

Chemistry

Question 1: Which of the following possess net dipole moment?

- (A) SO_2
- (B) BF_3
- (C) BECl_2
- (D) CO_2

Question 2: The number of π -bonds and σ bonds present in naphthalene are respectively

- (A) 6, 19
- (B) 5, 19
- (C) 5, 11
- (D) 5, 20

Question 3: The reaction in which $\Delta H > \Delta U$ is

- (A) $\text{N}_2(\text{g}) + \text{O}_2(\text{g}) \rightarrow 2\text{NO}(\text{g})$
- (B) $\text{CaCO}_3(\text{s}) \rightarrow \text{CaO}(\text{s}) + \text{CO}_2(\text{g})$
- (C) $\text{N}_2(\text{g}) + 3\text{H}_2(\text{g}) \rightarrow 2\text{NH}_3(\text{g})$
- (D) $\text{CH}_4(\text{g}) + 2\text{O}_2(\text{g}) \rightarrow \text{CO}_2(\text{g}) + 2\text{H}_2\text{O}(\text{l})$

Question 4: The number of moles of electron required to reduce 0.2 mole of $\text{Cr}_2\text{O}_3^{-2}$, to Cr^{+3}

- (A) 1.2
- (B) 6
- (C) 12
- (D) 0.6

Question 5: In the reaction $\text{B}(\text{OH})_3 + 2\text{H}_2\text{O} \rightarrow [\text{B}(\text{OH})_4]^- + \text{H}_3\text{O}^+$ $\text{B}(\text{OH})_3$ functions are

- (A) Protonic acid
- (B) Lewis base
- (C) Bronsted acid
- (D) Lewis acid

Question 6: Match the following acids with their pKa values:

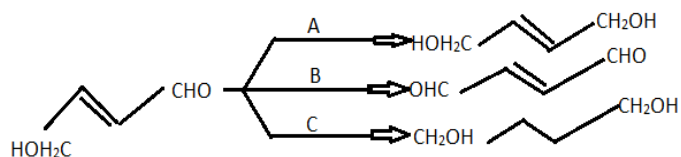
Acid		pKa	
a.	Phenol	i.	16
b.	p-Nitrophenol	ii.	0.78
c.	Ethanol	iii.	10
d.	Picric acid	iv.	7.1

	A	B	c	d
(A)	iii	iv	i	ii
(B)	ii	i	ii	iv
(C)	iii	i	iv	ii
(D)	iv	ii	iii	i

Question 7: Which of the following can be used to test the acidic nature of ethanol?

- (A) Blue litmus
- (B) Na_2CO_3
- (C) NaHCO_3
- (D) Na metal

Question 8:



The reagents A, B and c respectively are

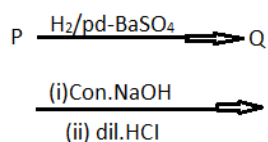
- (A) H_2/pd , PCC, NaBH_4
- (B) NaBH_4 , alk, KMnO_4 , H_2/pd
- (C) NaBH_4 , PCC, H_2/pd
- (D) H_2/pd , alk, KMnO_4 , NaBH_4

Question 9: Propanoic acid undergoes HVZ reaction to give chloropropanoic acid. The product

Obtained is

- (A) Stronger acid than propanoic acid
- (B) As stronger as propanoic acid
- (C) weaker acid than propanoic acid
- (D) Stronger than dichloropropanoic acid

Question 10:



R and S form benzyl benzoate when treated with each other. Hence P is

- (A) $\text{C}_6\text{H}_5\text{CHO}$
- (B) $\text{C}_6\text{H}_5\text{CH}_2\text{OH}$
- (C) $\text{C}_6\text{H}_5\text{COCl}$
- (D) $\text{C}_6\text{H}_5\text{COOH}$

Question 11: Among the following main reactions occurring in blast furnace during extraction of iron from haematite are

- (i) $\text{Fe}_2\text{O}_3 + 3\text{CO} \rightarrow 2\text{Fe} + 3\text{CO}_2$
 - (ii) $\text{FeO} + \text{SiO}_2 \rightarrow \text{FeSiO}_3$
 - (iii) $\text{Fe}_2\text{O}_3 + 3\text{C} \rightarrow 2\text{Fe} + 3\text{CO}$
 - (iv) $\text{CaO} + \text{SiO}_2 \rightarrow \text{CaSiO}_3$
- (A) (i) and (ii)
 - (B) (iii) and (iv)
 - (C) (ii) and (iii)
 - (D) (i) and (iv)

Question 12: Which of the following pair contains 2 lone pair of electrons on the central atom?

- (A) $\text{I}_3^+, \text{H}_2\text{O}$
- (B) $\text{H}_2\text{O}, \text{NF}_3$
- (C) $\text{XeF}_4, \text{NH}_3$
- (D) $\text{SO}_4^{2-}, \text{H}_2\text{S}$

Question 13: Which of the following statement is correct?

- (A) Cl_2 oxidises H_2O to O_2 but F_2 does not.
- (B) Cl_2 is a Stronger oxidizing agent than F_2 .
- (C) F_2 oxidises H_2O to O_2 , but Cl_2 does not
- (D) Fluoride is a good oxidising agent.

Question 14: 0.1 mole of XeF_6 is treated with 1.8 g of water. The product obtained is

- (A) XeO_3
- (B) XeO_2F_2
- (C) XeOF_4
- (D) $\text{Xe} + \text{XeO}_3$

Question 15: In the reaction of gold with aquaregia, oxidation state of Nitrogen changes from"

- (A) +4 to +2
- (B) +6 to +4
- (C) +5 to +2
- (D) +3 to +1

Question 16: The vitamin that helps to clotting of blood is

- (A) A
- (B) C
- (C) B_2
- (D) K

Question 17: The polymer containing five methylene groups in its repeating unit is

- (A) Nylon 6, 6
- (B) Nylon 6
- (C) Dacron
- (D) Bakelite

Question 18: Cis -1, 4 -polyisoprene is called

- (A) Buna -N
- (B) Neoprene
- (C) Buna-S
- (D) Natural rubber

Question 19: Which cleansing agent gets precipitated in hard water?

- (A) Sodium lauryl sulphate
- (B) Sodium Stearate

- (C) Cetyl trimethyl ammonium bromide
- (D) Sodium dodecyl benzene sulphonate

Question 20: Anti-histamine among the following is

- (A) Bromopheneramine
- (B) Morphine
- (C) Amoxicillin
- (D) Chloroxylenol

Question 21.: The elements in which electrons are progressively filled in 4f Orbital are called"

- (A) Actinoids
- (B) Transition elements
- (C) Lanthanoids
- (D) Halogens

Question 22: incorrect Statement with reference to Ce (Z=58)

- (A) Ce^{4+} is a reducing agent.
- (B) Ce in +3 oxidation state is more stable than in +4.
- (C) Atomic size of Ce is more than that of Lu.
- (D) Ce shows common oxidation states of +3 and +4

Question 23: A mixture of NaC₂O₄ and K₂Cr₂O₇ is heated with conc. H₂SO₄, deep red vapours are formed. Which of the following statements is false?

- (A) The vapours give a yellow solution with NaOH.
- (B) The vapours contain CrO₂Cl₂ only.
- (C) The vapours contain CrO₂Cl₂ and Cl₂.
- (D) The vapours when passed into lead acetate in acetic acid give a yellow precipitate.

Question 24: Which of the following statements is wrong?

- (A) In highest oxidation states, the transition metals show acidic character.
- (B) Mn^{3+} and Co^{3+} are oxidizing agents in aqueous solution.
- (C) Metals in highest oxidation states are more stable in oxides than in fluorides.
- (D) All elements of 3d series exhibit variable oxidation states.

Question 25: Which among the following is the strongest solid?

- (A) CN
- (B) NH₃
- (C) CO
- (D) en

Question 26: Which of the following is a network crystalline solid?

- (A) I₂
- (B) AlN
- (C) NaCl
- (D) Ice

Question 27: The number of atoms in 2.4 g of body centred cubic crystal with edge length 200 pm is

(density = 10 g cm⁻³, N_A = 6 × 10²³ atoms/mol)

- (A) 6 × 10²²
- (B) 6 × 10²⁰
- (C) 6 × 10²³
- (D) 6 × 10¹⁹

Question 28: 1 mole of NaCl is doped with 10⁻⁵ mole of SrCl₂. The number of cationic vacancies in the crystal lattice will be

- (A) 6.022 × 10¹⁸
- (B) 6,022 × 10¹⁵
- (C) 6.022 × 10²³
- (D) 12,044 × 10²⁰

Question 29: a non-volatile solute 'A' tetramerises in water to the extent of 80%, 2.5g of 'A' in 100g of water, lower the freezing point by 0.3 degree celceices. The molar A mass of A in mol L⁻¹ is (k, for water = 1.86 k kg mol⁻²)

- (A) 62
- (B) 221
- (C) 155
- (D) 354

Question 30: Solution 'A' contains acetone dissolved in chloroform and solution 'B' contains acetone dissolved in carbon disulphide. The type of deviations from Raoult's law shown by solutions A and B respectively are

- (A) Positive and Positive.
- (B) Positive and negative
- (C) negative and negative
- (D) negative and Positive

Question 31: The mass of AgCl precipitated when solution containing 11.70g of NaCl is added to solution containing 3.4g of AgNO₃ is [Atomic mass of Ag = 108, Atomic mass of Na=23]

- (A) 5.74 g
- (B) 1.17g
- (C) 2.87 g
- (D) 6.8 g

Question 32: Two particle A and B are in motion. If the wavelength associated with 'A' is 33.33nm, the wavelength associated with 'B' whose momentum is 1/3rd of 'A' is

- (A) 1.0×10^{-8} m
- (B) 2.5×10^{-8} m
- (C) 1.25×10^{-7} m
- (D) 1.0×10^{-7} m

Question 33: The first ionization enthalpy of the following elements are in the order:

- (A) C < N < Si < P
- (B) P < Si < N < C
- (C) P < Si < C < N
- (D) Si < P < C < N

Question 34: solubility of AgCl is least in

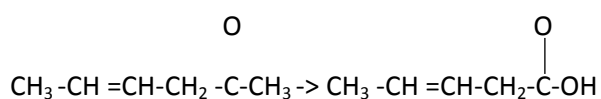
- (A) 0.1 M NaCl
- (B) Pure water
- (C) 0.1 M BaCl₂
- (D) 0.1 M AlCl₃

Question 35: which of the following equation does Not required Charles's law of given mass of gas at constant pressure?

- (A) $V/T=k$
- (B) $\log V = \log K + \log T$
- (C) $\log K = \log V + \log T$
- (D)

$$\frac{d(\ln V)}{dt} = \frac{1}{T}$$

Question 36: Which is the most suitable reagent for the following conversion?



- (A) Tollen's reagent
- (B) I_2 and NaOH solution
- (C) Benzoyl peroxide
- (D) Sn and NaOH Solution

Question 37: Which of the following is least soluble in water at 298K?

- (A) CH_3NH_2
- (B) $(\text{CH}_3)_3\text{N}$
- (C) $(\text{CH}_3)_2\text{NH}$
- (D) $\text{C}_6\text{H}_5\text{NH}_2$

Question 38: If Aniline is treated with 1:1 mixture of con. HNO_3 and con. H_2SO_4 , p-nitroaniline and m-nitroaniline are formed nearly in equal amounts. This is due to

- (A) m-directing property of $-\text{NH}_2$ group
- (B) Protonation of $-\text{NH}_2$ which causes deactivation of benzene ring
- (C) m and p directing property of $-\text{NH}_2$ group
- (D) Isomerisation of some p-nitroaniline into m-nitroaniline

Question 39: In nucleic acids, the nucleotides are joined together by

- (A) Phosphoester linkage
- (B) Phosphodiester linkage

(C) Phosphodisulphide linkage

(D) Sulphodister linkage

Question 40: Which of the following is generally water insoluble?

(A) Fibrous protein

(B) Vitamin-C

(C) Amylose

(D) Glycine

Question 41: Relative lowering of vapour pressure of dilute solution glucose dissolved in 1kg of water is 0.002. The molarity of the solution is

(A) 0.004

(B) 0.222

(C) 0.111

(D) 0.021

Question 42: one litre solution of $MgCl_2$ is electrolyzed completely by passing a current of 1A for 16 min 5 sec. The original concentration of $MgCl_2$ solution was (Atomic mass of Mg = 24)

(A) $5 \times 10^{-3} M$

(B) $5 \times 10^{-2} M$

(C) $0.5 \times 10^{-3} M$

(D) $1.0 \times 10^{-2} M$

Question 43: All aqueous solution of $CuSO_4$ is subjected to electrolysis using inert electrodes.

The pH of the solution will

(A) increase

(B) remains unchanged

(C) decrease

(D) increase or decrease depending on the strength of the current

Question 44: Give $E_{Mn^{2+}/Mn^{+3}}^{\circ} = 1.5V$ and $E_{Mn^{2+}/Mn^{+4}}^{\circ} = 1.2V$ then $E_{Mn^{2+}/Mn^{+7}}^{\circ}$ is

(A) 0.3V

(B) 0.1 V

(C) 1.7 v

(D) 2.1V

Question 45: The plot of $t_{1/2}$ v/s $[R]_0$ for a reaction is a straight-line parallel to x-axis. The unit for the rate constant of this reaction is

(A) $\text{mol L}^{-1}\text{S}$

(B) $\text{mol L}^{-1}\text{S}^{-1}$

(C) $\text{L mol}^{-1}\text{S}^{-1}$

(D) S^{-1}

Question 46: The metal nitrate that liberates NO_2 on heating

(A) NaNO_3

(B) LiNO_3

(C) KNO_3

(D) RbNO_3

Question 47: Which of the following is NOT true regarding the usage of hydrogen as a fuel?

(A) High calorific value

(B) The combustible energy of hydrogen can be directly converted to electrical energy in fuel cell

(C) Combustion product is eco-friendly

(D) Hydrogen gas can be easily liquefied and stored.

Question 48: Resonance effect is not observed in

(A) $\text{CH}_2 = \text{CH}-\text{CH} = \text{CH}_2$

(B) $\text{CH}_2 = \text{CH}-\text{C} = \text{N}$

(C) $\text{CH}_2 = \text{CH}-\text{Cl}$

(D) $\text{CH}_2 = \text{CH}-\text{CH}_2-\text{NH}_2$

Question 49: 2-butyne is reduced to trans-but -2-ene using

(A) H_2 | Ni

(B) Na in liq. NH_3

(C) H_2 | Pd-C

(D) Zn in dil. HCl

Question 50: Eutrophication causes

- (A) Increase of nutrient in water
- (B) Reduction in water pollution
- (C) Reauction in dissolved oxygen
- (D) Decreases BOD

Question 51: Addition of excess of AgNO_3 to an aqueous solution of 1mole of $\text{PdCl}_2 \cdot 4\text{NH}_2$ gives 2 moles of AgCl . The conductivity of this solution corresponds co

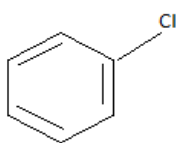
- (A) 1:1 electrolyte
- (B) 1:3 electrolyte
- (C) 1:2 electrolyte
- (D) 1:4 electrolyte

Question 52: The formula of penta aquanitrate chromium (III) nitrate is.

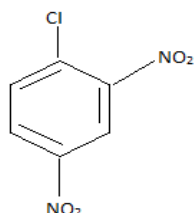
- (A) $[\text{Cr}(\text{H}_2\text{O})_6(\text{NO}_2)_3]$
- (B) $[\text{Cr}(\text{H}_2\text{O})_6(\text{NO}_2)_2]$
- (C) $[\text{Cr}(\text{H}_2\text{O})_5\text{NO}_3](\text{NO}_3)_2$
- (D) $[\text{Cr}(\text{H}_2\text{O})_5\text{NO}_2]\text{NO}_3$

Question 53: Which of the following HALIDE undergoes hydrolysis on warming with water/aqueous NaOH ?

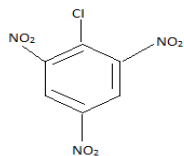
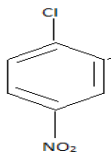
(A)



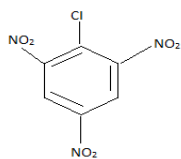
(B)



(C)

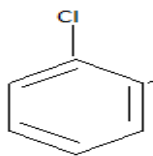


(D)

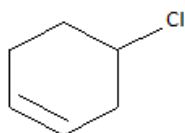


Question 54: The compound having longest C-Cl bond is

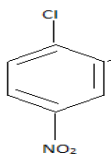
(A)



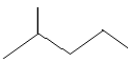
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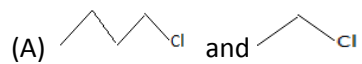


(C)

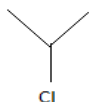


(D) $\text{CH}_2=\text{CH}-\text{Cl}$

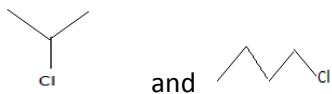
Question 55: The alkyl halides required to prepare by  Wurtz reaction are



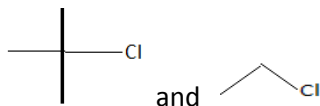
(B)



(C)



(D)



Question 56: Which is a wrong statement?

- (A) Rate constant $k = \text{Arrhenius constant } A : \text{ if } E_a = 0$
- (B) $e^{-E_a/rt}$ gives the fraction of reactant molecules that are activated at the given temp
- (C) $\ln k$ vs $1/T$ plot is a straight line
- (D) Presence of catalyst will not alter the value of E_a

Question 57: 1L of 2 M CH_3COOH is mixed with 1L of 3M $\text{C}_2\text{H}_5\text{OH}$ to form an ester. The rate of reaction with respect to the initial rate when each solution is diluted with an equal volume of water will be

- (A) 0.25 times
- (B) 2 times
- (C) 0.5 times
- (D) 4 times

Question 58: Which of the following is an example of homogeneous catalysis?

- (A) Oxidation of NH_3 Ostwald's process
- (B) oxidation of SO_2 In contact process
- (C) oxidation SO_2 in lead chamber process
- (D) Manufacture of NH_3 by Haber's process

Question 59: Critical Micelle concentration for a soap solution is $1.5 \times 10^{-4} \text{ mol L}^{-1}$. Micelle formation is possible only when the concentration of soap solution in mol L^{-1} is

- (A) 2.0×10^{-3}
- (B) 4.6×10^{-5}
- (C) 7.5×10^{-5}
- (D) 1.1×10^{-4}

Question 60: Oxidation State of copper is +1 in

- (A) Malschite
- (B) Cuprite
- (C) Azurite
- (D) Chalcopyrite