

CHEMISTRY

BOOKS - MHTCET PREVIOUS YEAR PAPERS AND PRACTICE PAPERS

PRACTICE SET 12

Paper 1 Physics Chemistry

1. 10g of a mixture of BaO and CaO requires 100cm^3 of 2.5mHCl of react competely. The percentage of calcium oxide in the mixture is approximately

(given, molar mass of $BaO = 153$)

A. 52.6

B. 55.1

C. 44.9

D. 47.9

Answer: A



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2. During isothermal expansion of an ideal gas, its:

- A. internal energy increases
- B. enthalpy decreases
- C. enthalpy remains unaffected
- D. enthalpy reduces to zero

Answer: C



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3. The equivalent conductance at infinite dilution of a weak acid such as HF

- A. can be determined by extrapolation of measurement on dilute solutions of HCl, HBr and HI
- B. can be determined by measurement on very dilute HF solutions
- C. can best be determined from measurement on dilute solutions of NaF, NaCl and HCl
- D. is an undefined quantity

Answer: C



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4. It takes 10 min for the decomposition of 50% H_2O_2 . If the reaction is of first order, the rate constant will be

- A. 0.693 per min

B. 0.00693 per sec

C. 0.0693 per min

D. 6.93 per sec

Answer: C

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5. Non stoichiometric metal deficiency as shown in the salts of

A. all metals

B. alkali metals only

C. alkaline earth metals only

D. transition metals only

Answer: D

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6. Excess of PCl_5 reacts with concentrated H_2SO_4 giving :

- A. sulphuryl chloride
- B. sulphurous acid
- C. chlorosulphuric acid
- D. thionylchloride

Answer: D

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7. Which one of the following conversions involve change in both hybridisation and shape?

- A. $CH_4 \rightarrow C_2H_6$
- B. $NH_3 \rightarrow NH_4^+$
- C. $BF_3 \rightarrow BF_4^-$
- D. $H_2O \rightarrow H_3O^+$

Answer: A



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8. Cations with all the paired electrons will have the total magnetic moment of

A. 1.54

B. 2.83

C. zero

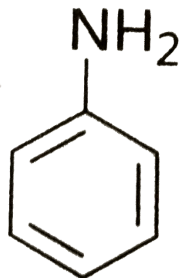
D. 5.92

Answer: C



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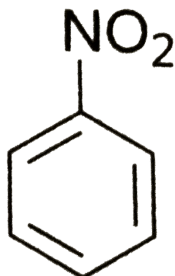
9. Consider the following compounds,



Aniline

I

and



Nitrobenzene

II

Which of the following statements(s) is/are incorrect regarding I and II?

- A. I shows +R-effect whereas II shows -R-effect
- B. I shows -R-effect whereas II shows +R-effect
- C. Both I and II shows -R-effect
- D. Both I and II shows +R-effect

Answer: A

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10. The number of ether metamers represented by the formula $C_4H_{10}O$ is

A. 4

B. 3

C. 2

D. 1

Answer: B



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11. The molal depression constant depends upon

A. nature of solute

B. nature of solvent

C. heat of solution of the solute in the solvent

D. vapour pressure of solution

Answer: B



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12. Which of the following is incorrect?

A. A real gas behaves like an ideal gas over a wide range of pressure

(~100 atm) at boyle point

B. A real gal behaves like an ideal gas over a wide range of pressute

(~100 atm) at critical temperature of the gas

C. $\left(\frac{\delta u}{\delta V}\right)_T = 0$ for an ideal gas

D. $\left(\frac{\delta u}{\delta V}\right)_T = \frac{a}{V^2}$ for a gas obeying van der Waal's equation

Answer: B



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13. 0.1 M solution of an electrolyte A^+B^- placed in a conductivity cell with electrodes 4 cm apart and each with area of cross-section equal to 2 sq cm was found to have a resistance of 200Ω . The molar conductivity of the solution will be

A. $25\text{cm}^2 / \Omega$

B. $100\text{cm}^2 / \Omega$

C. $0.25\text{cm}^2 / \Omega$

D. $400\text{cm}^2 / \Omega$

Answer: B



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14. In alkaline medium, ClO_2 oxidises H_2O_2 to O_2 and is itself reduced to Cl^\ominus . How many moles of H_2O_2 are oxidised by 1mol of ClO_2 ?

A. 1

B. 1.5

C. 2.5

D. 3.5

Answer: C



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15. Three element A , B , C crystallize into a cubic solid lattice. Atoms A occupy the corners B atoms the cube centres and atom C the edge. The formula of the compound is

A. ABC

B. ABC_2

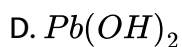
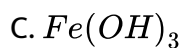
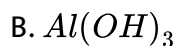
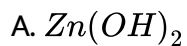
C. ABC_3

D. ABC_4

Answer: C

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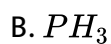
16. Which of the following metal hydroxides does not dissolve in sodium hydroxide solution?

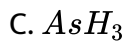


Answer: C

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17. Which of the following has lowest dipole moment?



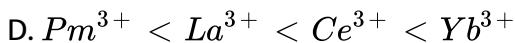
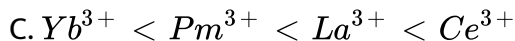
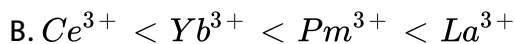
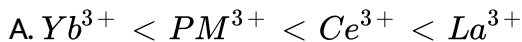


Answer: D

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18. Arrange Ce^{3+} , La^{3+} , Pm^{3+} and Yb^{3+} in increasing order of their size

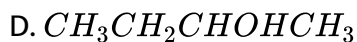
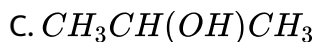
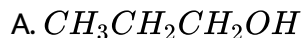
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Answer: A

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19. The compound which is obtained by treating chloropropane with alcoholic KOH , then reacts with BH_3/THF followed by acetic acid gives

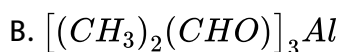


Answer: B



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20. The specific reagent used to reduce



C. $Zn(Hg)$ and conc. HCl

D. $BH_3 / H_2O_2, \Delta$

Answer: D

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21. The solubility of a gas in liquid increases with

A. increase in temperature

B. decrease in pressure

C. decrease in temperature and increase of gas pressure

D. none of the above

Answer: C

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22. The value of $\log_{10} K$ for a reaction $A \rightleftharpoons B$ is:

(Given,

$$\Delta_r H_{298K}^\circ = -54.07 \text{ kJ mol}^{-1}, \Delta_r S_{298K}^\circ = 10 \text{ JK}^{-1} \text{ mol}^{-1} \text{ and } R = 8.314 \text{ JK}^{-1} \text{ mol}^{-1})$$

)

A. 5

B. 10

C. 95

D. 100

Answer: B



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23. Which of the following is a secondary cell?

A. Daniel cel

B. Nickel cadmium storage cel

C. Mercury cell

D. Fuel cell

Answer: B



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24. When ethyl acetate was hydrolyzed in the presence of $0.1M HCl$, the constant was found to be $5.40 \times 10^{-5} s^{-1}$. But when $0.1M H_2SO_4$ was used for hydrolysis, the rate constant found to be $6.20 \times 10^{-5} s^{-1}$. From these we can say that

A. H_2SO_4 is stronger than HCl

B. H_2SO_4 is weaker than HCl

C. H_2SO_4 and HCl both have the same strength

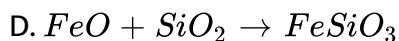
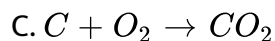
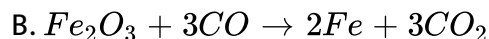
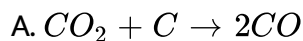
D. the data are not sufficient to compare the strength of H_2SO_4 and

HCl

Answer: A

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25. In the blast furnace the reaction that occurs in the zone of heat absorption is



Answer: A

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26. Which one of the following has the lowest boiling point?

- A. 2-methylbutane
- B. 2-methylpropane
- C. 2,2-dimethylpropane
- D. n-pentane

Answer: B

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27. In XeF_2 , XeF_4 and XeF_6 , the number of the lone pairs of Xe respectively are

- A. 2,3,1
- B. 1,2,3
- C. 4,1,2
- D. 3,2,1

Answer: D

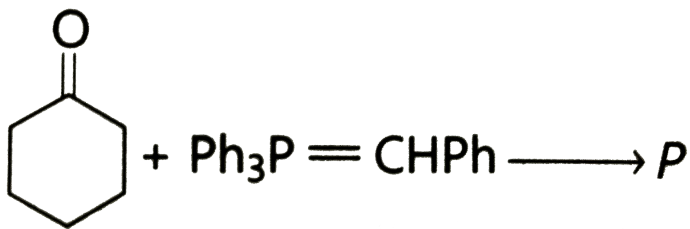
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28. Knowing that the chemistry of lanthanoids (Ln) is dominated by its +3 oxidation state, which of the following statement is incorrect?

- A. Because of the large size of the Ln (III) ions, the bonding in its compounds is predominantly ionic in character
- B. The ionic sizes of Ln(III) decrease in general with increasing atomic number
- C. Ln(III) compounds are generally colourless
- D. Ln(III) hydroxide are mainly basic in character

Answer: C

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29.

Product P is

- A. Z-alkene
- B. E-alkene
- C. an alcohol
- D. an alkyne

Answer: B

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30. Which of the following compounds neither gives iodoform test nor responds to Tollen's test?

- A. Propanone

B. 2-pentanone

C. Ethanal

D. 3-pentanone

Answer: D

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31. Which of the following does not show S_N2 reaction?

A. Vinylic chloride $> C = CH - X$

B. Allyl chloride $CH_2 = CH_2Cl$

C. Chlorobenzene

D. All of the above

Answer: D

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32. In the adsorption of oxalic acid on activated charcoal, the activated charcoal is called

- A. adsorber
- B. adsorbate
- C. adsorbent
- D. occlusion

Answer: C



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33.



Reaction is said

- A. Hofmann bromamide reaction
- B. Schmidt reaction

C. Curtius reaction

D. Beckmann reaction

Answer: A

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34. The boiling point of ethanol is higher than that of dimethyl ether

A. due to inter molecular H-bonding

B. Due to association of molecules

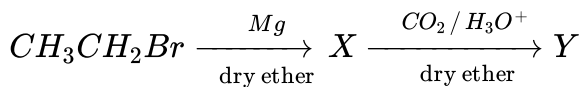
C. due to Lewis base character

D. due to strong dipole-dipole attraction

Answer: A

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35. Consider the following sequence of reactions and identify the final product (Y).



- A. $\text{CH}_3\text{CH}_2\text{CH}_2\text{COOH}$
- B. $(\text{CH}_3)_2\text{CHCOOH}$
- C. $\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2\text{COOH}$
- D. $\text{CH}_3\text{CH}_2\text{COOH}$

Answer: D



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36. Solubility of ethylamine in water is due to

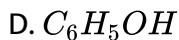
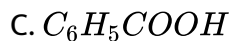
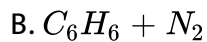
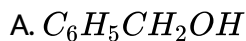
- A. low molecular weight
- B. presence of ethyl group
- C. formation of H-bonding with water

D. being a derivative of ammonia

Answer: C

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37. When aqueous solution of benzene diazonium chloride is boiled, the product formed is



Answer: D

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38. Glucose $\xrightarrow{\text{Zymase}}$ A + carbon dioxide. A when subjected to Victor Meyer's test, gives

- A. blue colouration
- B. purple colouration
- C. red colouration
- D. green colouration

Answer: C

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39. Example of addition copolymer is

- A. buna-S
- B. neoprene
- C. nylon-66
- D. dacron

Answer: A

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40. Neutralisation products of higher monocarboxylic acids with NaOH are

- A. salts
- B. soap
- C. detergents
- D. shampoo

Answer: B

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41. On heating NaX with H_2SO_4 and MnO_2 the halogen that cannot be prepared is

A. I_2

B. F_2

C. Cl_2

D. Br_2

Answer: B



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42. The order of reactivities of methyl halide in the formation of Grignard reagent is

A. $CH_3Cl > CH_3Br > CH_3I$

B. $CH_3I > CH_3Br < CH_3Cl$

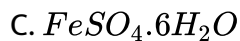
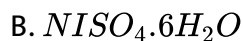
C. $CH_3Br > CH_3I > CH_3Cl$

D. $CH_3Br > CH_3Cl > CH_3I$

Answer: B

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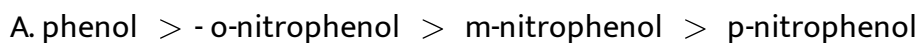
43. Amongst the following, the lowest degree of paramagnetism per mole of the compound at $298K$ will be shown by



Answer: D

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44. The correct order of relative acidic strength of the following compounds is



B. p-nitrophenol > m-nitrophenol > o-nitrophenol > phenol

C. p-nitrophenol > o-nitrophenol > m-nitrophenol > phenol

D. o-nitrophenol > m-nitrophenol > p-nitrophenol > phenol

Answer: C

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45. Most volatile compound is

A. $CH_3COOC_2H_5$

B. CH_3COOH

C. $(CH_3CO)_2O$

D. CH_3CONH_2

Answer: A

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46. $RNH_2 + CHCl_3 + 3KOH(alc.) \rightarrow A + 3KCl + 3H_2O$ form the product A' . RNH_2 can again be obtained by

- A. ammonolysis
- B. reduction
- C. oxidation
- D. hydrolysis

Answer: D



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47. The number of possible isomers of an octahedral complex $[Co(C_2O_4)_2(NH_3)_2]$ is

- A. 1
- B. 2
- C. 3

D. 4

Answer: C



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48. A copolymer of vinyl chloride and acrylonitrile are used in the manufacture of synthetic human hair wigs. It is known as

A. dynel

B. cellulose

C. PVC

D. polyacrylonitrile

Answer: A



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49. Chemical preservatives

- A. reduces pH of food
- B. prevents the growth of organisms
- C. serves as antioxidant
- D. All of the above

Answer: B



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50. The physical states of dispersing phase and dispersion medium in colloid like pesticide spray respectively are

- A. gas, liquid
- B. solid, gas
- C. liquid, solid
- D. liquid, gas

Answer: D



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