CHEMISTRY

BOOKS - MHTCET PREVIOUS YEAR PAPERS AND PRACTICE PAPERS

MOCK TEST 4

Mcqs

1. Calcium carbonate reacts with aqueous HCl to give $CaCl_2$ and CO_2 as shows below:

$$CaCO_3(s) + 2HCl(aq) \rightarrow CaCl_2(aq) + CO_2(q) + H_2O(l)$$

In this reaction, 250 mL of 0.76 M HCl reacts with 1000 g of $CaCO_3$. Calculate the mass of $CaCl_2$ formed in the reaction

A. 11.1 g

B. 10.54 g

C. 5.25 g

D. 2.45 L

Answer: B

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2. Which of the following is more basic than aniline?

A. diphenylamine

B. Triphenylamine

C. p-nitroaniline

D. Benzylamine

Answer: D

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3. Which of the following is formed when RNH_2 reacts with $RCHO$?

A. Hemiacetals

B. acetals

C. Ketals

D. Imines

Answer: D

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4. Identify Y in the reaction,

$$C_6H_5NH_2 \xrightarrow[273K]{NaNO_2/HCl} X \xrightarrow[dil.\ H_2SO_4]{H_2O} Y$$

A. $C_6H_5N_2Cl$

B. C_6H_5OH

C. C_6H_5NHOH

D. C_6H_6

Answer: B

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5. In a closed flask of 5L, 1.0g of H_2 is heated from 300 to 600 K. which of the following statement is incorrect?

A. Pressure of the gas increases

B. The rate of collision increases

C. The number of mole of gas increases

D. The energy of gaseous molecules increases

Answer: C

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6. Proteins are found to have two different types of secondary structures viz α-helix and β-pleated sheet structure. α-helix structure of protein is stabilised by

A. peptide bonds

B. van der Waals' forces

C. hydrogen bonds

D. dipole-dipole interaction

Answer: C

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7. In AgBr crystal, theion size lies in the order $Ag^+ < < Br^-$.

The AgBr crystal exhibit, in which of the following defect?

A. Defect less (perfect) crystal

B. Schottky defect

C. Frenkel defect

D. Both Schottky and Frenkel defect

Answer: D

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8. Apart from tetrahedral geometry, another possible geometry for CH_4 is square planar with the four H atoms at the corners of the square and the C atom at its centre. Explain why CH_4 is not square planar?

A. the absence of d orbital

B. the smaller size of C atom

C. the smaller size of H atom

D. All of the above

Answer: A

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9. Rate constant k of a reactionn is dependent on temperature $k = Ae^{-E_a/RT}$, k has the least value at

A. high T and high E_a

B. high T and small E_a

C. low T and low E_a

D. low T and high E_a

Answer: D

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10. For a particular reaction $\Delta H^\circ = -38.3kJ$ and $\Delta S^\circ = -113JK^{-1}$. this reaction is

A. spotaneous at all temperature

B. non-spotaneous at all temperature

C. spontaneous at a temperature below 338 K

D. spontaneous at a temperature above 339 K

Answer: C

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11. The heat of atomisation of $PH_3(g)$ is 228 kcal perr mol annd that of $P_2H_4(g)$ is 335 kcal per mol. The energy of P-P bond is

A. 102 kcal/mol

B. 31 kcal/mol

C. 26 kcal/mol

D. 204 kcal/mol

Answer: D

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12. Heat capacity at constant temperature and constant pressure for H_2 is

A. 5 cal $mol^{-1}K^{-1}$

B. 7 cal $mol^{-1}K^{-1}$

C. 8 cal $mol^{-1}K^{-1}$

D. ∞

Answer: D

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13. Specific heat of aluminium is 0.214 cal/$g^{\circ}C$. Heat required to raise the temperature of 40.0 g of Al from 20° to $30^{\circ}C$ is

A. 85.6 cal

B. 3.2 cal

C. 171.2 cal

D. 342.4 cal

Answer: A

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14. During osmosis, flow of water through a semipermeable membrane is:

A. from solution having higher concentration only

B. from both sides of sides of semi-permeable membrane with equal flow rates

C. From both sides of semi-permeable membrane with unequal flow rates

D. from solution having lower concentration only

Answer: D

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15. Reduction potential for the following h alf-cell reaction are

$Zn \to Zn \to Zn^{2+} + 2e^-, E^\circ_{Zn^{2+}/Zn} = -0.76V$

$Fe \to Fe^{2+} + 2e^-, E^\circ_{Fe^{2+}/Fe} = -0.44V$

The emf for the cell reaction

$Fe^{2+} Zn \to Zn^{2+} + Fe$

will be

A. $+0.32$

B. $-0.32V$

C. $+1.20V$

D. $-1.20V$

Answer: A

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16. Van't Hoff factors are x,y,z in the case of association, ionisation and no charge respectively. Increasing order is

A. $x < y < z$

B. $x = y = z$

C. $y < x < z$

D. $x < z < y$

Answer: D

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17. Oxidation states of X,Y,Z are +2,+5 and -2 respectively. Formula of the compound formed by these will be

A. X_2YZ_6

B. XY_2Z_6

C. XY_5

D. X_3YZ_4

Answer: B

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18. Which of the following structure is represented by 3-cyclohexyl pentan-3-ol?

A. 

B. 

C. 

D. None of the above

Answer: A

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19. Shape selective catalyst are so called because of :

A. the shape of the catalyst

B. the specificity of the catalyst

C. the size of the pores of catalyst, which can trap selective molecules only

D. their use for only some selected reaction

Answer: C

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20. The mutarotation of glucose is characterised by

A. a change from an aldehyde to ketone structure

B. a change of specific rotation from a positive to a negative value

C. the presence of an intramolecular bridge structure

D. the irreversible change form α-D to the β-D form.

Answer: C

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21. Partition coefficient of an organic compound (A) in 50 mL. 20 betweenn ether and water. 5 g of (A) is 50 mL. water is shaken with 50 mL ether. (A) extracted into ether is

A. 4.0g

B. 4.2g

C. 4.6g

D. 4.8g

Answer: D

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22. What current is to be passed for 0.25 s for deposition of a certain weight of metal, which is equal to its electrochemical equivalent?

A. 4A

B. 100A

C. 200A

D. 2A

Answer: A

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23. What products are obtained by the reaction of sodium with a mixture of 1-iodo-2-methyl propane and 2-iodo propane

A. 2,5-dimethyl hexane

B. 2,3-dimethyl butane

C. 2,4-dimethyl pentane

D. all of the above

Answer: D

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24. Which of the following are not used to convert RCHO into R CH_2OH?

A. H_2 / Pd

B. $LiAlH_4$

C. $NaBH_4$

D. Reaction with RMgX followed by hydrolysis

Answer: D

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25. Compounds with antiseptic properties are

A. $CHCl_3$

B. CHI_3

C. 0.3 ppm aqueous solution of Cl_2

D. none of the above

Answer: B

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26. Ethylene glycol reacts with dimethyl terephthalate to form

A. nylon-6,6

B. teflon

C. dacron

D. orlon

Answer: C

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27. Sodium phenoxide react with CO_2 at 125°C under 5 atm pressure to give salicylic acid. This reaction is called

A. Kolbe's reaction

B. Perkin reaction

C. Wurtz reaction

D. HVZ reaction

Answer: A

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28. Hydrocarbon that is liquid at room temperature is:

A. pentane

B. butane

C. propane

D. ethane

Answer: A

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29. The stability of $+1$ oxidation state increases in the sequence :

A. $Al < Ga < In < Tl$

B. $Tl < In < Ga < Al$

C. $In < Tl < Ga < Al$

D. $Ga < In < Al < Tl$

Answer: A

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30. The solid PCl_5 exists as

A. PCl_3

B. PCl_4^+

C. PCl_6^-

D. PCl_4^+ and PCl_6^-

Answer: D

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31. Which ore contains both iron and copper?

A. Cuprite

B. Chalcocite

C. Chalcopyrite

D. Malachite

Answer: C

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32. Which of the following bonds has the least energy?

A. $Se - Se$

B. Te-Te

C. S-S

D. O-O

Answer: B

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33. Pure nitrogen can be prepared from

A. NH_4OH

B. NH_4NO_2

C. $Ba(NO_3)_2$

D. Ca_3N_2

Answer: B

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34. Sucrose (cane sugar) is a disaccharide. One molecule of sucrose on hydrolysis gives..... .

A. 2 molecules of glucose

B. 2 molecules of glucose+1 molecule of fructose

C. 1 molecule of glucose+1 molecule of fructose

D. 2 molecules of fructose

Answer: C

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35. The complex $\left[Co(NH_3)_5Br\right]SO_4$ will give white precipitate with

A. $BaCl_2$

B. $AgNO_3$

C. Kl

D. none of these

Answer: A

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36. Which of the following is not true?

A. D_2O freezes at lower temperature than H_2O

B. Reaction between H_2 and Cl_2 is must faster than D_2 and Cl_2

C. Ordinary water electrolysed more rapidly than D_2O

D. Bond dissociation energy of D_2 is greater than H_2

Answer: A

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37. Calomel reacts with NH_4OH to give

A. $HgNH_2Cl$

B. $NH_2 - Hg - Hg - Cl$

C. Hg_2O

D. HgO

Answer: A

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38. On heating $K_2Cr_2O_7$ with NaCl and conc. H_2SO_4, the gas liberated is

A. CrO_2Cl_2

B. $CrCl_3$

C. Cr_2O_3

D. $CrOCl_2$

Answer: A

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39. The geometry of $Ni(CO_4)$ and $Ni(PPh_3)_2Cl_2$ are

A. Both square planar

B. Tetrahedral and square planar, respectively

C. Both tetrahedral

D. square planar and tetrahedral, respectively

Answer: C

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40. Which of the following transition metal shows the highest oxidation state:

A. Fe

B. Mn

C. V

D. Cr

Answer: B

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41. In the reaction ,

$$CH_3 - \underset{\underset{Br}{|}}{CH} - CH_3 \xrightarrow{alc.KOH} (A) \xrightarrow[\text{Peroxide}]{HBr} (B) \xrightarrow[\text{Acetone}]{NaI} (C)$$

The compound (C) is :

A. $CH_3CH_2CH_2l$

B. $CH_3 - \underset{\underset{I}{|}}{CH} - CH_3$

C. $CH_3 - \underset{\underset{I}{|}}{CH} - CH_2I$

D. $CH_3 - CH = CHl$

Answer: A

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42. Components of alloy 'Invar' are

A. steel and chromium

B. vanadium and manganese

C. tungsten and chromium

D. steel and nickel

Answer: B

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43. Central atom is sp^3d-hydridised in

A. PCl_5, BrF_3, XeF_2

B. PCl_6^-, PCl_4^+, XeF_2

C. $XeF_2, XeO_3, XeOF_4$

D. PCl_5, PCl_3, XeO_3

Answer: A

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44. Arrange the following compounds in increasing order of their boiling points.

$CH_3CHO, CH_3CH_2OH, CH_3OCH_3, CH_3CH_2CH_3$

A.

$$CH_3CH_2CH_3 < CH_3CH_2OH < CH_3OCH_3 < CH_3CHO$$

B.

$$CH_3OCH_3 < CH_3CH_2CH_3 < CH_3CH_2OH < CH_3CHO$$

C.

$$CH_3CH_2CH_3 < CH_3OCH_3 < CH_3CHO < CH_3CH_2OH$$

D.

$$CH_3CH_2OH < CH_3CHO < CH_3OCH_3 < CH_3CH_2OH$$

Answer: C

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45. Metal carbonates decompose on heating to give metal oxide and carbon dioxide. Which of the metal carbonates is

most stable thermally?

A. $MgCO_3$

B. $CaCO_3$

C. $SrCO_3$

D. $BaCO_3$

Answer: D

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46. Which of the following is halogen exchange reaction?

A. $RX + NaI \rightarrow R - I + NaX$

B. 

C. $R - OH + HX \xrightarrow{ZnCl_2} R - X + H_2O$

D. 

Answer: A

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47. σ-complex formed in the chlorination of benzene is

A. 

B. 

C. 

D. All of these

Answer: D

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48. Which of the following is not the mechanism of Cannizzaro reaction ?

$$2PhCHO \xrightarrow{\overset{\Theta}{OH}} PhCH_2OH + PhCOO^{\Theta}$$

A. the attack of OH^- at the (C=O) group

B. the transfer of H^- ion to the (C=O) group

C. The abstraction of H^+ ion from carboxylic acid

D. the deprotonation of $PhCH_2OH$

Answer: D

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