Sample Paper-01

Class 12th NEET (2024)

CHEMISTRY

SECTION-A

1. If mercury is used as cathode in the electrolysis of aqueous NaCl solution, the ions discharged at cathode are;

(1) H^+ (2) Na^+

(3) OH^- (4) Cl^-

2. 1 mole of urea is dissolved in 9 moles of water. If vapour pressure of pure water is 40 mmHg. The vapour pressure of solution is:

(1) 32.6 mmHg (2) 36 mmHg

(3) 42 mmHg (4) 34.8 mmHg

3. Which of the following on addition in 1.0 molal KI solution will give rise to increase a vapour pressure?

(1) addition of NaCl

(2) addition of Na_2SO_4

(3) addition of 1.00 molal KI

(4) addition of water

4. A solution containing 8.6 g urea in one litre was found to be isotonic with a 5% (mass/volume) solution of an organic non-volatile solute. The molar mass of solute is;

(1) 348.83 (2) 34.89

(3) 3489 (4) 861.2

5. Van't Hoff factor is;

(1) more than one in case of association

(2) less than one in case of dissociation

(3) $\dfrac{\text{normal molecular mass}}{\text{observed molecular mass}}$

(4) $\dfrac{\text{observed molecular mass}}{\text{normal molecular mass}}$

6. A 5% solution (by mass) of cane sugar in water has freezing point of 271 K and freezing point of pure water is 273.15 K. The freezing point of a 5% solution (by mass) of glucose in water is;

(1) 271K

(2) 273.15K

(3) 269.07K

(4) 277.23K

7. Consider a first order gas phase decomposition reaction given below:

$A(g) \longrightarrow B(g) + C(g)$

The initial pressure of the system before decomposition of A was P_i. After lapse of time 't', total pressure of the system increased by x units and became 'P_t'.

The rate constant k for reaction is given as:

(1) $k = \dfrac{2.303}{t} \log \dfrac{P_i}{P_i - P_t}$

(2) $k = \dfrac{2.303}{t} \log \dfrac{P_i}{2P_i - P_t}$

(3) $k = \dfrac{2.303}{t} \log \dfrac{P_i}{2P_i + P_t}$

(4) $k = \dfrac{2.303}{t} \log \dfrac{P_i}{P_i + x}$

8. Which of the following statements is **correct**?

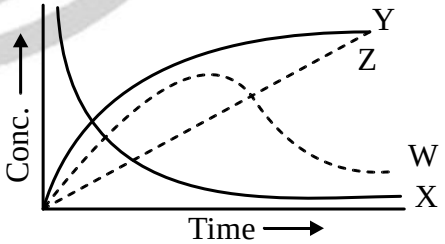
(1) E_{cell} and ΔG of cell reaction both are extensive properties.

(2) E_{cell} and ΔG of cell reaction both are intensive properties.

(3) E_{cell} is an intensive properties while ΔG of cell is an extensive property.

(4) E_{cell} is an extensive properties while ΔG of cell is an intensive property.

9. For the reaction A + B $\rightarrow$ C + D. The variation of the concentration of the products is given by the curve:



(1) X (2) Y

(3) Z (4) W

10. Which statement is true about a galvanic cell employing Pb, Cu, Pb^{2+} and Cu^{2+}?

$E^0_{Pb^{2+}/Pb} = -0.127\ V$; $E^0_{Cu^{2+}/Cu} = +0.518\ V$

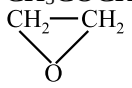
(1) Spontaneous cell-reaction will be in the cell $Pb\,|Pb^{2+}\,||\,Cu^{+}\,|\,Cu$

(2) $E^0_{cell} = 0.645\ V$

(3) Both (1) and (2) are correct

(4) None of the above

11. **Assertion (A):** In rate law, unlike in the expression for equilibrium constants, the exponents for concentrations do not necessarily match the stoichiometric coefficients.
Reason (R): It is the mechanism and not the balanced chemical equation for the overall change that governs the reaction rate.
(1) Both **Assertion (A)** and **Reason (R)** are the true, and **Reason (R)** is a correct explanation of **Assertion (A)**.
(2) Both **Assertion (A)** and **Reason (R)** are the true, but **Reason (R)** is not a correct explanation of **Assertion (A)**.
(3) **Assertion (A)** is true, and **Reason (R)** is false.
(4) **Assertion (A)** is false, and **Reason (R)** is true.

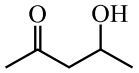
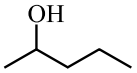
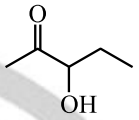
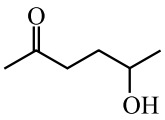
12. 2-Phenylethanol may be prepared by the reaction of phenyl magnesium bromide with:
(1) HCHO
(2) CH_3CHO
(3) CH_3COCH_3
(4) 

13. **Assertion (A):** If the activation energy of a reaction is zero, temperature will have no effect on the rate constant.
Reason (R): Lower the activation energy, faster is the reaction.
(1) Both **Assertion (A)** and **Reason (R)** are the true, and **Reason (R)** is a correct explanation of **Assertion (A)**.
(2) Both **Assertion (A)** and **Reason (R)** are the true, but **Reason (R)** is not a correct explanation of **Assertion (A)**.
(3) **Assertion (A)** is true, and **Reason (R)** is false.
(4) **Assertion (A)** is false, and **Reason (R)** is true.

14. The diamagnetic species is;
(I) $[Cu(CN)_4]^{3-}$ (II) $[Co(NH_3)_6]^{3+}$
(III) $[Ni(NH_3)_6]^{2+}$ (IV) $[Fe(CN)_6]^{3-}$
(1) I, III (2) I, II
(3) III, IV (4) only IV

15. What happens when 2,4,6-Trinitrochlorobenzene is just warmed with water?
(1) No reaction takes place
(2) A hydrate is formed
(3) 2,4-Dinitrophenol is formed
(4) Picric acid is formed

16. 0.1435 m solution of a non-volatile, non-electrolyte solute has the freezing point 0.73 degrees lower than that of benzene. What is the value of molal freezing point depression constant of benzene?
(1) 5.087 Km^{-1} (2) 40.0 Km^{-1}
(3) 0.52 Km^{-1} (4) 1.86 Km^{-1}

17. Which one of the following will most readily be dehydrated in acidic conditions?
(1)  (2) 
(3)  (4) 

18. **Statement I:** On increasing dilution, the specific conductance keep on increasing.
Statement II: On increasing dilution, degree of ionisation of weak electrolyte increases and mobility of ions also increases.
(1) Statement I and Statement II both are correct.
(2) Statement I is correct, but Statement II is incorrect.
(3) Statement I is incorrect, but Statement II is correct.
(4) Statement I and Statement II both are incorrect.

19. **Statement I:** During electrolysis of $CuSO_4$ (aq) using copper electrodes, copper is dissolved at anode and deposited at cathode.
Statement II: Oxidation takes place at anode and reduction at cathode.
(1) Statement I and Statement II both are correct.
(2) Statement I is correct, but Statement II is incorrect.
(3) Statement I is incorrect, but Statement II is correct.
(4) Statement I and Statement II both are incorrect.

20. **Statement I:** The order of a reaction can have fractional value.
Statement II: The order of a reaction cannot be written from balanced equation of a reaction.
(1) Statement I and Statement II both are correct.
(2) Statement I is correct, but Statement II is incorrect.
(3) Statement I is incorrect, but Statement II is correct.
(4) Statement I and Statement II both are incorrect.

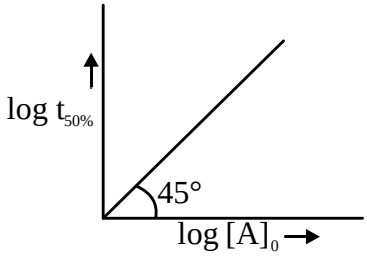
21. The standard reduction potentials, E^0, for the half reactions are
$Zn^{2+} + 2e^- \rightarrow Zn$; $E^0 = -0.76V$
$Fe^{2+} + 2e^- \rightarrow Fe$; $E^0 = -0.41$ V
The EMF for the cell reaction
$Fe^{2+} + Zn \rightarrow Zn^{2+} + Fe$ is;
(1) –0.35 V (2) +0.35 V
(3) + 1.17 V (4) –1.17 V

22. Match **List-I** with **List-II** to find out the **correct** option.

List-I		List-II	
(A)	XeF_4	(I)	Distorted octahedral
(B)	XeF_6	(II)	Square planar
(C)	XeO_3	(III)	Pyramidal
(D)	XeO_4	(IV)	Tetrahedral

(1) A → II; B → I; C → IV; D → III
(2) A → III; B → II; C → I; D → IV
(3) A → II; B → I; C → III; D → IV
(4) A → IV; B → III; C → II; D → I

23. The order of a reaction and rate constant for a chemical change having log $t_{50\%}$ vs log $[A]_0$ curve as



would be;
(1) 0, $\frac{1}{2}$ (2) 1, 1
(3) 2, 2 (4) 0, 1

24. Nitrogen forms stable N_2 molecule but phosphorus is converted P_4 from P_2. The reason for this is:
(1) triple bond is present between phosphorus atoms.
(2) $p\pi - p\pi$ bonding is weak.
(3) $p\pi - p\pi$ bonding is strong.
(4) multiple bond is formed easily.

25. At low temperature, phenol reacts with Br_2 in CS_2 to form _____.
(1) m-bromophenol
(2) o and p-bromophenol
(3) p-bromophenol
(4) 2, 4, 6-tribromophenol

26. A sample of $CHCl_3$ before being used as an anaesthetic agent is tested by _____.
(1) fehling's solution.
(2) ammonical solution of cuprous chloride.
(3) silver nitrate solution in cold.
(4) silver nitrate solution after boiling with alcoholic KOH.

27. Which of the following valence shell configuration belongs to transition elements?
(1) $3s^2 3p^6 3d^5 4s^1$
(2) $3s^2 3p^6 3d^{10} 4s^2 4p^3$
(3) $3s^2 3p^6 3d^{10} 4s^2 4p^1$
(4) $4s^2 4p^6 4d^{10} 5s^2 5p^1$

28. Match **List-I** with **List-II** to find out the **correct** option.

List-I		List-II	
(A)	Oleum	(I)	$H_2S_2O_8$
(B)	Caro's acid	(II)	H_2SO_5
(C)	Marshall's acid	(III)	$H_2S_2O_7$

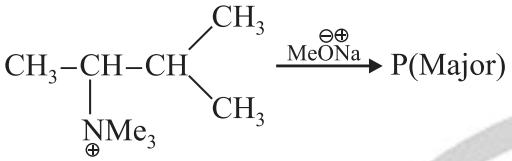
(1) A → I; B → II; C → III
(2) A → III; B → II; C → I
(3) A → II; B → III; C → I
(4) A → III; B → I; C → II

29. The correct order of acidic strength of the following compounds is _____.
(1) $Cl_2O_7 > SO_2 > P_4O_{10}$
(2) $K_2O > CaO > MgO$
(3) $CO_2 > N_2O_5 > SO_3$
(4) $Na_2O > MgO > Al_2O_3$

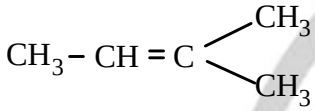
30. The product(s) obtained when $KMnO_4$ and HCl react together to form H_2O and Cl_2 along with:
(1) KCl (2) $MnCl_2$
(3) Both (1) & (2) (4) None of these

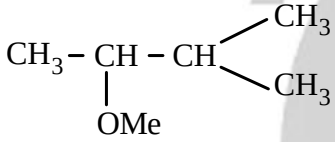
31. Which statement is **correct** ?
(1) SO_2 dissolve in water & forms sulphurous acid.
(2) SO_2 act as a bleaching agent.
(3) SO_2 has pungent odour.
(4) All of these

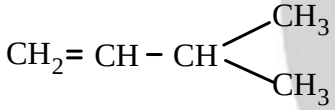
32. Consider the following reaction

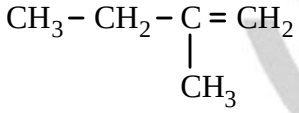


Major product (P) is;

(1) 

(2) 

(3) 

(4) 

33. **Incorrect** statement among the following is:
(1) Carbonium ion intermediate is formed in S_N1 reaction.
(2) Five membered transition state is formed in S_N2 reaction.
(3) S_N1 reaction is accelerated in polar protic solvent.
(4) DMSO is polar protic solvent.

34. When isopropyl bromide is reacted with AgCN then the product formed is;
(1) Isoproyl cyanide (2) Isopropyl isocyanide
(3) Pentanenitrile (4) Propane nitrile

35. IUPAC name of neopentyl bromide is;
(1) 1́–Bromo–4,4–dimethylpentane
(2) 1–Bromo–3–methylbutane
(3) 1–Bromo–2,2–dimethylpropane
(4) 2–Bromo–2–methylbutane

SECTION-B

36. For metal-carbon bond in the metal carbonyls which is/are **correct**?
(1) M-C σ bond is formed by the donation of lone pair of electrons of the carbonyl carbon into a vacant orbital of metal.
(2) The M–C π bond is formed by the donation of a pair of electrons from a filled orbital of metal into the vacant antibonding π* orbital of carbon monoxide.
(3) M–C σ bond is formed by the donation of a lone pair of electrons from a filled orbital of metal into the vacant antibonding π* orbital of carbon monoxide.
(4) Both (1) and (2)

37. The coordination compound that can be used for the hydrogenation of alkene is;
(1) $[Ag(S_2O_3)_2]^{3-}$ (2) $[Rh(PPh_3)_3Cl]$
(3) $[PtC_2H_4Cl_3]^-$ (4) $[Au(CN)_2]^-$

38. IUPAC name of the linkage isomer of $[Co(NH_3)_5(ONO)]Cl_2$ will be:
(1) pentaammineni trito–O–cobalt (III) chloride
(2) pentaammineni trito–N–cobalt (III) chloride
(3) cobalt (III) pentaammineni trito–O–chloride
(4) pentaammineni trito–N–cobalt (III) dichloride

39. Which of the following is **not** π-acid ligand?
(1) CN^- (2) SH^-
(3) CO (4) NO^+

40. Which of the following is tetrahedral complex?
(1) $[Ni(CO)_4]$ (2) $[Ni(CN)_4]^{2-}$
(2) $[Pt(NH_3)_2Cl_2]^{2+}$ (4) $[Cu(NH_3)_4]^{2+}$

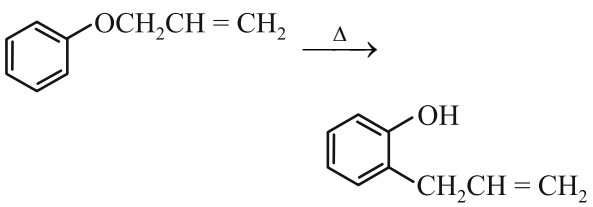
41. Which of the following is the **correct** representation of spectrochemical series?
(1) $Cl^- < NO_2^- < CN^- < CO$
(2) $Cl^- < Br^- < O^{-2} < OH^-$
(3) $NO_2^- < CO < CN^- < Cl^-$
(4) $SCN^- < Cl^- < OH^- < S^{-2}$

42. Which is a diamagnetic complex?
(1) $[Fe(H_2O)_6]^{+3}$
(2) $[Fe(H_2O)_6]^{+2}$
(3) $[Fe(CN)_6]^{3-}$
(4) $[Fe(CN)_6]^{4-}$

43. Select the ligand having highest trans–effect;

(1) H_2O (2) CN^-

(3) CH_3^- (4) OH^-

44. 

This reaction is called;

(1) Benzilic acid rearrangement.

(2) Claisen rearrangement.

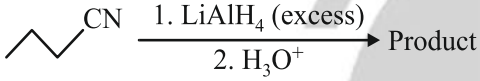
(3) Fries rearrangement.

(4) Schottenbaumann reaction.

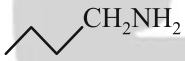
45. Which of the following reagent can be used to oxidize 1° alcohol to aldehyde?

(1) $KMnO_4$ (2) BCC

(3) H_2O_2 (4) PCC

46. 

Major product formed in the above mentioned reaction is:

(1)  (2) 

(3)  (4) 

47. Which of the following is a basic amino acid?

(1) Glycine (2) Alanine

(3) Leucine (4) Lysine

48. Which amino acid does **not** contain a chiral center?

(1) Valine

(2) Leucine

(3) Glycine

(4) Iso-leucine

49. The disaccharide present in the milk is;

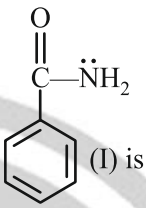
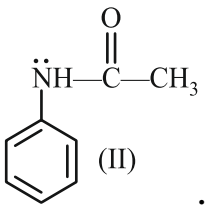
(1) maltose

(2) lactose

(3) sucrose

(4) cellulose

50. **Assertion (A):**

 (I) is more basic than  (II).

Reason (R): Delocalisation of lone pair of electrons decreases the basic strength.

(1) Both **Assertion (A)** and **Reason (R)** are the true, and **Reason (R)** is a correct explanation of **Assertion (A)**.

(2) Both **Assertion (A)** and **Reason (R)** are the true, but **Reason (R)** is not a correct explanation of **Assertion (A)**.

(3) **Assertion (A)** is true, and **Reason (R)** is false.

(4) **Assertion (A)** is false, and **Reason (R)** is true.