CHEMISTRY

AAKASH INSTITUTE ENGLISH

MOCK TEST 37

Exercise

1. Order of reactivity of hydrogen halides towards ethers is

A. $HCl > HBr > HI$

B. $HI > HBr > HCl$

C. $HBr > HI > HCl$

D. $HBr > HCl > HI$

Answer: B

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2. The following reaction takes place through

$CH_3 - O - CH_2 - CH_3 + HI$ to

$CH_3 - I + CH_3 - CH_2 - OH$

A. S_N1 mechanism

B. S_N2 mechanism

C. S_N1 in first step and E2 in second step

D. S_N2 in first step and E1 in second step

Answer: B

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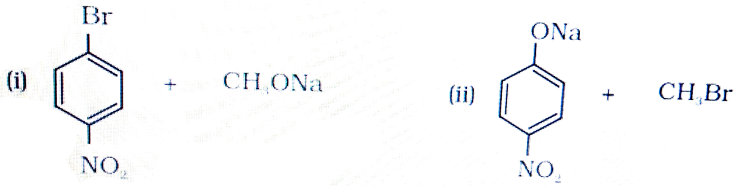
3. Which of the following is an appropriate set of reactants for the preparation of 1-methoxy-

4-nitrobenzene and why?



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4. The common name of Prop-2-enal is

A. Catechol

B. Acrolein

C. Vanillin

D. Valeraldelyde

Answer: B

5. For denaturation of ethanol

A. Copper sulphate is added to give colour and pyridine for foul smell

B. Nickel sulphate is added to give colour and aniline for foul smell

C. Copper sulphate is added to give colour and aniline for foul smell

D. Nickel sulphate is added to give colour and pyridine for foul smell

Answer: A

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6. In aldehydes and ketones

A. Carbonyl carbon is nucleophilic and carbonyl oxygen is electrophilic

B. Carbonyl carbon, is slectrophilic and carbonyl oxygen is nucleophilic

C. Both are electrophilic

D. Both are nucleophilic

Answer: B

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7. What is the molar solubility product for $V_3(PO_4)_5$ in terms of K_{SP}?

A. $S = \left(\frac{K_{SP}}{84375}\right)^{\frac{1}{8}}$

B. $S = \left(\frac{K_{SP}}{155}\right)^{\frac{1}{8}}$

C. $S = \left(\frac{K_{SP}}{108}\right)^{\frac{1}{8}}$

D. $S = (K_{SP})^{\frac{1}{8}}$

Answer: C

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8. If ethanol and chloroform are present in a molar ratio of 2:3 then what is the vapor pressure at 20^{o} C if vapor pressures of pure liquids are 5.95 kPa and 21.17 kPa, respectively?

A. 16.692 kPa

B. 15.082 kPa

C. 8.731 kPa

D. 12.038 kPa

Answer: C

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9. 5 moles of liquid X and 10 moles of liquid Y make a solution having a total vapour pressure 70 torr. The vapour pressures of pure X and pure Y are 64 torr and 76 torr respectively.Calculate the expected pressure.

A. 70 torr

B. 80 torr

C. 72 torr

D. 82 torr

Answer: A

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10. When 2.0 grams of copper (II) nitrate is added to 1000 ml of pure water, by how much is the vapor pressure of water decreased, given that at 20°C the vapor pressure of pure water is 17.535 mm Hg?

A. 0.303

B. 0.0333

C. 0.0033

D. 3.14×10^{-4}

Answer: B

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11. At 70°C the vapor pressure of pure water is 31 kPa. Which of the following is most likely the vapor pressure of a 2.0 molal aq. glucose solution at 70°C?

A. 30.001 kPa

B. 29.915 kPa

C. 28.226 kPa

D. 32.392 kPa

Answer: B

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12. 117 g of NaCl is added to 222 g of water in a saucepan. At what does temperature does water boil at 101.325 kPa? Ebullioscopy

constant for water = 0.52 K kg mol-1 and b.p. = 100°C

A. 98.3°C

B. 102.8°C

C. 104.7°C

D. 101.5°C

Answer: C

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13. Boiling point of chloroform is 61°C. After addition of 5.0 g of a non-volatile solute to 20 g chloroform boils at 64.63°C. If kb = 3.63 K kg mol-1, what is the molecular weight of the solute?

A. 320 g/mol

B. 100 g/mol

C. 400 g/mol

D. 250 g/mol

Answer: C

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14. Pure CS_2 melts at -112°C. 228 grams of propylene glycol crystals is mixed with 500 grams of CS_2. If k_f of $CS_2 = -3.83 K kg mol^{-1}$ what is the depression in freezing point?

A. 23°C

B. -135°C

C. -20°C

D. -100°C

Answer: D

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15. Addition of water to ethyne in the presence of H_2SO_4 and HgSO_4` gives

A. Acetone

B. Acetaldehyde

C. Formaldehyde

D. Glyoxal

Answer: B

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16. The given reaction is an example of

A. Stephen reaction

B. Rosenmund reduction

C. Etard reaction

D. Gattermann Koch reaction

Answer: B

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17. The van't Hoff factor of $BaCl_2$ at 0.01 M concentration is 1.98. The percentage of dissociation of $BaCl_2$ at this concentration is:

A. 49

B. 69

C. 89

D. 79

Answer: A

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18. n-Butyl bromide has higher boiling point than t-butyl bromide.

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19. The depression of freezing point of a solution of acetic acid in benzene is – 0.2°C. If the molality of acetic acid is 0.1 m, then find the ratio of the normal mass to the abnormal mass. (Assume Kf of acetic acid = 4.0°C m-1)

A. 1.5

B. 0.5

C. 0.8

D. 0.2

Answer: A

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20. The incorrect statement for aldehydes and ketones is

A. Methanal, ethanal and propanone are miscible in water

B. All aldehydes and ketones are fairly soluble in organic solvents like benzene, chloroform, etc.

C. Many naturally occurring aldehyde and ketones are used in the blending of perfumes

D. All aldehydes and ketones are fragrant

Answer: D

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21. The shape of the intermediate formed In nucleophilic addilion reaction of aldehydes and ketones is

A. Trigonal planar

B. Tetrahedral

C. Trigonal bipyramidal

D. Bent

Answer: B

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22. Ketones are generally less reactive than Aldehydes in nucleophilic addition reactions because

A. Carbonyl carbon in ketones is sterically more protected and more electrophilic

B. Carbonyl carbon in aldehydes is sterically more protected and more electrophilic

C. Carbonyl carbon in aldehydes is sterically less protected and less electrophilic

D. Carbonyl carbon in ketones is sterically more protected and less electrophilic

Answer: D

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23. Acetic acid associates as dimers in benzene. What is the Van't Hoff factor (i) if the degree of association of acetic acid is 50%?

A. 0.25

B. 0.50

C. 0.75

D. 0.40

Answer: C

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24. The pH of a 2 M solution of a weak monobasic acid (HA) is 4. What is the value of the Van't Hoff factor?

A. 0.00005

B. 1.05

C. 1.005

D. 1.00005

Answer: C

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25. In the given reaction, product formed is

$$CH_3CHO + HCN \longrightarrow CH_3CH(OH)CN$$

A. Laevorotatory

B. Racemic nixture

C. Meso compound

D. Dextrorotatory

Answer: B

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26. State true or false : red phosphorus less reactive than white phosphorus

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27. Which of the following conditions are satisfied when the cell reaction in the electrochemical cell is spontaneous?

A. $\Delta G^{o} > 0$

B. $E^{o}cell < 0$

C. $E^{o}cell = 0$

D. $\Delta G^{o} < 0$

Answer: B

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28. What is the EMF of a galvanic cell if $E^{o}cathode$ = 0.80 volts and $E^{o}anode$ = -0.76 volts?

A. 1.56 volts

B. 0.04 volts

C. -1.56 volts

D. -0.04 volts

Answer: C

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29. Tollen's reagent is

A. Aqueous copper sulphate

B. Alkaline sodium potassium tartarate

C. Ammoniacal silver nitrate

D. Ammoniacal silver chloride

Answer: C

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30. What is the standard reduction potential of the cathode of a galvanic cell if the standard EMF of the cell and the standard

reduction potential of the anode are 2.71 and -2.37 respectively?

A. 0.68 volts

B. -0.68 volts

C. -0.34 volts

D. 0.34 volts

Answer: C

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31. What is the EMF of a galvanic cell if the standard reduction potential of the reduction half-reaction is -0.38 volts and the standard reduction potential of the oxidation half-reaction is 0.52 volts?

A. -0.9 volts

B. -0.6 volts

C. 0.9 volts

D. 0.6 volts

Answer: B

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32. Who invented the galvanic cell?

A. Galvani and Volta

B. Henry Cavendish

C. Joseph Priestley

D. Antoine Lavoisier

Answer: A

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33. Calculate the e.m.f. of the half-cell given below. Pt, H2 | HCl at 1-atmosphere pressure and 0.1 M. Given, $E^{o}(OP) = 2$ V.

A. 4 V

B. 5.6 V

C. 3.4 V

D. 5.4 V

Answer: B

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34. What is the EMF of a galvanic cell if the standard oxidation potential of the oxidation half-reaction is 0.64 volts and the standard reduction potential of the reduction half-reaction is 0.48 volts?

A. 1.48 volts

B. 1.12 volts

C. 1.36 volts

D. 0.96 volts

Answer: C

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35. The standard oxidation potential of Ni/Ni2+ electrode is 0.3 V. If this is combined with a hydrogen electrode in acid solution, at what pH of the solution with the measured e.m.f. be zero at 25°C? (Assume [Ni2+] = 1M)

A. 5.08

B. 4

C. 4.5

D. 5.25

Answer: D

36. Equal amount of aqueous solution of $CuSO_4$ and alkaline sodium potassium tartarate is mixed and treated with aliphatic aldehyde, then

A. Red brown ppt of Cu_2O is formed

B. Red brown ppt of Cuo is formed

C. Blue ppt of CuO is formed

D. There will be no reaction

Answer: A

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37. Mixture of carboxylic acids oblained by the oxidation of hexan-3-one does not contain

A. Methanoic acid

B. Ethanoic acid

C. Propanoic acid

D. Butanoic acid

Answer: A

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38. Benzaldehyde can be oxidised to corresponding carboxylate anion with

A. Fehling's reagent

B. Tollen's reagent

C. Both Fehling's and Tollen's reagent

D. Neither Fehling's nor Tollen's reagent

Answer: B

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39. Calculate the equilibrium constant for the reaction $Fe + CuSO_4 \rightleftharpoons FeSO_4 + Cu$ at

25°C. (Given $E^{o}(OP/Fe) = 0.5\ V^{o}$, $E^{o}(OP/Cu) = -0.4$ V)

A. 3.46×10^{30}

B. 3.46×10^{26}

C. 3.22×10^{30}

D. 3.22×10^{26}

Answer: A

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40. PH3 forms bubbles when passed slowly in water but NH3 dissolves.$(T \text{ or } F)$

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41. The equilibrium constant for a cell reaction,

$Cu(g) + 2Ag^{+}(aq) \rightarrow Cu^{2+}(aq) + 2Ag(s)$

is 4×10^{16}. Find E^{o} (cell) for the cell reaction.

A. 0.63 V

B. 0.49 V

C. 1.23 V

D. 3.24 V

Answer:

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42. What is the correct Nernst equation for $M^{2+}(aq) + 2e^{+} \rightarrow M(s)$ at 45°C?

A. $E^{o}\left(\frac{M^{2+}}{M}\right) + 0.315 \log_{10}\left(\frac{1}{[M]^{+2}}\right)$

B. $E^{o}\left(\frac{M^{2+}}{M}\right) + 0.0425 \log_{10}\left(\frac{1}{[M]^{+2}}\right)$

C. $E^{\circ}\left(\frac{M^{2+}}{M}\right)+0.0315 \log_{10}\left(\frac{1}{[M]^{+2}}\right)$

D. $E^{\circ}\left(\frac{M^{2+}}{M}\right)+0.0326 \log_{10}\left(\frac{1}{[M]^{+2}}\right)$

Answer: B

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