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PREVIOUS YEAR's QUESTIONS

NEET 2022   **CHEMISTRY (SOLVED)**

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1. Which statement regarding polymers is not correct?
(1) Thermosetting polymers are reusable
(2) Elastomers have polymer chains held together by weak intermolecular forces
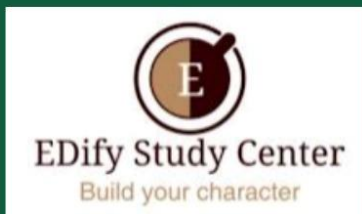(3) Fibers possess high tensile strength

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(4) Thermoplastic polymers are capable of repeatedly softening and hardening on heating and cooling respectively.

2. At 298 K, the standard electrode potentials of Cu^{2+}/ Cu, Zn^{2+}/ Zn, Fe^{2+}/Fe and Ag^+/ Ag are 0.34 V, –0.76 V, –0.44 V and 0.80 V, respectively.
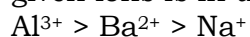On the basis of standard electrode potential, predict which of the following reaction cannot occur?
(1) $2CuSO_4(aq) + 2Ag(s) \rightarrow 2Cu(s) + Ag_2SO_4(aq)$
(2) $CuSO_4(aq) + Zn(s) \rightarrow ZnSO4(aq) + Cu(s)$
(3) $CuSO_4(aq) + Fe(s) \rightarrow FeSO4(aq) + Cu(s)$
(4) $FeSO_4(aq) + Zn(s) \rightarrow ZnSO4(aq) + Fe(s)$

3. The IUPAC name of an element with atomic number 119 is
(1) ununoctium
(2) ununennium
(3) unnilennium
(4) unununnium

4. Given below are two statements
Statement I: In the coagulation of a negative sol, the flocculating power of the three given ions is in the order.
$Al^{3+} > Ba^{2+} > Na^+$
Statement II: In the coagulation of a positive sol, the flocculating power of the three given salts is in the order
$NaCl > Na_2SO_4 > Na_3PO_4$
In the light of the above statements, choose the most appropriate answer from the options given below
(1) Statement I is incorrect but Statement II is correct.
(2) Both Statement I and Statement II are correct.
(3) Both Statement I and Statement II are incorrect.
(4) Statement I is correct but Statement II is incorrect.

5. Which of the following statement is not correct about diborane?
(1) Both the Boron atoms are sp^2 hybridised.
(2) There are two 3-centre-2-electron bonds.
(3) The four terminal B-H bonds are two centre two electron bonds.
(4) The four terminal Hydrogen atoms and the two Boron atoms lie in one plane.
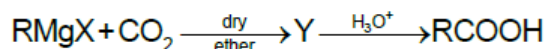
6.

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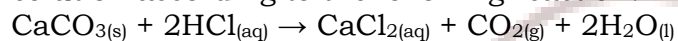
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$$RMgX + CO_2 \xrightarrow[\text{ether}]{\text{dry}} Y \xrightarrow{H_3O^+} RCOOH$$

What is Y in the above reaction?
(1) $(RCOO)_2Mg$
(2) $RCOO^- Mg^+ X$
(3) $R_3CO^- Mg^+ X$
(4) $RCOO^- X^+$

7. What mass of 95% pure $CaCO_3$ will be required to neutralise 50 mL of 0.5 M HCl solution according to the following reaction?
$CaCO_{3(s)} + 2HCl_{(aq)} \rightarrow CaCl_{2(aq)} + CO_{2(g)} + 2H_2O_{(l)}$
[Calculate upto second place of decimal point]
(1) 9.50 g
(2) 1.25 g
(3) 1.32 g
(4) 3.65 g

8. Which amongst the following is incorrect statement?
(1) O_2^+ ion is diamagnetic
(2) The bond orders of O_2^+, O_2 and O_2^- are 2.5, 2, 1.5 and 1, respectively
(3) C_2 molecule has four electrons in its two degenerate π molecular orbitals
(4) H_2^+ ion has one electron

9. Amongst the following which one will have maximum 'lone pair - lone pair' electron repulsions?
(1) XeF_2
(2) CIF_3
(3) IF_5
(4) SF_4

10. Choose the correct statement:
(1) Both diamond and graphite are used as dry lubricants.
(2) Diamond and graphite have two dimensional network.
(3) Diamond is covalent and graphite is ionic.
(4) Diamond is sp^3 hybridised and graphite is sp^2 hybridized.

11. Given below are two statements: one is labelled as Assertion (A) and the other is labelled as Reason (R).

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Assertion (A): In a particular point defect, an ionic solid is electrically neutral, even if few of its cations are missing from its unit cells.
Reason (R):
In an ionic solid, Frenkel defect arises due to dislocation of cation from its lattice site to interstitial site, maintaining overall electrical neutrality.
In the light of the above statements, choose the most appropriate answer from the options given below:
(1) (A) is not correct but (R) is correct
(2) Both (A) and (R) are correct and (R) is the correct explanation of (A)
(3) Both (A) and (R) are correct but (R) is not the correct explanation of (A)
(4) (A) is correct but (R) is not correct

12.Match List-I with List-II

List-I	List-II
(a) Li	(i) absorbent for carbon dioxide
(b) Na	(ii) electrochemical cells
(c) KOH	(iii) coolant in fast breeder reactors
(d) Cs	(iv) photoelectric cell

Choose the correct answer from the options given below :
(1) (a) - (ii), (b) – (iii), (c) – (i), (d) – (iv)
(2) (a) - (iv), (b) – (i), (c) – (iii), (d) – (ii)
(3) (a) - (iii), (b) – (iv), (c) – (ii), (d) – (i)
(4) (a) - (i), (b) – (iii), (c) – (iv), (d) – (ii)

13. Given below are half cell reactions:
MnO_4^- +8H$^+$ +5e$^-$ → Mn^{2+} +4H$_2$O

$E^{\circ}_{Mn^{2+}/MnO_4^-} = -1.510$ V

$\frac{1}{2}$ O$_2$ +2H$^+$ +2e$^-$ → H$_2$O

$E^{\circ}_{O_2/H_2O} = +1.223$ V

Will the permanganate ion, MnO_4^- liberate O$_2$ from water in the presence of an acid?
(1) No, because E^0_{cell}= − 2.733 V
(2) Yes, because E^0_{cell}= + 0.287 V
(3) No, because E^0_{cell}= − 0.287 V
(4) Yes, because E^0_{cell}= + 2.733 V

14. Match List-I with List-II.
        List – I   List – II

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(Hydrides)	(Nature)
(a) MgH_2	(i) Electron precise
(b) GeH_4	(ii) Electron deficient
(c) B_2H_6	(iii) Electron rich
(d) HF	(iv) Ionic

Choose the correct answer from the options given below

(1) (a) − (ii), (b) − (iii), (c) − (iv), (d) − (i)
(2) (a) − (iv), (b) − (i), (c) − (ii), (d) − (iii)
(3) (a) − (iii), (b) − (i), (c) − (ii), (d) − (iv)
(4) (a) − (i), (b) − (ii), (c) − (iv), (d) − (iii)

15. Given below are two statements
Statement I: The acidic strength of monosubstituted nitrophenol is higher than phenol because of electron withdrawing nitro group.
Statement II:
o-nitrophenol, m-nitrophenol and p-nitrophenol will have same acidic strength as they have one nitro group attached to the phenolic ring.
In the light of the above statements, choose the most appropriate answer from the options given below:
(1) Statement I is incorrect but Statement II is correct.
(2) Both Statement I and Statement II are correct.
(3) Both Statement I and Statement II are incorrect.
(4) Statement I is correct but Statement II is incorrect.

16. Match List-I with List-II.

List-I	List-II
(Drug class)	(Drug molecule)
(a) Antacids	(i) Salvarsan
(b) Antihistamines	(ii) Morhine
(c) Analgesics	(iii) Cimetidine
(d) Antimicrobials	(iv) Seldane

Choose the correct answer from the options given below :

(1) (a) - (iv), (b) − (iii), (c) − (i), (d) − (ii)
(2) (a) - (iii), (b) − (ii), (c) − (iv), (d) − (i)
(3) (a) - (iii), (b) − (iv), (c) − (ii), (d) − (i)
(4) (a) - (i), (b) − (iv), (c) − (ii), (d) − (iii)

17. The incorrect statement regarding enzymes is
(1) Enzymes are very specific for a particular reaction and substrate.

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(2) Enzymes are biocatalysts.
(3) Like chemical catalysts enzymes reduce the activation energy of bio processes.
(4) Enzymes are polysaccharides.

18. Identify the incorrect statement from the following.
(1) The shapes of d_{xy}, d_{yz} and d_{zx} orbitals are similar to each other; and $d_{x^2-y^2}$ and d_{z^2} are similar to each other.
(2) All the five 5d orbitals are different in size when compared to the respective 4d orbitals.
(3) All the five 4d orbitals have shapes similar to the respective 3d orbitals.
(4) In an atom, all the five 3d orbitals are equal in energy in free state.

19. The incorrect statement regarding chirality is
(1) A racemic mixture shows zero optical rotation
(2) S_N1 reaction yields 1 : 1 mixture of both enantiomers
(3) The product obtained by SN_2 reaction of haloalkane having chirality at the reactive site shows inversion of configuration
(4) Enantiomers are superimposable mirror images on each other
19(4)
Enantiomers are non-superimposable mirror images of each other.

20. Which compound amongst the following is not an aromatic compound?
(1)
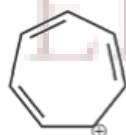
(2)

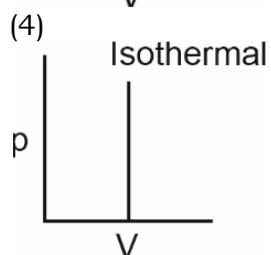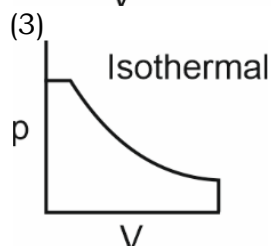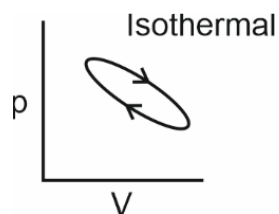(3)

(4)

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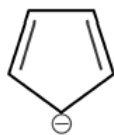
21. The given graph is a representation of kinetics of a reaction.
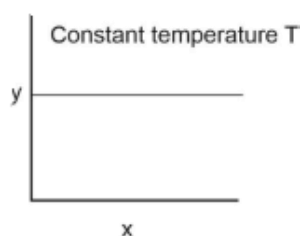
The y and x axes for zero and first order reactions, respectively are
(1) zero order (y = rate and x = concentration), first order (y = rate and x = $t_{1/2}$)
(2) zero order (y = concentration and x = time), first order (y = $t_{1/2}$ and x = concentration)
(3) zero order (y = concentration and x = time), first order (y = rate constant and x = concentration)
(4) zero order (y = rate and x = concentration), first order (y = $t_{1/2}$ and x = concentration)

22. Which one is not correct mathematical equation for Dalton's Law of partial pressure? Here p = total pressure
of gaseous mixture
(1) $pi = \chi_i \, p_i^0$,   where χ_i = mole fraction of ith gas in gaseous mixture
                              p_i^0 = pressure of ith gas in pure state
(2) $p = p_1 + p_2 + p_3$
(3) $p = n_1\frac{RT}{V} + n_2\frac{RT}{V} + n_3\frac{RT}{V}$
(4) $p_i = \chi_i \, p_i^0$,   where p_i = partial pressure of ith gas
                              χ_i = mole fraction of ith gas in gaseous mixture

23. Given below are two statements
Statement I: Primary aliphatic amines react with HNO_2 to give unstable diazonium salts.
Statement II: Primary aromatic amines react with HNO_2 to form diazonium salts which are stable even above 300 K. In

the light of the above statements, choose the most appropriate answer from the options given below
(1) Statement I is incorrect but Statement II is correct.
(2) Both Statement I and Statement II are correct.
(3) Both Statement I and Statement II are incorrect.
(4) Statement I is correct but Statement II is incorrect.

24. Identify the incorrect statement from the following
(1) Lithium is the strongest reducing agent among the alkali metals.
(2) Alkali metals react with water to form their hydroxides.
(3) The oxidation number of K in KO_2 is +4.
(4) Ionisation enthalpy of alkali metals decreases from top to bottom in the group.

25. The IUPAC name of the complex-
$[Ag(H_2O)_2][Ag(CN)_2]$ is:
(1) diaquasilver(I) dicyanidoargentate(I)
(2) dicyanidosilver(II) diaquaargentate(II)
(3) diaquasilver(II) dicyanidoargentate(II)
(4) dicyanidosilver(I) diaquaargentate(I)

26. The pH of the solution containing 50 mL each of 0.10 M sodium acetate and 0.01 M acetic acid is [Given pKa of CH_3COOH = 4.57]
(1) 2.57
(2) 5.57
(3) 3.57
(4) 4.57

27. Which of the following p-V curve represents maximum work done?
(1)

(2)

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(3)

(4)

28. Match List-I with List-II.

List – I	List – II
(Products formed)	(Reaction of carbonyl compound with)
(a) Cyanohydrin	(i) NH_2OH
(b) Acetal	(ii) RNH_2
(c) Schiff's base	(iii) alcohol
(d) Oxime	(iv) HCN

Choose the correct answer from the options given below

(1) (a) – (iv), (b) – (iii), (c) – (ii), (d) – (i)

(2) (a) – (iii), (b) – (iv), (c) – (ii), (d) – (i)

(3) (a) – (ii), (b) – (iii), (c) – (iv), (d) – (i)

(4) (a) – (i), (b) – (iii), (c) – (ii), (d) – (iv)

29. Which of the following sequence of reactions is suitable to synthesize chlorobenzene?
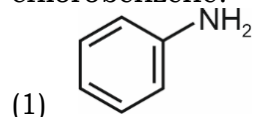
(1)

, HCl, Heating

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(2) Benzene, Cl_2, anhydrous $FeCl_3$
(3) Phenol, $NaNO_2$, HCl, CuCl

(4) , HCl
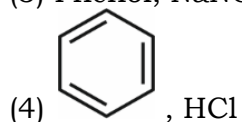
30. The Kjeldahl's method for the estimation of nitrogen can be used to estimate the amount of nitrogen in which one of the following compounds?
(1)
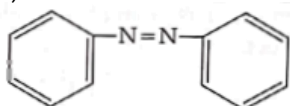
(2)
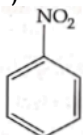
(3)
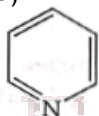
(4)
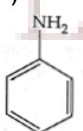
31. Given below are two statements :
Statement I : The boiling points of aldehydes and ketones are higher than hydrocarbons of comparable molecular masses because of weak molecular association in aldehydes and ketones due to dipole – dipole interactions.
Statement II : The boiling points of aldehydes and ketones are lower than the alcohols of similar molecular masses due to the absence of H-bonding.
In the light of the above statements, choose the most appropriate answer from the given below
(1) Statement I is incorrect but Statement II is correct

(2) Both Statement I and Statement II are correct
(3) Both Statement I and Statement II are incorrect
(4) Statement I is correct but Statement II is incorrect

32. Given below are two statements
Statement I
The boiling points of the following hydrides of group 16 elements increases in the order – $H_2O < H_2S < H_2Se < H_2Te$
Statement II
The boiling points of these hydrides increase with increase in molar mass.
In the light of the above statements, choose the most appropriate answer from the options given below :
(1) Statement I is incorrect but Statement II is correct
(2) Both Statement I and Statement II are correct
(3) Both Statement I and Statement II are incorrect
(4) Statement I is correct but Statement II is incorrect

33. In one molal solution that contains 0.5 mole of a solute, there is
(1) 1000 g of solvent
(2) 500 mL of solvent
(3) 500 g of solvent
(4) 100 mL of solvent

34. Given below are two statements: one is labelled as Assertion (A) and the other is labelled as Reason (R).
Assertion (A): ICI is more reactive than I2.
Reason (R): I-CI bond is weaker than I-I bond.
In the light of the above statements, choose the most appropriate answer from the options given below:
(1) (A) is not correct but (R) is correct
(2) Both (A) and (R) are correct and (R) is the correct explanation of (A).
(3) Both (A) and (R) are correct but (R) is not the correct explanation of (A).
(4) (A) is correct but (R) is not correct

35. Gadolinium has a low value of third ionisation enthalpy because of
(1) high basic character
(2) small size
(3) high exchange enthalpy
(4) high electronegativity

Section B

36. Compound X on reaction with O_3 followed by Zn/H_2O gives formaldehyde and 2-methyl propanal as products. The compound X is
(1) Pent-2-ene
(2) 3-Methylbut-1-ene
(3) 2-Methylbut-1-ene
(4) 2-Methylbut-2-ene

37. For a first order reaction A → Products, initial concentration of A is 0.1 M, which becomes 0.001 M after 5 minutes. Rate constant for the reaction in min^{-1} is
(1) 0.2303
(2) 1.3818
(3) 0.9212
(4) 0.4606

38. In the neutral or faintly alkaline medium, KMnO4 oxidises iodide into iodate. The change in oxidation state of manganese in this reaction is from
(1) +6 to +5
(2) +7 to +4
(3) +6 to +4
(4) +7 to +3

39. A 10.0 L flask contains 64 g of oxygen at 27°C. (Assume O_2 gas is behaving ideally). The pressure inside the flask in bar is (Given R = 0.0831 L bar K^{-1} mol^{-1})
(1) 4.9
(2) 2.5
(3) 498.6
(4) 49.8

40. Given below are two statements:
Statement I: In Lucas test, primary, secondary and tertiary alcohols are distinguished on the basis of their reactivity with conc. HCl + $ZnCl_2$, known as Lucas Reagent.
Statement II: Primary alcohols are most reactive and immediately produce turbidity at room temperature on reaction with Lucas Reagent.
In the light of the above statements, choose the most appropriate answer from the options given below:

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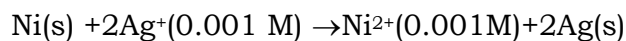**EDify Study Center (Expertise in school Exams)**

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(1) Statement I is incorrect but Statement II is correct
(2) Both Statement I and Statement II are correct
(3) Both Statement I and Statement II are incorrect
(4) Statement I is correct but Statement II is incorrect

41. $3O_2(g) \leftrightharpoons 2O_3(g)$
for the above reaction at 298 K, K_C is found to be 3.0×10^{-59}. If the concentration of O_2 at equilibrium is 0.040 M then concentration of O_3 in M is
(1) 1.2×10^{21}
(2) 4.38×10^{-32}
(3) 1.9×10^{-63}
(4) 2.4×10^{31}

42. Match List-I with List-II.

List-I (Ores)	List-II (Composition)
(a) Haematite	(i) Fe_3O_4
(b) Magnetite	(ii) $ZnCO_3$
(c) Calamine	(iii) Fe_2O_3
(d) Kaolinite	(iv) $[Al_2(OH)_4Si_2O_5]$

Choose the correct answer from the options given below:
(1) (a)-(i), (b)-(iii), (c)-(ii), (d)-(iv)
(2) (a)-(i), (b)-(ii), (c)-(iii), (d)-(iv)
(3) (a)-(iii), (b)-(i), (c)-(ii), (d)-(iv)
(4) (a)-(iii), (b)-(i), (c)-(iv), (d)-(ii)

43. Copper crystallises in fcc unit cell with cell edge length of 3.608×10^{-8} cm. The density of copper is 8.92 g cm^{-3}. Calculate the atomic mass of copper.
(1) 65 u
(2) 63.1 u
(3) 31.55 u
(4) 60 u

44. The correct IUPAC name of the following compound is
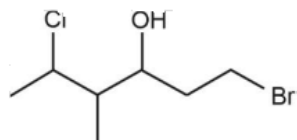
(1) 6-bromo-4-methyl-2-chlorohexan-4-ol

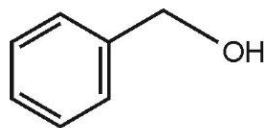**FOR GROUP TUITIONS (Classes 1 to 12th)**

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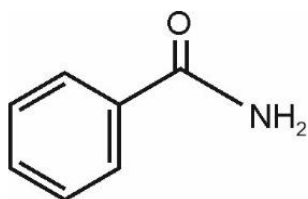
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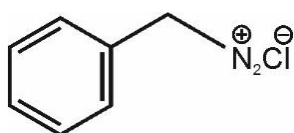
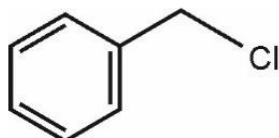FOR FURTHER DETAILS CONTACT Neelesh Sir (9898966050) or
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(2) 1-bromo-5-chloro-4-methylhexan-3-ol
(3) 6-bromo-2-chloro-4-methylhexan-4-ol
(4) 1-bromo-4-methyl-5-chlorohexan-3-ol

45. Find the emf of the cell in which the following reaction takes place at 298 K
Ni(s) +2Ag$^+$(0.001 M) →Ni^{2+}(0.001M)+2Ag(s)
(Given that E^0_{cell} = 10.5 V, $\frac{2.303RT}{F}$ = 0.059 at 298K)
(1) 1.05 V
(2) 1.0385 V
(3) 1.385 V
(4) None

46. The order of energy absorbed which is responsible for the color of complexes
(A) [Ni(H$_2$O)$_2$(en)$_2$]$^{2+}$
(B) [Ni(H$_2$O)$_4$(en)]$^{2+}$ and
(C) [Ni(en)$_3$]$^{2+}$
is
(1) (B) > (A) > (C)
(2) (A) > (B) > (C)
(3) (C) > (B) > (A)
(4) (C) > (A) > (B)

47. Which one of the following is not formed when acetone reacts with 2-pentanone in the presence of dilute NaOH followed by heating?
(1)
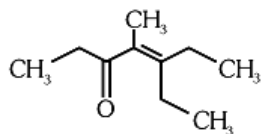
(2)
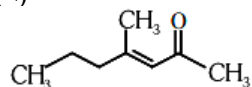
(3)

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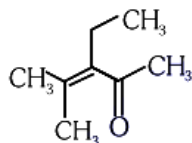
(4)
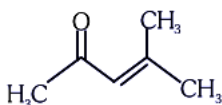
48. If radius of second Bohr orbit of the He+ ion is 105.8 pm, what is the radius of third Bohr orbit of Li^{2+} ion?
(1) 158.7 Å
(2) 158.7 pm
(3) 15.87 pm
(4) 1.587 pm

49. The pollution due to oxides of sulphur gets enhanced due to the presence of:
(a) particulate matter   (b) ozone
(c) hydrocarbons   (d) hydrogen peroxide
Choose the most appropriate answer from the options given below:
(1) (a), (c), (d) only
(2) (a), (d) only
(3) (a), (b), (d) only
(4) (b), (c), (d) only

50. The product formed from the following reaction sequence is

(1)

(2)

(3)

(4)

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Solution

1(1) Thermosetting polymers are NOT reusable.

2(1)
SRP : $E^0_{Zn^{2+}/zn} < E^0_{Fe^{2+}/Fe} < E^0_{cu^{2+}/cu} < E^0_{Ag^+/Ag}$
Reactivity order : Zn>Fe>Cu>Ag
In case of displacement reaction, more reactive metals (lower SRP) can displace less reactive metals (higher SRP) from their salt solution.
$CuSO_{4(aq.)} + 2Ag_{(s)} \rightarrow Cu_{(s)} + Ag_2SO_{4(aq.)}$
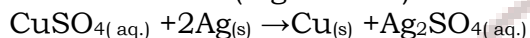
3(2)
IUPAC nomenclature
119→ Ununennium → Uue

4(4)
According to Hardy Schulze Rule statement 1 is correct. (Generally, the greater the valence of the flocculating ion added, the greater is its power to cause precipitation)
According to Hardy Schulze Rule statement 2 is

5(1)
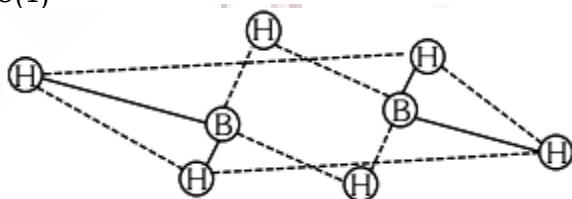
B has sp3 Hybridisation Non – planar

6(2)
Correct answer is (d) RCOO⁻Mg⁺X

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7(3)

$CaCO_{3(s)} + 2HCl_{(aq.)} \rightarrow CaCl_{2\,(aq.)} + CO_{2(a)} + H_2O_{(0)}$
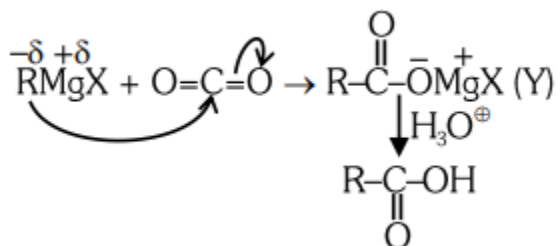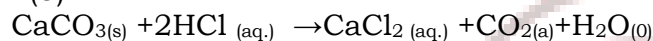
no. of moles of $CaCO_3$ (pure) = ½ × mole of HCl
 [Mole = molarity × volume(in ltr.)]
= ½ × ×0.5× $\frac{50}{1000}$
= 0.0125
weight of $CaCO_3$(pure) = mole × mol. wt
$\qquad\qquad$ =0.0125×100=1.25g
% purity = $\frac{wt\ of\ substance}{wt\ of\ impure\ sample}$× 100
 95 $\qquad$ = $\frac{1.25}{wt\ of\ impure\ sample}$× 100

wt. of impure sample = $\frac{1.25 X 100}{95}$× 100 =1.32g

8(1) O_2^+ ion is diamagnetic

1. Electronic configuration of ion is O_2^+ ion is
σ2s^2 σ*2s^2 σ2P_2^2 $(\pi_2 P_x^2 = \pi_2 y^2)$π*2P$\frac{1}{x}$π*2$P_y^0$
It has one unpaired electron so it is para-magnetic.
2. The bond orders of O_2^+, O_2 and O_2^- are 2.5, 2, 1.5 and 1, respectively
3. Electronic configuration of C_2 molecule is (σ 1s^2) (σ*1s^2) (σ2s^2) (σ*2s^2) ($\pi2P_x^2 = $ π2Py^2)
Hence it has 4 electrons in π molecular orbitals.
4. Bond orders of and are and respectively.

9(1)

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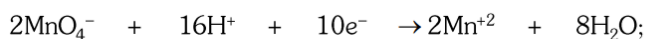**visit any of our center (near your house)**

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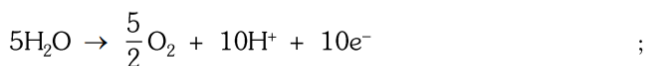
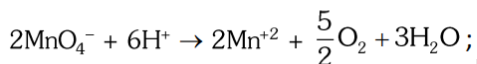FOR FURTHER DETAILS CONTACT Neelesh Sir (9898966050) or
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XeF_2 has the maximum number of lone pairs of electrons. Number of lone pair of electrons for XeF_2 is 3 .

10(4)
In diamond each carbon is bonded with four other carbon atoms. So hybridisation of carbon atom is sp^3.
In graphite each carbon is bonded with three other carbon atoms. So hybridisation of carbon atom is sp^2.

11(2)
i) Statement-1 is correct because in point defects of ionic solid electrical neutrality is essential condition (given question is example of metal deficiency defect)
(ii) Statement-2 is correct because In Frenkel defect cation dislocate from lattice site to interstitial position.
(iii) Both statement are correct but statement-2 is not correct explanation of statement-1

12(1)
Li - Electrochemical cells
Na - Coolant in fast breeder reactors
KOH - absorbent for CO_2
Cs - Photoelectric cell.

13(2)

$$MnO_4^- + 8H^+ + 5e^- \xrightarrow{\text{Reduction}} Mn^{+2} + 4H_2O \ ;$$
$$E^\circ_{MnO_4^-/Mn^{+2}} = 1.510V$$
$$\frac{1}{2}O_2 + 2H^+ + 2e^- \xrightarrow{\text{Reduction}} H_2O \qquad ; E^\circ_{O_2/H_2O} = 1.223V$$

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Cathode :

$$2MnO_4^- \ + \ 16H^+ \ + \ 10e^- \ \rightarrow 2Mn^{+2} \ + \ 8H_2O;$$
$$E_{RP}^o = 1.510V$$

Anode :

$$5H_2O \ \rightarrow \ \frac{5}{2}O_2 \ + \ 10H^+ \ + \ 10e^- \qquad\qquad ;$$
$$E_{OP}^o = -1.223V$$

Target reaction :

$$2MnO_4^- + 6H^+ \rightarrow 2Mn^{+2} + \frac{5}{2}O_2 + 3H_2O \ ;$$
$$E_{cell}^o = (SRP)_{Cathode} - (SRP)_{Anode}$$
$$E_{Cell}^o = 1.510V - 1.223 \ V$$
$$= 0.287 \ V$$

Yes the given cell reaction is possible.

14(2)
Electron deficient hydride → Less than 8e (B_2H_6)
Electron precise hydride → having 8e- without I.p. (GeH_4)
Electron rich hydride → having 8e- with 1.p. (HF)

15(1)
Acidic strength of phenolic group increases due to electron withdrawing groups.
Order of acidic strength
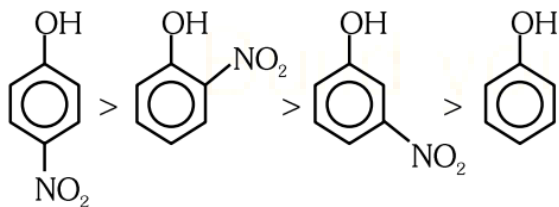
16(3)
Antacid - Cimetidine
Antihistamine - Seldane
Analgesic - Morphine
Antimicrobials - Salvarsan

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17(4)
(i) Like chemical catalysts enzymes reduce the activation energy of bio process ⇒ This is **correct** statement.
(ii) Enzymes are polysaccharides ⇒ This is incorrect statement because enzymes are protein in nature
(iii) Enzymes are very specific for a particular reaction and substrate ⇒ This is correct statement.
(iv) Enzymes are biocatalyst ⇒This is correct statement.

18(1)
The shapes of d_{xy}, d_{yz} and d_{zx} orbitals are similar to each other; and $d_{x^2-y^2}$ and d_{z^2} are similar to each other.
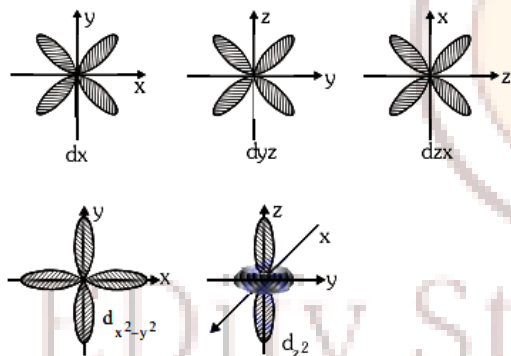
20(1)
For a compound to be aromatic, it must be cyclic, planar, conjugated, and contain $4n+2$ π electrons. The number of π electrons in A is 8 which violates the $4n+2$ rule and hence it is not aromatic(in-fact it is anti-aromatic)

21(4)
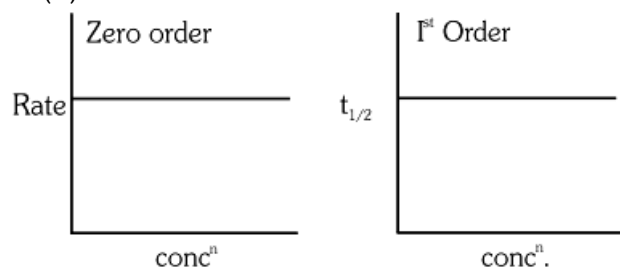
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(i) curve is suitable for zero order if y = rate and x = concentration because in case of zero order reaction rate is constant and does not depend on concn.
(ii) curve is suitable for first order if y = $t_{1/2}$ and x = concn because in case of first order $t_{1/2}$ does not depend on concn.

22(1)
Dalton's law of partial pressure :
Partial pressure of gas = mole fraction of gas in gaseous mixture × Total pressure of gaseous mixture.
$p_1 = X_1 p$
$p_2 = X_2 p$
$p_3 = X_3 p$
Total pressure,
$p = p_1 + p_2 + p_3$

23(4)
Correct answer is (d) Statement I is correct but Statement II is incorrect.

$$R-NH_2 \xrightarrow{HNO_2} R-N_2^{\oplus}$$

Alkyl diazonium ion
(unstable)

Aryl diazonium ion stable at low temperature (0–5℃)

24(3)
KO_2

$K^+ \ O_2^-$ (O_2^- – superoxide ion)
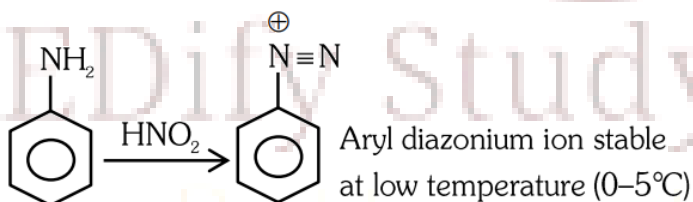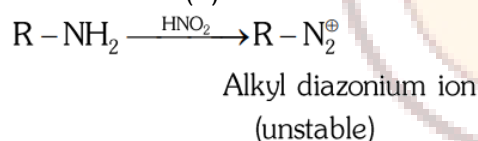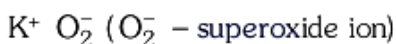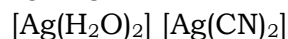
25(1)
IUPAC
$[Ag(H_2O)_2] [Ag(CN)_2]$
Coordination number = 2, Oxidation state = Ag^{+1}

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Diaquasilver (1) dicyanidoargentate (I)

26(2)
Weak acid (CH_3COOH) and salt of weak acid-strong base (CH_3COONa) form an acidic buffer. Sodium acetate (CH_3COONa) = 0.10 M; Acetic acid (CH_3COOH) = 0.01 M; pH of acidic buffer solution is given by

$$pH = pK_a + \log \frac{[Salt]}{[Acid]}$$

$$= 4.57 + \log\left(\frac{0.1}{0.01}\right)$$

$$= 5.57$$

27(3)
In P−V graph area under the curve represent magnitude of work.

28(1)
Correct answer is (a) (a) - (iv), (b) - (iii), (c) - (ii), (d) - (i)
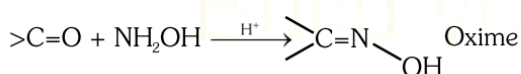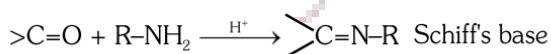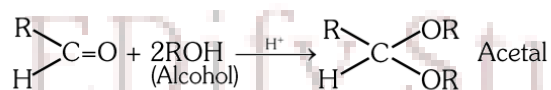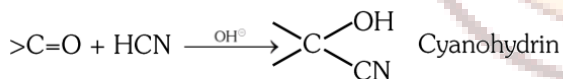
29(3)
Correct answer is (c) Phenol, $NaNO_2$, HCl, CuCl
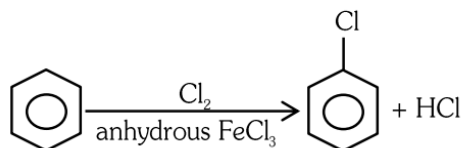
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30(4)

NH$_2$
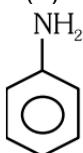
Kjeldahl's method is not applicable to the compounds containing nitrogen having nitro and azo group and nitrogen present in the ring (pyridine), as nitrogen of these compounds does not change to ammonium sulphate under these conditions.
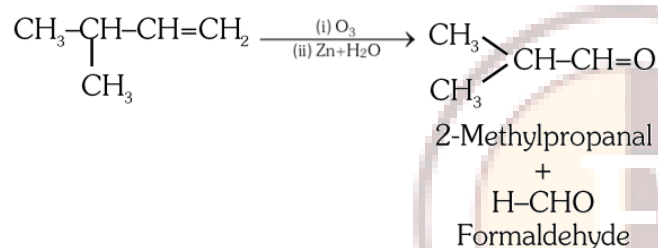
31(2)
Boiling point of comparable molecular mass molecules
R-OH - > Aldehyde - Ketone > Alkane
H-bonding Dipole-dipole interaction Non-polar strong molecular (weak molecular association)

32(1)
Hydrides of group 16th

$$\underset{\text{H-bond}}{H_2O} \quad \underbrace{H_2S \quad H_2Se \quad H_2Te}_{\text{H-bond}}$$
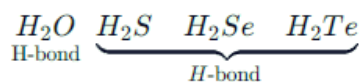
B.P. $\rightarrow H_2S < H_2Se < H_2Te < H_2O$

33(3)

$$m = \frac{moles\ of\ solute}{weight\ of\ solvent\ (g)} \times 1000$$

$$1 = \frac{0.5}{weight\ of\ solvent\ (g)} \times 1000$$

Weight of solvent (g)=500g

34(2)
Interhalogen compound group 17th

ICl is more reactive due to polar bonds.
From NCERT - X-X' bond is weaker than X−X bond except F$_2$

35(3)

$_{64}Gd=[Xe]6s^2 4f^7 5d^1$

$Gd^{+2} =[Xe]4f^7 5d^1$

After losing 5d electron 4f has maximum exchange energy so Gd has low value of Third Ionisation energy

36(2)
Correct answer is (b) 3-Methylbut-1-ene

$$CH_3-CH-CH=CH_2 \xrightarrow[\text{(ii) Zn+H}_2\text{O}]{\text{(i) O}_3} $$

with CH_3 group below, producing:

$$CH_3 \diagdown CH-CH=O$$

2-Methylpropanal
+
H–CHO
Formaldehyde

37(3)
A → Products
Initial conc. A_0 = 0.1M
Conc. After 5min A_t= 0.001M
t=5min.
For first order reaction
$K= \frac{2.303}{t}\log\left(\frac{A_0}{A_t}\right)$
$= \frac{2.303}{t}\log\left(\frac{0.1}{0.001}\right)$
$K=0.9212 min^{-1}$

38(2)
Correct answer is (b) +7 to +4

$$KMnO_4 + I^- \xrightarrow[\text{or weak alkaline medium}]{\text{Neutral}} MnO_2 + IO_3^-$$
$\underset{+7}{\downarrow} \qquad\qquad\qquad\qquad \underset{+4}{\downarrow}$

Change +7 to +4

39(1)
V=10L

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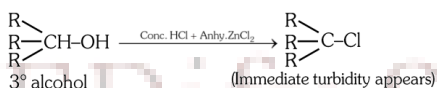
W_{O_2} =64g
T=2^0C
n_{O_2} =2
R=0.083.L bar K^{-1}mol $^{-1}$

Ideal gas equation PV=nRT
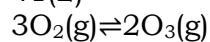P= $\frac{2 \times 0.0831 \times 300}{10}$
P=4.9 bar

40(4)
1^0 ,2^0,3^0 Alcohol are distinguished by Lucas test on the basis of the time taken for turbidity to appear
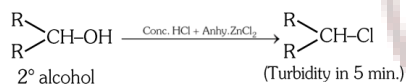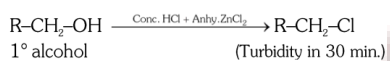
Reactivity of alcohol towards Lucas reagent

$\Rightarrow 3^0 > 2^0 > 1^0$ Alcohol

41(2)
$3O_2(g) \rightleftharpoons 2O_3(g)$
$K_c = \frac{[O_3]^2}{[O_2]^3}$
$3 \times 10^{-59} = \frac{[O_3]^2}{(4 \times 10^{-2})^3}$

$[O^3]_2$ =$3 \times 10^{-59} \times 64 \times 10^{-6}$

=19.2×10^{-64}
=4.38×10^{-32}

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42(3)
Haematite Fe_2O_3
Magnetite Fe_3O_4
Calamine $ZnCO_3$
Kaolinite $[Al_2(OH)_4Si_2O_5]$
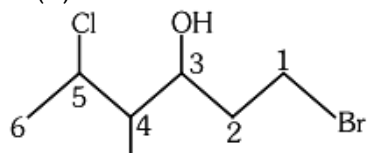
43(2)
$d = \dfrac{Z \times M}{N_A \times a^3}$

$8.92 = \dfrac{4 \times M}{6.022 \times 10^{23} \times (3.608 \times 10^{-8})^3}$

$M = \dfrac{8.92 \times 6.022 \times 10^{23}}{4} \times 46.96 \times 10^{-24}$
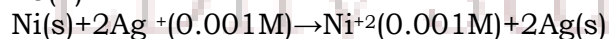
M=63.1g/mol (Molar Atomic Mass)
M=63.1u (Atomic Mass)

44(2)

1-Bromo-5-chloro-4-methylhexan-3-ol

45(4)
$Ni(s) + 2Ag^+ (0.001M) \rightarrow Ni^{+2}(0.001M) + 2Ag(s)$

$E_{cell} = E^0_{cell} - \dfrac{0.059}{2} \log \dfrac{[Ni^{+2}]^1}{[Ag^+]^2}$

$E_{cell} = 10.5 - \dfrac{0.059}{2} \log 10^{+3}$

$\quad = 10.5 - \dfrac{0.059}{2} \log 10^{+3}$

$\quad = 10.5 - \dfrac{0.059}{2} \times 3$

$\quad = 10.4115V$

46(4)
(A) $[Ni(H_2O)_2(en)_2]^{2+}$ (B) $[Ni(H_2O)_4,(en)]^{2+}$ (C) $[Ni(en)_3]^{2+}$ en is SFL (strong field ligand)
As the number of en (strong ligand) increase splitting also increases.
So, Δ_0 increases.
i.e. maximum energy will be absorbed in case of option C.

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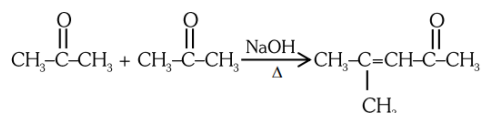
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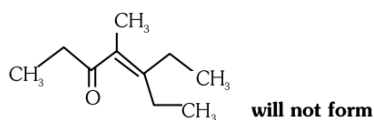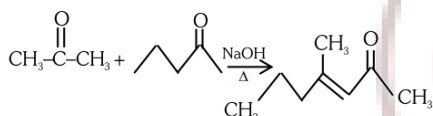FOR FURTHER DETAILS CONTACT Neelesh Sir (9898966050) or
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So the order is C > A > B

47(1)

Self aldol

Cross Aldol

will not form

48(2)
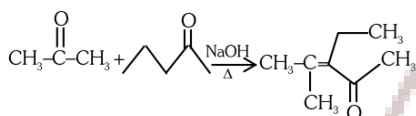
Acc. to Bohar's atomic model

$$r \propto \frac{n^2}{z}$$

3rd orbit of Li^{+2} $n_1 = 3$
       $Z_1 = 3$

2nd orbit of He^+ $n_1 = 2$
       $Z_1 = 2$

$$\frac{(r_3)_{Li^{+2}}}{(r_2)_{He^+}} = \frac{n_1^2}{n_2^2} \times \frac{Z_2}{Z_1}$$

$$\frac{(r_3)_{Li^{+2}}}{105.8pm} = \frac{3 \times 3}{2 \times 2} \times \frac{2}{3}$$

$(r_3)_{Li^{+2}}$ = 158.7 pm

49(3)

The presence of particulate matter in polluted air catalyses the oxidation of sulphurdioxide to sulphur trioxide.

$2SO_2(g) + O_2(g) \rightarrow 2SO_3(g)$

The reaction can also be promoted by ozone and hydrogen peroxide.

$SO_2(g) + O_3(g) \rightarrow SO_3(g) + O_2(g)$

$SO_2(g) + H_2O_2(l) \rightarrow H_2SO_4(aq)$

50(1)

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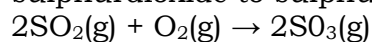**visit any of our center (near your house)**

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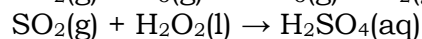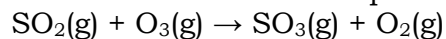**EDify Study Center (Expertise in school Exams)**

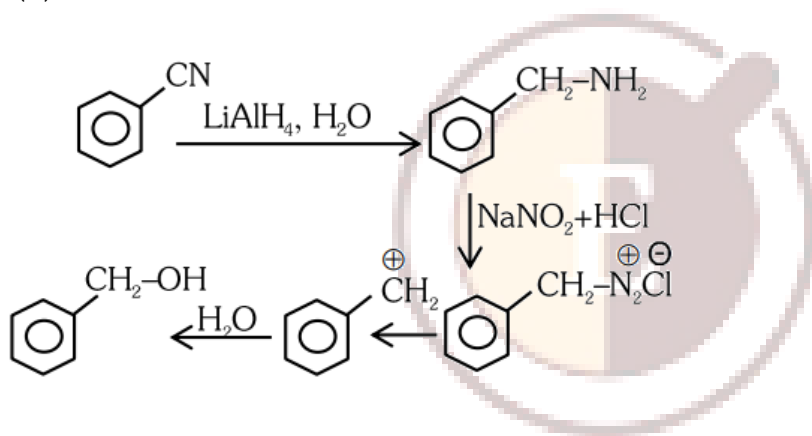FOR FURTHER DETAILS CONTACT Neelesh Sir (9898966050) or
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