Hints And Tricks For Etea

1) Which one can form more acidic oxides?
A) Sc
B) Mn
C) Ti
D) V
Solution:
Mn is at the right side of the periodic table and also attain maximum oxidation state of +7. So Mn will form more acidic oxides among the above metals. Hence option B is correct.

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2) The number of peaks given by ethane thiol in NMR spectrum are
A) 2
B) 3
C) 4
D) None of the above
Solution:
As there are three different regions for hydrogens so three peaks will be given. Option B is correct.

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3) Which one is more soluble in water?
A) Secondary amines
B) Tertiary amines
C) Quaternary amines
D) All are insoluble
Option A is correct

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4) $C_4H_{11}N$ gives the type of isomerism
A) Metamerism
B) Tautomerism
C) Optical Isomerism

D) None of the above

Solution:

Metamerism is shown. Like

1) CH_3-CH_2-CH_2-NH-CH_3

2) CH_3-CH_2-NH-CH_2-CH_3

Option A is correct.

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5) Which of the following specie has maximum number of unpaired electrons?

A) O_2

B) $O2^{+2}$

C) O^{-2}

D) $O2^{-2}$

Solution:

Unpaired electrons in O_2=2

Unpaired electrons in $O2^{+2}$=0

Unpaired electrons in O^{-2}=0

Unpaired electrons in $O2^{-2}$=0

So option A is correct.

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6) A mixture of 10cm^3 of oxygen and 50cm^3 of hydrogen is sparked continuously. What is the maximum theoretical decrease in volume?

A) 10 cm^3

B) 15 cm^3

C) 20 cm^3

D) 30 cm^3

Solution:

$2H_2 + O_2 \longrightarrow 2H_2O$

Now

Total reactants Volume=10+50

Total reactants Volume=60cm^3

Similarly

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Total product Volume=20cm3
Volume used of Reactants=20+10
Volume used of reactants=30cm3
Remaining volume of reactants=60-30
Remaining volume of reactants=30cm
So
Total volume of the mixture=reactants + products
Total volume of the mixture=30+20
Total volume of the mixture=50cm3
Thus
Decrease in volume=60-50
Decrease in volume=10cm3
So option A is correct

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7) Hydration of hydrocarbon gives carbonyl compound, the general formula of that hydrocarbon is
A) CnH2n+2
B) CnH2n
C) CnH2n-2
D) Both B and C
Solution:
Hydration of alkynes only produced carbonyl compound so the correct option is C

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8) The oxidation states of nitrogen in NH4NO3 are
A) -3 and +5
B) +5 and -3
C) -3 and -3
D) Zero
Solution:
NH4NO3-------> $NH4^{+1} + NO3^{-1}$
Now
$NH4^{+1}$

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N+4H=+1
N+4(+1)=+1
N+4=+1
N=-3
Similarly
$NO3^{-1}$
N+3(-2)=-1
N-6=-1
N=+5
Hence option A is correct

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9) Coordination number of [Co(en)2Cl2] is
A) -2
B) 6
C) 4
D) None of the above
Solution:
As "en" has four atoms attached to cobalt as it is bidentate ligands. While two chlorine are also attached so total 6 atoms are attached with cobalt. Thus 6 is the coordination number. Option B is correct

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10) An olefin "X" on ozonolysis gives CH3-CH2-CO-CH3 and CH3-CO-CH3. The IUPAC name of X is
A) 2-butene
B) 2, 3-dimetyl-2-pentene
C) 2-pentene
D) 1-hexene
Solution:
As total seven carbons are present on the product side. It mean the "X" must have seven carbons. Thus correct option is B. No need to further calculation.

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11) Which one of the following element has the largest

second ionization energy?
A) O
B) F
C) Na
D) Ne
Solution:
O=1s2, 2s2, 2p4--- Ground state
O^+1 = 1s2, 2s2, 2p3 ----1st ionized state

F=1s2, 2s2, 2p5——Ground state
F^+1=1s2, 2s2, 2p4 ——1st ionized state

Na=1s2, 2s2, 2p6, 3s1—Ground state
Na^+1=1s2, 2s2, 2p6 ----1st ionized state

Ne=1s2, 2s2, 2p6 -------Ground state
Ne^+1=1s2, 2s2, 2p5 ——1st ionized state

As half filled and complete filled orbitals are more stable. So oxygen has half filled orbitals while Na has complete filled after 1st ionization. Now complete filled is more stable than half filled thus Na has the highest second ionization energy. So option C is correct.

---

12) Which oxides of "K" contain more oxygen than its normal oxide?
A) Peroxides
B) Super oxides
C) Both contain equal quantity
D) None of the above
Solution:
1) Peroxide, K2O2
Molar mass=2×39+2×16
Molar mass=78+32

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Molar mass=110
Now
% of oxygen=32 ×100/110
% of oxygen=3200/110
% of oxygen=29.09%
2) Superoxide KO2
Molar mass=39+2×16
Molar mass=39+32
Molar mass=71
Now
% of oxygen=32×100/71
% of oxygen=45.07%
Thus option B is correct.

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13) Which ions are used as a catalyst in the reaction between per sulphate ions and iodine ions?
A) Lead
B) Iron
C) Copper
D) Chromium
Option B is correct

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14) Which one is stronger nucleophile?
A) C2H5O^-1
B) C2H5S^-1
C) Both are equal strong
D) None of the above
Solution:
As S is more electropositive and easily give electrons thus Option B is correct

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15) Consider the reversible reaction
N2 + 3H2 <-----> 2NH3 + heat
The yield of NH3 will be maximum at

A) High temperature and low pressure
B) High temperature and high pressure
C) Low temperature and low pressure
D) Low temperature and high pressure

Solution:

As the reaction is exothermic so low temperature will proceed the reaction in forward direction. As reactants moles are greater than product so high pressure will also proceed the reaction in forward direction. So option D is correct

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16) Which of the following concentration units is temperature dependant?

A) Molality
B) Mole fraction
C) Molarity
D) Both A and C

Hint:

Molarity has volume in its formula. That's why It is temperature dependant. So option C is correct.

---

17) Tertiary alcohols are not oxidized into carbonyl compounds because

A) They contain more alkyl groups
B) They have no alpha hydrogen
C) Suitable oxidizing agents are not available
D) None of the above

Reason:

As there is no alpha hydrogen in tertiary alcohols that's why they are not oxidized into carbonyl compounds. Option B is correct

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18) Which one is most reactive?

A) HCHO

B) CH_3CHO
C) $(CH_3)_2CO$
D) Have equal reactivity
Solution:
As aldehydes are more reactive than ketones. Now formaldehyde is most reactive among the other aldehydes so option A is correct.

---

19) Which of the following is not the major source of organic compounds?
A) Natural gas
B) Petroleum
C) Coal
D) Ammonical liquor
Option D is correct.

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20) Which of the following is not a state function?
A) Work
B) Enthalpy
C) Internal energy
D) Pressure
Option A is correct.

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21) How many elements are there in the 3rd period of periodic table?
A) 18
B) 8
C) 32
D) 10
Solution:
1st period=2
2nd period=8
3rd period=8
4th period=18

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5th period=18
6th period=32
7th period=32
So option B is correct.

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22) The number of isomers of pentane is
A) 2
B) 4
C) 5
D) 3
Option D is correct.
1) CH3-CH2-CH2-CH2-CH3
2) CH3-CH2-CH-CH3
|
CH3
CH3
|
3) CH3-CH-CH3
|
CH3

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23) When ammonium cyanide (NH4CN) salt is dissolved in water, the solution will be
A) Neutral
B) Acidic
C) Basic
D) Both B and C
Solution:
As CN^-1 is stronger as a base than NH4^+ as an acid. That why when NH4CN salt is dissolved in water the solution will be basic in nature. So option C is correct

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24) In the complex potassium hexacyanoferrate(III), K3[Fe(CN)6], the coordination number of Fe is

A) 9
B) 3
C) 6
D) 5

Solution:

Six molecules of CN are attached with Fe. So Fe has coordination number of 6. Option C is correct.

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25) The compound which has the highest boiling point of the following is

A) Methyl chloride
B) Methyl iodide
C) Methyl bromide
D) Both A and B

Solution:

As when size of the halogen increases by keeping the alkyl group constant, boiling point will also be increases. So Option B is correct.

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26) Which of the following is an addition polymer?

A) Nylon
B) PVC
C) Polyethene
D) Both B and C

Option D is correct.

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27) Photochemical smog is primarily caused by

A) O_3
B) NO_2
C) SO_3
D) CO_2

Option B is correct

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28) Which of the following pair is an example of

completely immiscible liquids?
A) Alcohol and water
B) Alcohol and ether
C) Water and ether
D) Carbon disulphide and water.
Hint:
Like dissolve like. As carbon disulphide is non polar while water is polar so these two are completely immiscible liquid. Option D is correct.

---

29) A molecule which contains two lone pairs and two bonds pairs of electrons in valence shell of central atom, geometrical shape of the molecule will be
A) Tetrahedral
B) Trigonal pyramidal
C) Angular
D) Linear
Solution:
As two bond pairs means two atoms will be attached thus
H= Lone pair + attached atoms
H= 2+2
H=4
It means molecule has sp3 hybridization.
When hybridization is sp3 and having two lone pairs then geometry will be Angular. So option C is correct.

---

30) Quantum number which describes the orientation of orbitals in three dimensional space is
A) Spin Q.No
B) Magnetic Q.No
C) Azimuthal Q.No
D) Principal Q.No
Here option B is correct

---

31) Which of the following gas has the highest rate of diffusion at the same temperature and pressure?
A) HCl
B) CO_2
C) C_2H_2
D) C_2H_6
Solution:
As rate of diffusion is inversely proportional to the square root of the molar mass. Higher the molar mass, lower will be the rate of diffusion and vice versa
Now
HCl=36.5 amu
CO_2=44 amu
C_2H_2=26 amu
C_2H_6=30 amu
So Option C is correct.

---

32) At higher altitude the boiling point of water is less than 100°C. This is because of
A) Higher atmospheric pressure
B) Weak hydrogen bonding
C) No change in atmospheric pressure
D) Lower atmospheric pressure
Hint:
Boiling point decreases at high altitudes due to lower atmospheric pressure. So option D is correct.

---

33) Substance that has sharp melting point in the following is
A) Gemstone
B) Coal tar
C) Glass
D) Diamond

Hint:
Crystalline substances have sharp melting points. Here Diamond is crystalline so it has sharp melting point. Option D is correct.

---

34) The enzyme which is found in saliva, accelerates the conversion of starch into sugar is
A) Pepsin
B) Thrombin
C) Ptyalin
D) Fumarase
Correct option is C

---

35) Which compound shows the highest boiling point?
A) CH_3COOH
B) C_2H_5OH
C) C_2H_5-O-C_2H_5
D) $(CH_3-CH_2)_3$-N
Solution:
Compounds having H.bonding will have highest boiling point. Here alcohol and carboxylic acid have hydrogen bonds. But hydrogen bonds are maximum in carboxylic acids. So option A is correct

---

36) Which of the following pollutant decolorize the skin?
A) Mercury
B) Arsenic
C) Lead
D) Cadmium
Correct option is B

---

37) As the polarizing power of the cation increases, thermal stability of carbonates

A) Increases
B) Decreases
C) Not dependent
D) Depends upon pressure
Solution:
Thermal stability of the carbonates are inversely proportional to the polarizing power of the cation. Greater the polarizing power of the cation, lesser will be the thermal stability and vice versa. So option B is correct

---

38) Ozone layer in the upper atmosphere is being destroyed by
A) Chlorofluorocarbon
B) Freon
C) Smog
D) Both A and B
Correct option is D

---

39) When zinc electrode is coupled with copper electrode in galvanic cell
A) Reduction takes place at zinc electrode
B) Oxidation takes place at copper electrode
C) Reduction takes place at copper electrode
D) Both A and B
Solution: As reduction potential of Zn is less than that of copper. There fore Zn will acts as an Anode while Copper acts as Cathode. At the Anode oxidation will occur while at the Cathode reduction will occur Thus Correct option is C

---

40) Which contains more atoms?
A) 7 grams Mg
B) 8 grams Na

C) 9 grams Al
D) All same
Solution:
As greater the number of moles, greater will be the atoms.
For Mg:
Moles=7/24
Moles=0.29
For Na:
Moles=8/23
Moles= 0.34
For Al
Moles=9/27
Moles=0.33
Thus Na has greater moles, so more atoms will be present in 8 grams of Na. Option B is correct

---

41) Which contains the highest percentage of nitrogen?
A) NO
B) NO_2
C) N_2O
D) N_2O_5
Solution:
% of nitrogen in NO= 14×100/30
% of nitrogen in NO= 46.66%
Similarly
% of nitrogen in NO_2= 14×100/46
% of nitrogen in NO_2= 30.43%
Similarly
% of nitrogen in N_2O= 28×100/44
% of nitrogen in N_2O= 63.73%
Similarly
% of nitrogen in N_2O_5=28×100/108
% of nitrogen in N_2O_5=29.52%

Thus Option C is correct

---

42) Fe^+2 will form the most ionic bond with
A) N^-3
B) S^-2
C) P^-3
D) F^-1
Solution:
As size of the anion increases, ionic character will be decreases. Here F^-1 has smaller size so it will form the most ionic bond with F2^+2. So correct option is D

---

43) Which of the following element has lowest first ionization energy?
A) N
B) O
C) C
D) B
Solution:
As I.E increases across the period so Boron has the lowest first Ionization energy. Option D is correct

---

44) A gas diffuse 1/2 times as fast as hydrogen, its molecular mass is
A) 50 amu
B) 25 amu
C) 16 amu
D) 8 amu
Solution:

$$\frac{r1}{r2} = \sqrt{\frac{M2}{M1}}$$

$$\frac{1}{\frac{1}{2}} = \sqrt{\frac{M2}{2}}$$

$2 = \sqrt{\frac{M2}{2}}$

Taking square on both sides, we get

4=M2/2

M2=8

Thus correct option is D

---

45) The anhydride of HClO4 is

A) ClO3

B) ClO2

C) Cl2O5

D) Cl2O7

Solution:

As HClO4 is the strong acid so it will form from the most acidic oxide. Cl2O7 is the most acidic oxide so Option D is correct.

Cl2O7 + H2O ----> 2HClO4

---

46) Consider reversibility in free radical substitution reaction of alkane then Kc value is smallest for

A) Initiation step

B) Propagation step

C) Termination step

D) All same

Correct option is A

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47) Ethylene diaminediacetate is

A) Didentate

B) Tridentate

C) Tetradentate

D) Hexadentate

Correct option is C

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48) Epoxide obtained from iso-butylene is further

hydrolysed in the presence of acid. The final product is
A) 2, 3-butandiol
B) 1, 2-butandiol
C) 2-methyl-1, 2-propandiol
D) All of them
Solution: By acid hydrolysis, epoxides give glycols. Here Iso-butylene is given so glycol will have three carbons in its chain thus correct option is C

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49) In the detection of nitrogen in the organic compound. The appearance of Prussian blue colouration is due to the formation of
A) $Fe_4[Fe(CN)_6]_3$
B) $Na_3[Fe(CN)_6]$
C) $K_3[Fe(CN)_6]$
D) None of the above
Option A is correct

---

50) The bond angle in H_2S is less than H_2O. It is due to
A) Small size of oxygen atom
B) Greater E.N of oxygen atom
C) Oxygen contains two lone pairs of electrons
D) All of the above
Solution:
When central atoms are different and surrounding atoms are same then bond angle will be greater for that molecule which has central atom of highest electronegativity and Vice versa. So Option B is correct.

---

51) The auxochrome not concern with Metanil yellow dye
A) $-SO_3H$
B) $-OH$
C) $-NH_2$

D) Both A and C
Correct option is C

---

52) Which one is more reactive?
A) Ester
B) Acid halide
C) Amide
D) Acid anhydride
Solution:
All are the derivatives of carboxylic acid. Acid halide is the most reactive while Amide is the least reactive.
Option B is correct

---

53) A gas decolorizes alkaline $KMnO_4$ solution but does not give any ppt with ammonical $AgNO_3$
A) Methane
B) Ethylene
C) Ethane
D) None of the above
Solution:
For the detection of double or triple bonds, beayer test is used which is alkaline $KMnO_4$ solution. If double or triple bonds are present then the solution will be decolorize. As Ethene and ethyne both gives this test but ethene does not give ppt while ethyne gives ppt with ammonical $AgNO_3$.Thus Option B is correct.

---

54) Why ethanoic acid is a stronger acid in the liquid ammonia than in water?
A) Ammonia is stronger base than water
B) Ethanoic acid molecules form H.bonding with water
C) Ethanoic acid is more soluble in liquid ammonia than in water
D) None of the above

Correct option is A

---

55) Which equation relates to the first ionization energy of bromine?

A) $Br \rightarrow Br^- + 1\bar{e}$

B) $Br \rightarrow Br^+ + 1\bar{e}$

C) $\frac{1}{2}Br_2 \rightarrow Br^- + 1\bar{e}$

D) $\frac{1}{2}Br_2 \rightarrow Br^+ + 1\bar{e}$

Option D is correct

---

56) For exothermic reversible reaction, activation energy for forward direction depends upon

A) Temperature

B) Nature of reactants

C) Nature of products

D) Both A and B

Correct option is B

---

57) Which one of the following ion has more electrons than protons and more protons than neutrons?

A) D

B) D^-

C) H^-

D) He

Solution:

As H^- has two electrons and one proton and Zero neutron thus Option C is correct

---

58) Ice and water is in equilibrium with each other. By increasing the pressure the equilibrium will shift in

A) Forward

B) Reverse

C) To all system at equilibrium

D) None of the above
Correct option is A

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59) Steam causes severe burn than boiling water. It is due to
A) Absence of hydrogen bond
B) High latent heat of vaporization
C) Freely moving molecules
D) Statement is wrong
Correct option is B

---

60) The incorrect statement regarding gas having high value of coefficient of attraction
A) Easy to be liquefied
B) Having higher critical temperature
C) Less soluble in water
D) None of the above
Solution:
When value of "a" is high then gases will have higher critical temperature, easy to be liquefied and will be more soluble in water. So
Option C is correct