

KEY ANSWERS

1 : (a)	13:(b)	25: (a)	37: (c)	49: (b)
2 : (d)	14:(b)	26: (c)	38: (c)	50: (c)
3: (d)	15: (c)	27: (c)	39: (d)	51: (b)
4: (b)	16:(c)	28: (a)	40: (b)	52: (d)
5: (c)	17:(d)	29: (d)	41: (d)	53: (c)
6: (c)	18: (b)	30: (b)	42: (c)	54: (d)
7:(b)	19: (a)	31: (a)	43: (d)	55: (c)
8:(c)	20: (b)	32: (c)	44: (b)	56: (d)
9:(a)	21: (a)	33: (a)	45: (a)	57: (c)
10: (c)	22: (b)	34: (a)	46: (d)	58: (b)
11:(c)	23: (d)	35: (c)	47: (b)	59: (a)
12:(d)	24: (a)	36: (c)	48: (b)	60: (c)

MOCK CET 2012
Answer Key

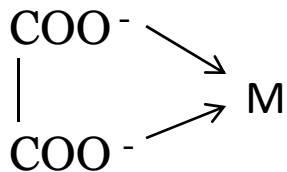
1. a) Group 14 elements having general electronic configuration $nS^2 nP^2$.
i.e. +2 and +4 oxidation state is possible
2. d) Gold dissolves in NaCN solution in presence of atmospheric oxygen to form aurocyanide.
3. d) Xe is large atom that can donate electron pair and oxygen is highly electronegative atom. therefore most of the compounds of rare gases are those of Xe with oxygen.

4. b)

Configuration	No. of unpaired electrons	Magnetic moment (B.M)
3d ²	2	2.76
3d ³	3	3.86
3d ⁸	2	3.1
3d ⁹	1	1.9

$\mu = \sqrt{n(n+2)}$: more no. of unpaired electrons having larger magnetic moment

5. c) oxalato ion having 2 lone pair of electrons.



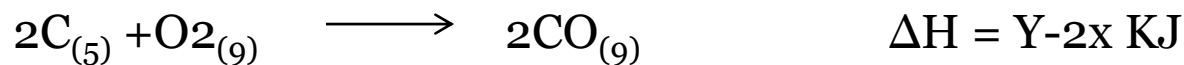
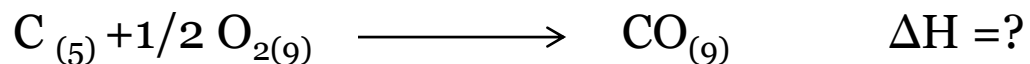
6. c) $[\text{OH}^-] = C\alpha$ $\alpha = 5/100 = 0.05$ $C = 0.01\text{M}$
 $[\text{OH}^-] = 0.05 \times 0.01$
 $= 0.0005\text{M}$

7. b)

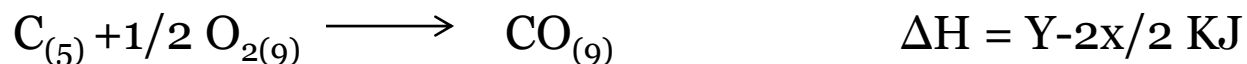
Bond angle: $\text{CH}_4 = 109^\circ - 28'$; $\text{BF}_3 = 120^\circ$; $\text{NH}_3 = 107.5^\circ$; $\text{H}_2\text{O} = 104.5^\circ$

8. c)

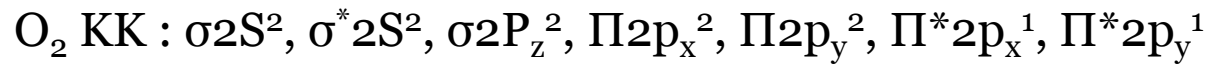
Required equation:



or



9. a) Oxygen molecule contain 2 unpaired electrons which shows paramagnetic properties.



$$\begin{aligned} \text{Bond order} &= \frac{1}{2} [\text{no. of electrons in BMO} - \text{no. of electrons in ABMO}] \\ &= \frac{1}{2} [8-4] \\ &= 4/2 \\ &= 2 \end{aligned}$$

10. c) $C = \sqrt{3RT/M}$ for ozone $C_1 = \sqrt{3RT/M_1}$

$$\text{for oxygen } C_2 = \sqrt{3RT/M_2}$$

$$\begin{aligned} C_1/C_2 &= \sqrt{3RT/M_1} / \sqrt{3RT/M_2} \\ &= \sqrt{1/M_1} / \sqrt{1/M_2} \\ &= \sqrt{(1/M_1) \times (M_2/1)} \\ &= \sqrt{32/48} \\ &= \sqrt{2/3} \end{aligned}$$

11. c)
for butter dispersed phase : liquid
and dispersion medium : solid

12. d)

13. b)

Explanation: $\log(K_2/K_1) = E_a/2.303R [(T_2-T_1)/T_1T_2]$

If $E_a = 0$, K_2/K_1 should be =1

i.e. $K_2=K_1$

Therefore $K_2=2.1 \times 10^6 \text{ sec}^{-1}$ & $K_1=2.1 \times 10^6 \text{ sec}^{-1}$

14. b)

Equivalent weight of oxalic acid = 63

Weight of oxalic acid present in 500cm³ = (normality x eq. wt)/ 2
= (0.2 x 63)/2 = 6.3 g

15. c) Explanation:

No. of moles in 16 g of oxygen = $16/32 = 0.5$

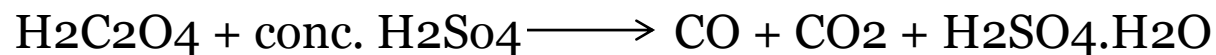
No. of moles a > $16/48 = 0.33$ b > $16/64 = 0.25$ c > $32/64 = 0.5$

i.e. 32g of SO₂ contains same number of molecules as 16 g of oxygen.

16. c) Explanation : $\text{Al}(\text{OH})_3 = 10^{-33}$; $\text{Ca}(\text{OH})_2 = 10^{-6}$
 $\text{Fe}(\text{OH})_2 = 10^{-14}$; $\text{Mg}(\text{OH})_2 = 10^{-11}$

Higher solubility product indicates higher solubility of the substance.

17. d) Explanation:



Liberated CO_2 which turns lime water milky.

18. b) Explanation:

Natural semipermeable membrane like vegetable membrane which are imperfect semipermeable membranes because they allow certain types of solute molecules to pass through them.

19. a) Explanation: Disorderliness are less in ice. therefore entropy is less.

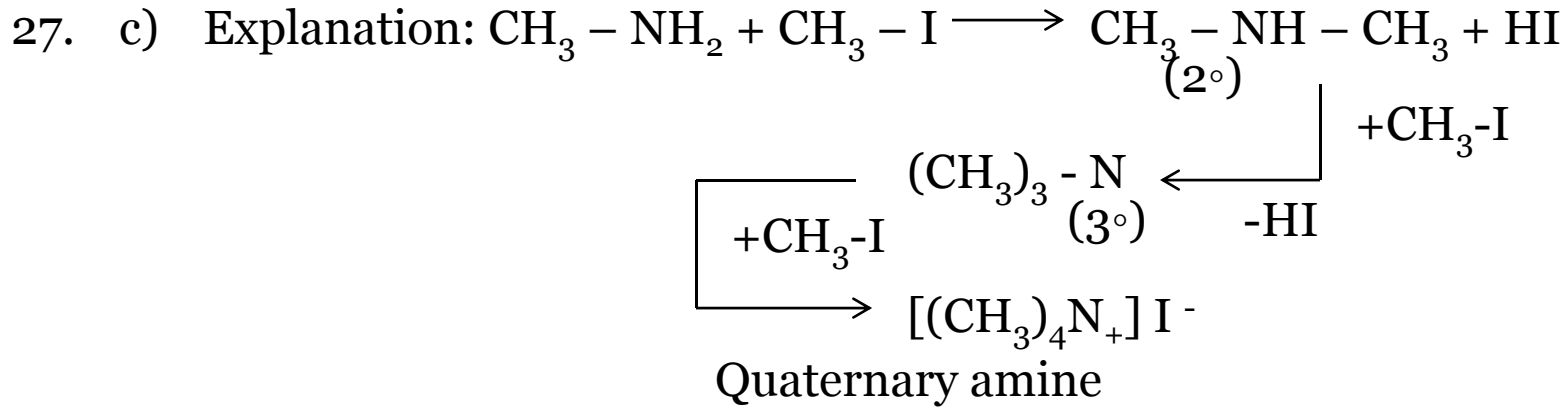
20. b) Explanation:

No. of solute particles = n

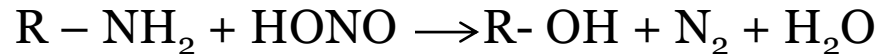
No. of solvent particles = N

Mole fraction of solute = $n/(n+N)$

21. a) Explanation: Lower the pKa value stronger will be the acid.
22. b) Explanation: vander waal's equation $[P+a/V^2](v-b) = RT$ for 1 mole of real gas.
At low pressure and high temperature a/v^2 and b factor becomes negligible and equation reduced to ideal equation i.e. $Pv = RT$
23. d) Explanation: 0.414 – 0.732 radius ratio having coordination number '6' Example: rock salt (NaCl)
24. a) Explanation: Electron withdrawing effect of halo group increases as $I < Br < Cl < F$. Strength of acid increases and halo groups which are more acidic in nature than e^- releasing group.
25. a) $H_2C \overset{\overset{\Pi}{\parallel}}{\underset{\underset{\sigma}{\parallel}}{\parallel}} CH - CH \overset{\overset{\Pi}{\parallel}}{\underset{\underset{\sigma}{\parallel}}{\parallel}} CH - C \overset{\overset{\Pi}{\parallel}}{\underset{\underset{\sigma}{\parallel}}{\parallel}} C - H$
Therefore 4 Π bonds
26. c) Explanation: In phenol the resonance structure is more dominant than inductive effect.



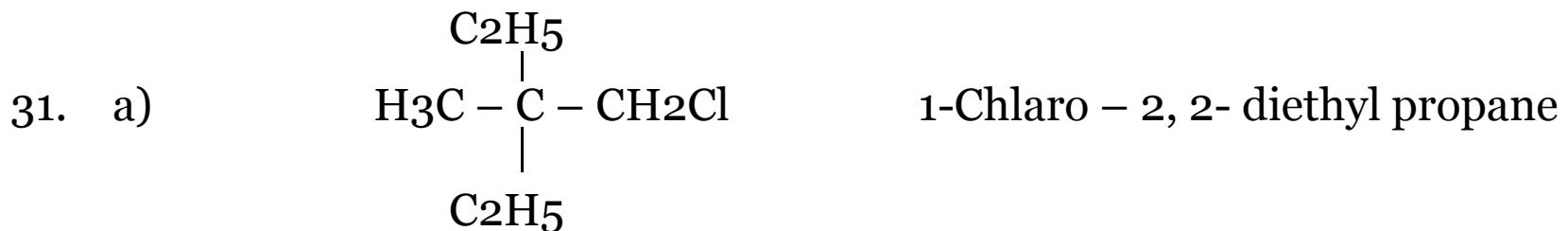
28. a) Explanation: Aliphatic primary amine forms a primary alcohol on reacting with nitrous acid



29. d) Explanation: For tetragonal crystal system

$$a=b \neq c ; \alpha = \beta = \gamma = 90^\circ$$

30. b)

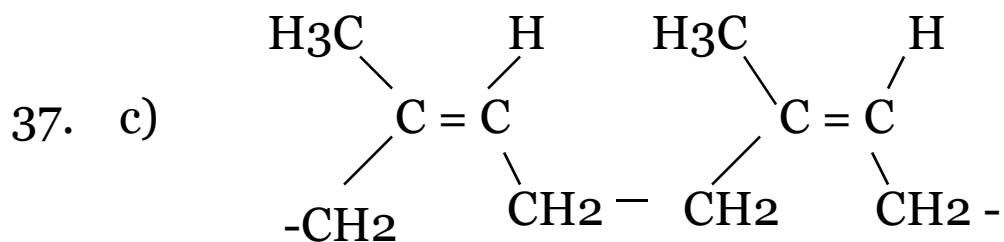
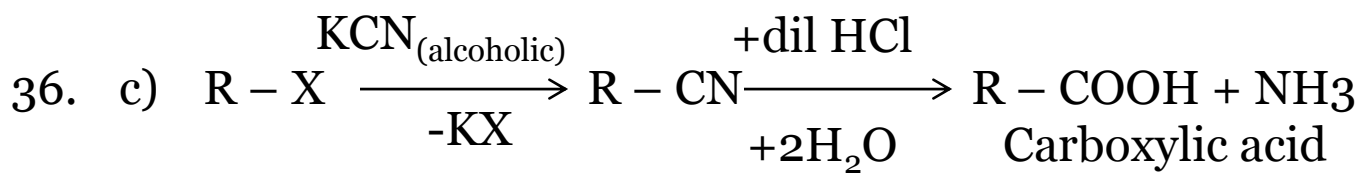


32. c)

33. a) cryolite : Na_3AlF_6

34. a) Explanation: NaOH is used for mercerising cotton fabrics in textile industry.

35. c) Explanation: Lauric acid, palmitic acid and stearic acid are saturated fatty acid. Oleic acid is unsaturated fatty acid.



Cis -1, 4 - polyisoprene

38. c) Explanation: Ninhydrin is answered by protein
Benedict's is answered by monosaccharides

39. d) Explanation: Aldehydes which do not have α - hydrogen atom
(HCHO and $C_6H_5 - CHO$) give cannizzaro's reaction.

40. b) Explanation:
$$C_6H_5 - \overset{\overset{O}{||}}{C} - CH(OH) C_6H_5$$

Benzoin (α - hydrogen ketone)

41. d) Explanation: Angle strain = $\frac{1}{2} [109^\circ 28' - 108^\circ] = 1^\circ 28' / 2$
 $= 0^\circ 88' / 2$
 $= 0^\circ 44'$

42. c) Explanation: The rusting of iron is $Fe \xrightleftharpoons{\hspace{1cm}} Fe^{2+} + 2e^-$ (oxidation)
 $H_2O + \frac{1}{2} O_2 + 2e^- \xrightleftharpoons{\hspace{1cm}} 2OH^-$ (reduction)

43. d)

44. b)

45. a) Explanation: Amino acids which cannot be synthesized in the human
body. They should supplied by protein diet Eg. Lysine

46. d

47. b.

Explanation :

Moles of NaOH = (mass / dm³) / mol.mass = (40 x 10⁻³/10) / 40 = 10⁻⁴m therefore [OH⁻] = 10⁻⁴m

But [H⁺] [OH⁻] = 10⁻¹⁴

[H⁺] = 10⁻¹⁴/10⁻⁴ = 10⁻¹⁰m P^H = - log [H⁺] = - log 10⁻¹⁰ = 10.0

48. b.

Explanation : + ΔG° = - 2.303 x RT x logk

ΔG° = - 2.303 x 2 x 300 x log 10² = - 2.303 x 2 x 300 x 2 = - 2.764 Kcal

49. b.

Starch which reacts with iodine and give blue colour. It helps to indicate the end point in iodometric titration

50. c.

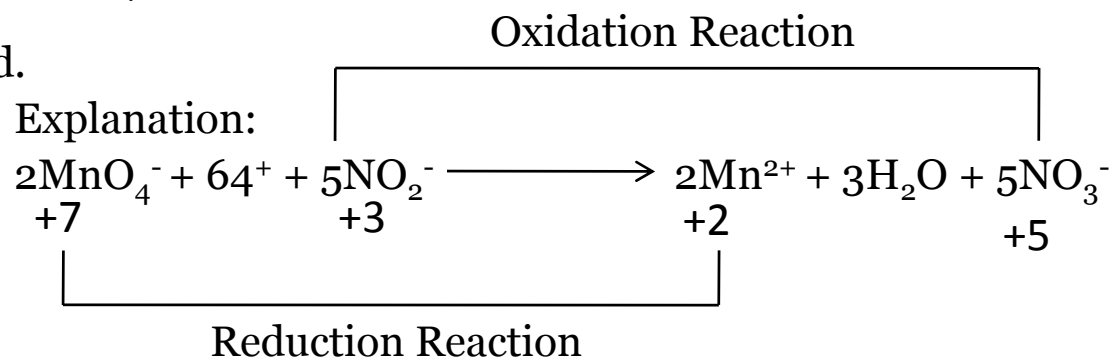
Element	% by mass	Atomic mass	% / Atomic mass		Simple ratio
X	50	10	50/10 = 5	5/2.5 = 20	2
Y	50	20	50/20 = 2.5	2.5/2.5 = 1	1

Simple formula X₂Y

51. b.

Cu SO₄ acts as a Catalyst

52. d.



Therefore All the above statements are correct

53. c.

Plot slopes downwards for the formation of CO

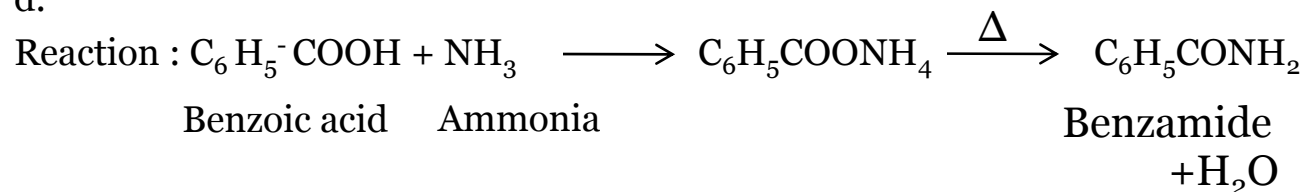
54. d.

Explanation: Cyclic compounds, oximes and alkenes are geometrical isomers

55. c.

Explanation: No. of unpaired electrons increases upto 3d⁵ and from 3d⁶ pairing of electrons starts and paramagnetic character decreases

56. d.



57. c.

Explanation:

Here $\text{Zn}^{2+} / \text{Cu}^{2+} = 100$ [Cu is +ve electrode and Zn is -ve electrode]

$$\begin{aligned} \text{Emf} &= (E^\circ_{\text{Cu}} - E^\circ_{\text{Zn}}) + 0.0591/2 \log \frac{\text{Cu}^{2+}}{\text{Zn}^{2+}} \\ &= 1.10 + 0.0591/2 \log 1/100 \\ &= 1.10 + 0.0591/2 \log 10^{-2} \\ &= 1.10 + 0.0591/2 (-2) \\ &= 1.10 - 0.0591 = 1.0409\text{V} \end{aligned}$$

Since $\text{Zn}^{2+} / \text{Cu}^{2+} = 100$

58. b.

For nth order, $t_{1/2} \propto 1/a^{n-1}$

For second order, $n = 2$, $t_{1/2} \propto 1/a^{2-1}$, That is $t_{1/2} \propto 1/a$

59. a.

No. of moles of urea = mass / molimass = 12 / 60 = 0.2 mol

No. of moles of sucrose = 68.4 / 342 = 0.2 mol

Since no. of moles is same in both cases, lowering of vapour pressure is same in both cases

60. c.

No. of electrons in bonding and anti – bonding molecular orbital is same and is equal to 2

Bond order = $N_b - N_a / 2 = 2 - 2 / 2 = 0$

Therefore no bond exists between He – atom