

NEET Chemistry Sample Paper 01

A) Subject: Chemistry

B) Total Questions: 45 Questions (All Compulsory)

C) Marking Scheme & Rules:

- Correct Answer: +4 marks
- Incorrect Answer: -1 mark (Negative marking)
- Unattempted Question: 0 marks
- Multiple Answers: Treated as incorrect, attracting -1 mark

Q1. Enthalpy of combustion of graphite and diamond are -393.5 and -395.4 kJ/mol. The ΔH for Graphite \rightarrow Diamond is:

- A. $+1.9$ kJ/mol
- B. -1.9 kJ/mol
- C. $+2.5$ kJ/mol
- D. -2.5 kJ/mol

Q2. Enthalpy of neutralization of acetic acid by NaOH is -50.6 kJ/mol. If strong acid neutralization is -55.9 kJ/mol, ΔH of ionization of CH_3COOH is:

- A. $+5.3$ kJ/mol
- B. -5.3 kJ/mol
- C. $+106.5$ kJ/mol
- D. -106.5 kJ/mol

Q3. An ideal gas expands isothermally from 10^{-3} m³ to 10^{-2} m³ against a constant pressure of 10^5 N/m². Work done is:

- A. -900 J
- B. $+900$ J
- C. -900 kJ
- D. $+270$ kJ

Q4. Which of the following shows $\Delta S < 0$?

- A. $H_2(g) \rightarrow 2H(g)$
- B. $N_2(1 \text{ atm}) \rightarrow N_2(8 \text{ atm})$
- C. $2SO_3(g) \rightarrow 2SO_2(g) + O_2(g)$
- D. Sublimation of dry ice

Q5. Volume of 0.2 N NaOH required to neutralize 100 mL of 0.5 N H_2SO_4 :

- A. 100 mL
- B. 200 mL
- C. 250 mL
- D. 500 mL

Q6. Vapour pressure of 0.5 M glucose solution is:

- A. Equal to 0.5 M NaCl
- B. Higher than 0.5 M NaCl

- C. Lower than 0.5 M NaCl
D. Higher than pure water
- Q7.** For a first order reaction, the half-life period is:
A. Proportional to $[A]_0$
B. Inversely proportional to $[A]_0$
C. Independent of $[A]_0$
D. Proportional to square of $[A]_0$
- Q8.** In the reaction $N_2 + 3H_2 \rightleftharpoons 2NH_3 + \text{heat}$, maximum yield is at:
A. High T, High P
B. Low T, Low P
C. Low T, High P
D. High T, Low P
- Q9.** Unit of rate constant for a zero order reaction:
A. $\text{mol L}^{-1} \text{s}^{-1}$
B. s^{-1}
C. $\text{L mol}^{-1} \text{s}^{-1}$
D. mol L s^{-1}
- Q10.** The pH of 10^{-8} M HCl is:
A. 8
B. 7
C. 6.98
D. 1.0
- Q11.** Molality of pure water is:
A. 55.5 m
B. 18 m
C. 100 m
D. 1 m
- Q12.** During the electrolysis of molten NaCl, the product at the anode is:
A. Na metal
B. H_2 gas
C. Cl_2 gas
D. O_2 gas
- Q13.** Which has maximum number of atoms?
A. 1g Ag
B. 1g Mg
C. 1g O_2
D. 1g Li
- Q14.** If E_{cell} is negative, then ΔG is:
A. Positive, non-spontaneous
B. Negative, spontaneous
C. Zero, equilibrium
D. Positive, spontaneous

- Q15.** Number of radial nodes in 3p orbital:
- A. 0
 - B. 1
 - C. 2
 - D. 3
- Q16.** The correct order of electron gain enthalpy (magnitude) for halogens is:
- A. F \lt Cl \lt Br \lt I
 - B. Cl \lt F \lt Br \lt I
 - C. I \lt Br \lt Cl \lt F
 - D. F \lt Br \lt Cl \lt I
- Q17.** Geometry of XeF_4 is:
- A. Tetrahedral
 - B. Square Planar
 - C. Octahedral
 - D. Pyramidal
- Q18.** Which of the following is diamagnetic?
- A. Cu^{2+}
 - B. Fe^{3+}
 - C. Zn^{2+}
 - D. Ni^{2+}
- Q19.** Oxidation state of Cr in $K_2Cr_2O_7$:
- A. +3
 - B. +6
 - C. +7
 - D. +5
- Q20.** Hybridization of P in PCl_5 is:
- A. sp^3
 - B. sp^3d
 - C. sp^3d^2
 - D. dsp^2
- Q21.** Bond order of O_2^+ is:
- A. 2
 - B. 2.5
 - C. 1.5
 - D. 3
- Q22.** Strongest reducing agent among the following is:
- A. NH_3
 - B. PH_3
 - C. AsH_3
 - D. BiH_3
- Q23.** The ligand 'en' (ethylenediamine) is:
- A. Monodentate

- B. Bidentate
C. Tridentate
D. Hexadentate
- Q24.** Lanthanoid contraction is due to poor shielding of:
A. 4f electrons
B. 5d electrons
C. 3d electrons
D. 6s electrons
- Q25.** IUPAC name of $[Co(NH_3)_5Cl]Cl_2$:
A. Pentaamminechlorocobalt(III) chloride
B. Pentaamminechloridocobalt(III) chloride
C. Chloropentaamminecobalt(II) chloride
D. Pentaamminecobalt(III) trichloride
- Q26.** Amphoteric oxide is:
A. Na_2O
B. Al_2O_3
C. CO_2
D. CaO
- Q27.** Shape of ClF_3 is:
A. T-shape
B. Trigonal Planar
C. Trigonal Pyramidal
D. Bent
- Q28.** Most stable oxidation state of Thallium (Tl) is +1 due to:
A. Inert pair effect
B. Shielding effect
C. Diagonal relationship
D. Resonance
- Q29.** Splitting of d-orbitals in octahedral field, the orbitals with higher energy are:
A. t_{2g}
B. e_g
C. d_{xy}, d_{yz}
D. s-orbitals
- Q30.** Catalyst used in Contact Process for H_2SO_4 manufacture:
A. Fe
B. V_2O_5
C. Pt
D. Ni
- Q31.** Most stable carbocation is:
A. Methyl
B. Ethyl
C. Isopropyl

- D. Tert-butyl
- Q32.** Reaction of CH_3MgBr with Acetone gives:
- 1-propanol
 - 2-propanol
 - 2-methyl-2-propanol
 - Ethanol
- Q33.** IUPAC name of $CH_3 - CH(Cl) - CH(OH) - CH_3$:
- 2-chloro-3-butanol
 - 3-chloro-2-butanol
 - 3-chlorobutan-2-ol
 - 2-chlorobutan-3-ol
- Q34.** Reimer-Tiemann reaction converts Phenol to:
- Salicylic acid
 - Salicylaldehyde
 - Benzaldehyde
 - Chlorobenzene
- Q35.** Which doesn't give Aldol condensation?
- Acetaldehyde
 - Propanal
 - Benzaldehyde
 - Acetone
- Q36.** Aspirin is:
- Methyl salicylate
 - Acetylsalicylic acid
 - Phenyl salicylate
 - Salicylaldehyde
- Q37.** Primary aliphatic amines react with HNO_2 to give:
- Nitroalkane
 - Alcohol
 - Nitrite
 - Secondary amine
- Q38.** Monomer of Natural Rubber:
- Neoprene
 - Isoprene
 - Chloroprene
 - Styrene
- Q39.** Sucrose on hydrolysis gives:
- Glucose + Glucose
 - Glucose + Fructose
 - Glucose + Galactose
 - Fructose + Fructose
- Q40.** DNA contains:

- A. Ribose sugar
- B. Deoxyribose sugar
- C. Uracil
- D. Magnesium

Q41. Hinsberg reagent is:

- A. $C_6H_5SO_2Cl$
- B. $C_6H_5NH_2$
- C. C_6H_5COCl
- D. $SOCl_2$

Q42. Anti-Markownikoff addition of HBr is observed in presence of:

- A. $FeBr_3$
- B. Peroxide
- C. UV light
- D. $AlCl_3$

Q43. Hybridization of carbon in Ethyne:

- A. sp
- B. sp^2
- C. sp^3
- D. dsp^2

Q44. Dehydration of Alcohol at 443 K with conc. H_2SO_4 gives:

- A. Ether
- B. Alkene
- C. Alkane
- D. Ester

Q45. Lucas Reagent is a mixture of:

- A. Conc. HCl + Anhydrous $ZnCl_2$
 - B. Conc. HNO_3 + Conc. H_2SO_4
 - C. Dil. HCl + $ZnCl_2$
 - D. NaOH + CaO
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Answer key & Explanations

- (A) Using Hess's Law: $\Delta H = (-393.5) - (-395.4) = +1.9$ kJ/mol. Diamond sits at a higher energy level than graphite.
- (A) Difference ($55.9 - 50.6 = 5.3$) is the energy absorbed by the weak acid for ionization.
- (A) $W = -P\Delta V = -10^5 \times (0.01 - 0.001) = -900$ J.
- (B) Increasing pressure restricts molecular movement, decreasing entropy.
- (C) $N_1V_1 = N_2V_2 \implies 0.2 \times V = 0.5 \times 100 \implies V = 250$ mL.
- (B) NaCl dissociates ($i = 2$), lowering vapour pressure more than glucose ($i = 1$).
- (C) $t_{1/2} = 0.693/k$, which is independent of concentration.
- (C) Exothermic (Low T) and volume reduction (High P) favors NH_3 .
- (A) For zero order, Rate = k , so units are the same: $\text{mol L}^{-1} \text{s}^{-1}$.
- (C) Total $[\text{H}^+] = 10^{-8} + 10^{-7}$ (from water) = 1.1×10^{-7} . $\text{pH} \approx 6.98$.
- (A) $1000\text{g}/18\text{g/mol} = 55.5$ m.
- (C) At Anode: $2\text{Cl}^- \rightarrow \text{Cl}_2 + 2\text{e}^-$.
- (D) Lithium has the smallest atomic mass, hence 1g has the most moles.
- (A) $\Delta G = -nFE_{\text{cell}}$. Negative E makes ΔG positive (non-spontaneous).
- (B) Radial nodes = $n - l - 1 = 3 - 1 - 1 = 1$.
- (B) Cl magnitude is higher than F due to inter-electronic repulsion in F's small 2p orbital.
- (B) sp^3d^2 with 2 lone pairs in axial positions gives Square Planar.
- (C) Zn^{2+} is $3d^{10}$, all paired electrons.
- (B) $2(1) + 2x + 7(-2) = 0 \implies x = +6$.
- (B) Steric number 5 (5σ bonds) corresponds to sp^3d .
- (B) Removing an electron from anti-bonding orbital increases B.O. from 2 to 2.5.
- (D) BiH_3 has the longest/weakest M-H bond, releasing H most easily.
- (B) Ethylenediamine has two Nitrogen donor atoms.
- (A) 4f orbitals have poor shielding, pulling outer electrons in strongly.
- (B) Ligands alphabetical: ammine before chlorido. Co is (+3).
- (B) Al_2O_3 reacts with both acids and strong bases.

27. (A) sp^3d with 2 lone pairs in equatorial positions results in T-shape.
28. (A) Heavier p-block elements show stable lower oxidation states due to ns^2 reluctance.
29. (B) $d_{x^2-y^2}$ and d_{z^2} experience more repulsion in octahedral fields.
30. (B) V_2O_5 is standard for SO_2 to SO_3 conversion.
31. (D) Stabilized by 9 α -hydrogens (hyperconjugation) and three +I groups.
32. (C) Ketone + Grignard reagent \rightarrow Tertiary alcohol.
33. (C) -OH group gets numbering priority over Cl.
34. (B) Formation of Ortho-hydroxybenzaldehyde.
35. (C) Benzaldehyde lacks α -hydrogens.
36. (B) Acetylation of the salicylic acid hydroxyl group.
37. (B) Primary amines form alcohols via unstable diazonium salts.
38. (B) Natural rubber is polyisoprene (2-methyl-1,3-butadiene).
39. (B) Sucrose is a disaccharide of α -D-glucose and β -D-fructose.
40. (B) Deoxyribose sugar is the backbone of DNA.
41. (A) Benzenesulphonyl chloride distinguishes between amine types.
42. (B) Peroxide effect proceeds via a free radical mechanism.
43. (A) Triple bonded carbons are sp hybridized.
44. (B) 443 K favors elimination to form Ethene.
45. (A) 3° alcohols give immediate turbidity with this reagent.