propene

Q24. The ore of aluminium is:

- (A) Galena
- (B) Chalcopyrite
- (C) Haematite
- (D) Bauxite

Q25. The van't Hoff factor for NaCl is approximately:

- (A) 2
- (B) 1
- (C) 0.5
- (D) 3

Q26. The rate of reaction doubles when temperature increases by:

- (A) 5 K
- (B) 50 K
- (C) 10 K
- (D) 20 K

Q27. The IUPAC name of neopentane is:

- (A) Cyclopentane
- (B) 2-Methylbutane
- (C) 2,2-Dimethylpropane
- (D) Pentane

Q28. The cell potential for $Zn|Zn^{2+}||Cu^{2+}|Cu$ cell is:

- (A) 0.76 V
- (B) -0.76 V
- (C) 0.34 V
- (D) 1.10 V

Q29. Perkin reaction produces:

- (A) Alpha,beta-unsaturated acids
- (B) Ethers
- (C) Amines
- (D) Alcohols

Q30. The major product of SN1 reaction of tert-butyl chloride with ethanol is:

- (A) 2-Methylpropene
- (B) Isobutane
- (C) tert-Butyl ethyl ether
- (D) tert-Butanol

Q31. The colour of KMnO₄ is due to:

- (A) d-d transition
- (B) Charge transfer transition
- (C) f-f transition
- (D) s-p transition

Q32. The lightest noble gas is:

- (A) Argon
- (B) Krypton
- (C) Neon
- (D) Helium

Q33. For an endothermic reaction, increasing temperature:

- (A) Increases equilibrium constant
- (B) Decreases equilibrium constant
- (C) Decreases rate
- (D) No effect

Q34. Markovnikov's rule applies to the addition of HBr to:

- (A) Ethene
- (B) Propene
- (C) Methane
- (D) Benzene

Q35. VSEPR theory predicts the shape of SF₆ as:

- (A) Square planar
- (B) Trigonal bipyramidal
- (C) Tetrahedral
- (D) Octahedral

Q36. The reagent for converting aldehyde to carboxylic acid is:

- (A) LiAlH₄
- (B) Zn-Hg / HCl
- (C) KMnO₄ / K₂Cr₂O₇
- (D) NaBH₄

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

- (A) R/2
- (B) 2R
- (C) R (8.314 J/mol K)
- (D) 0

Q38. Which of the following has the highest lattice energy?

- (A) NaBr
- (B) NaCl
- (C) NaF
- (D) NaI

Q39. The hybridization of C in acetylene is:

- (A) sp^3d
- (B) sp^3
- (C) sp
- (D) sp^2

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

- (A) 4
- (B) 3
- (C) 1
- (D) 2

Q41. The major product of S_N1 reaction of tert-butyl chloride with ethanol is:

- (A) 2-Methylpropene
- (B) tert-Butanol
- (C) tert-Butyl ethyl ether
- (D) Isobutane

Q42. Hess's law states that:

- (A) Volume is constant
- (B) Rate depends on concentration
- (C) Enthalpy change is path independent
- (D) Entropy always increases

Q43. Which reagent is used for Baeyer-Villiger oxidation?

- (A) mCPBA / peracid
- (B) $KMnO_4$
- (C) $NaBH_4$
- (D) $LiAlH_4$

Q44. Which element has the highest electronegativity?

- (A) Chlorine
- (B) Nitrogen
- (C) Oxygen
- (D) Fluorine

Q45. The lightest noble gas is:

- (A) Argon
- (B) Krypton
- (C) Neon
- (D) Helium

Q46. The equilibrium constant K_p and K_c are related by:

- (A) $K_p = K_c/RT$
- (B) $K_p = RT \cdot K_c$
- (C) $K_p = K_c$
- (D) $K_p = K_c(RT)^{\Delta n}$

Q47. Lanthanide contraction is caused by:

- (A) Electron capture
- (B) High ionization energy
- (C) Nuclear fusion
- (D) Poor shielding by 4f electrons

Q48. Markovnikov's rule applies to the addition of HBr to:

- (A) Propene
- (B) Ethene
- (C) Benzene
- (D) Methane

Q49. Gibbs free energy change for a spontaneous process is:

- (A) Negative
- (B) Positive
- (C) Zero
- (D) Undefined

Q50. The reagent for converting aldehyde to carboxylic acid is:

- (A) NaBH_4
- (B) LiAlH_4
- (C) $\text{KMnO}_4 / \text{K}_2\text{Cr}_2\text{O}_7$
- (D) $\text{Zn-Hg} / \text{HCl}$

Q51. Friedel-Crafts acylation uses which catalyst?

- (A) FeCl_3
- (B) AlCl_3
- (C) ZnCl_2
- (D) CuCl_2

Q52. VSEPR theory predicts the shape of SF_6 as:

- (A) Trigonal bipyramidal
- (B) Tetrahedral
- (C) Octahedral
- (D) Square planar

Q53. According to Raoult's law, the vapour pressure of a solvent in solution is:

- (A) $p = RT/V$
- (B) $p = p_0 / x_{\text{solvent}}$
- (C) $p = p_0 \cdot x_{\text{solute}}$
- (D) $p = p_0 \cdot x_{\text{solvent}}$

Q54. The product of dehydration of ethanol at 443 K is:

- (A) Acetic acid
- (B) Acetaldehyde
- (C) Ethylene (C₂H₄)
- (D) Diethyl ether

Q55. The product of dehydration of ethanol at 443 K is:

- (A) Diethyl ether
- (B) Acetaldehyde
- (C) Ethylene (C₂H₄)
- (D) Acetic acid

Q56. Colligative properties depend on:

- (A) Molar mass of solute
- (B) Number of solute particles
- (C) Nature of solvent
- (D) Nature of solute

Q57. The rate of reaction doubles when temperature increases by:

- (A) 5 K
- (B) 20 K
- (C) 50 K
- (D) 10 K

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

- (A) $p = p_0 / x_{\text{solvent}}$
- (B) $p = p_0 * x_{\text{solvent}}$
- (C) $p = RT/V$
- (D) $p = p_0 * x_{\text{solute}}$

Q59. According to Raoult's law, the vapour pressure of a solvent in solution is:

- (A) $p = RT/V$
- (B) $p = p_0 * x_{\text{solute}}$
- (C) $p = p_0 * x_{\text{solvent}}$
- (D) $p = p_0 / x_{\text{solvent}}$

Q60. Perkin reaction produces:

- (A) Alcohols
- (B) Ethers
- (C) Alpha,beta-unsaturated acids
- (D) Amines

Answer Key

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

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