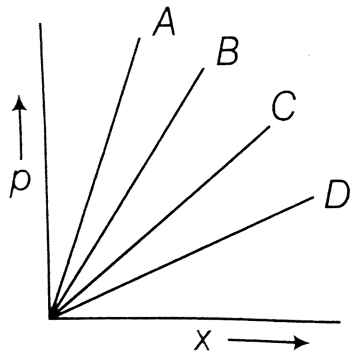
CHEMISTRY

BOOKS - MHTCET PREVIOUS YEAR PAPERS AND PRACTICE PAPERS

PRACTICE SET 19

Paper 1 Physics Chemistry

1. At constant temperature, on the basis of given graph which gas possess higher solubility?



p = Partial pressure
x = Solubility

A. A

B. B

C. C

D. D

Answer: A

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2. According to third law of thermodynamics, the entropy at $0K$ is zero for

A. elements in their stable form

B. perfectly crystalline solid

C. substances at 1 atm and $25^{\circ} C$

D. gaseous substances only

Answer: B

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3. Oxidation state of nitrogen is corectly given for

	Compound	Oxidation state
(a)	Mg_3N_2	-3
(b)	NH_2OH	$+1$
(c)	$(N_2H_5)_2SO_4$	$+2$
(d)	$\left[Co((NH_3)_5Cl\right]Cl_2$	0

A. $1:16$

B. $16:1$

C. $8:1$

D. $1:8$

Answer: A

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4. Milk turns sour at $40^{\circ}C$ three times as faster as at $0^{\circ}C$. The energy of oxygen which can be used to completely convert 2L of SO_2 gas ?

A. 4.694 kcal

B. 2.6 kcal

C. 66.6 kcal

D. 3.2 kcal

Answer: A

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5. How many mL of perhydrol is requried to produce sufficient oxygen which can be used to completely convert 2 L of SO_2 gas of SO_3 gas?

A. 10 mL

B. 5 mL

C. 20 mL

D. 30 mL

Answer: A

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6. Nitric acid oxidise phosphrous to

A. $H_2P_2O_7$

B. H_3PO_3

C. P_2O_5

D. H_3PO_4

Answer: D

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7. The order of electron affinity among halogen is

A. $F \geq Cl > Br > 1$

B. $Cl > F > Cl > Br$

C. $Cl > F > Br > 1$

D. $l > F > Cl > Br$

Answer: C

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8. Which of the following oxides of chromium is amphoteric in nature?

A. CrO

B. Cr_2O_3

C. CrO_3

D. CrO_5

Answer: B

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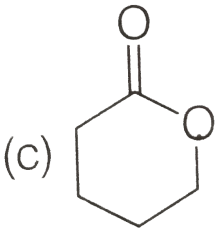
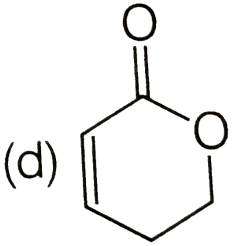
9. Which of the following oxides of chromium is amphoteric in nature?

A. $CH_3 - \underset{\underset{O}{||}}{C} - CH_3$

B. $CH_2 = CH - OH$

C. 

D. 

Answer: D

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10. The correct order of boiling point is

A. $C_2H_5 - O - C_2H_5 > C_4H_9OH > CH_3 \rightarrow O - CH_3$

B. $C_2H_5 - O - C_2H_5 < C_4H_9OH < CH_3 - O - CH_3$

C. $CH_3 - O - CH_3 < C_2H_5 - O - C_2H_5 < C_4H_9OH$

D. $CH_3 - O - CH_3 > C_2H_5 - O - C_2H_5 > C_4H_9OH$

Answer: C

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11. Which physical property in the alkali metal group increases with atomic number ?

A. Melting point

B. Electronegativity

C. Hydration enthalpy

D. Density

Answer: D

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12. The colour of sky is due to

A. transmission of light

B. wavelength of scattered light

C. absorption of light by atmospheric gases

D. All of the above

Answer: D

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13. The standard emf for the cell cell reaction $Zn + Cu^{2+} \rightarrow Zn^{2+} + Cu$ is 1.10 volt at $25^{\circ}C$. The emf for the cell reaction when $0.1MCu^{2+}$ and $0.1MZN^{2+}$ solutions are used at $25^{\circ} = C$ is .

A. $1.10 \ \text{V}$

B. $0.10 \ \text{V}$

C. $-1.10 \ \text{V}$

D. $-0.110 \ \text{V}$

Answer: A

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14. What is the equivalent weight of SnCl_2 in the following reaction ?

$SnCl_2 + Cl \rightarrow SnCl_4 (\text{Mol. Wt. of } SnCl_2 = 190)$

A. 95

B. 45

C. 60

D. 30

Answer: A

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15. What type of crystal defect is indicated in the diagram given below :

Na^+	Cl^-	Na^+	Cl^-	Na^+	Cl^-
Cl^-	$\square$	Cl^-	Na^+	$\square$	Cl^-
Na^+	Cl^-	$\square$	Cl^-	Na^+	Cl^-
Cl^-	Na^+	Cl^-	Na^+	$\square$	N^+

A. Frenkel defect

B. Frenkel and Schottky defects

C. Interstitial defect

D. Schottky defect

Answer: D

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16. Copper is refined by

A. liquation

B. cupellation

C. bassemerisation

D. polling

Answer: D

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17. Dinitrogen pentoxide (N_2O_5), a colourless solid is prepared by

A. heating NH_4NO_2 with an excess of oxygen

B. dehydrating HNO_3 with CaO

C. dehydrating HNO_3 with P_4O_{10}

D. heating a mixture of HNO_2 and $Ca(NO_3)_2$

Answer: C

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18. The shape of $XeOF_2$ on the basis of VSEPR theory is

A. see-saw

B. V-shaped

C. trigonal planar

D. T-shaped

Answer: D

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19. All alkyl halides undergo reduction process except

A. fluorides

B. chlorides

C. iodides

D. bromides

Answer: A

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20. Mark the correct statement about aldehydes and ketones

A. They are soluble in organic solvents like benzene, ether, methanal, chloroform etc

B. Their solubility increases rapidly on increasing the length of the alkyl chain

C. They are used in the blending of perfumes and flavouring agents

D. All of the above

Answer: D

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21. A binary liquid solution is prepared by mixing n-heptane and ethanol. Which one of the following statements is correct regarding the behaviour of the solution?

A. The solution is formed in an ideal solution

B. The solution is non-ideal, showing positive deviation from Raoult's law

C. The solution is non-ideal, showing negative deviation from Raoult's law

D. n-heptane shows positive deviation while ethanol shows negative deviation from Raoult's law

Answer: B

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22. For which of the following reactions ΔH is less than ΔE ?

A. $\mathrm{HCl(aq)} + \mathrm{NaOH(aq)} \rightarrow \mathrm{NaCl(aq)} + \mathrm{H_2O}(l)$

B. $\mathrm{H_2}(g) + l_2(g) \rightarrow 2\mathrm{Hl(g)}$

C. $N_2(g) + O_2(g) \xrightarrow{\text{Electricity}} 2\mathrm{NO(g)}$

D. $N_2(g) + 3\mathrm{H_2}(g) \rightarrow 2\mathrm{NH_3}(g)$

Answer: D

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23. In which cell the free energy of a chemical reaction is directly converted into electricity ?

A. Leclanche cell

B. Concentration cell

C. Fuel cell

D. Lead storage battery

Answer: B

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24. For a zero order reaction, the plot of concentration, vs time is linear with

A. $+$ve slope and zero intercept F75

B. $-$ ve slope and zero intercept

C. $+$ ve slope and non-zero intercept

D. $-$ ve slope and non-zero intercept

Answer: D

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25. What is the ratio of kinetic energies of 3 g of hydrogen and 4 g of oxygen at T (K) ?

A. $12:1$

B. $6:1$

C. $1:6$

D. $24:1$

Answer: A

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26. The molecular geometry of sulphuric acid is

A. pyramidal

B. square planar

C. tetrahedral

D. trigonal bipyramidal

Answer: C

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27. Compounds formed when the noble gases get entrapped in the cavities of crystal lattices of certain oreganic and inorganic compounds are known as

A. interstitial compounds

B. clathrates

C. hydrates

D. picrates

Answer: B

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28. Which of the following elements involves gradual filling of 5f-level ?

A. Lanthanides

B. Actinides

C. Transition metals

D. Coinage metals

Answer: B

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29. Oxygen is gas but sulphur is solid because

A. molecular mass of sulphur is much higher than of oxygen

B. oxygen is a stronger oxidising agent than sulphur

C. boiling point of sulphur is much higher than that of oxygen

D. oxygen is composed of discrete molecules while sulphur is polymeric

Answer: C

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30. Identify the compound A and B in the following reaction sequence.

$$(CH_3)_2C=O \xrightarrow[HCl]{NaCN} A \xrightarrow[heat]{H_3O^+} B$$

A. $A = CH_3COOH, B = (CH_3CO)_2O$

B. $A = (CH_3)_2C(OH)CN, B = (CH_3)_2C(OH)COOH$

C. $A = CH_3CHO, B = CH_3COOH$

D. $A = (CH_3)_2C(OH)CN, B = (CH_3)_2C = O$

Answer: B

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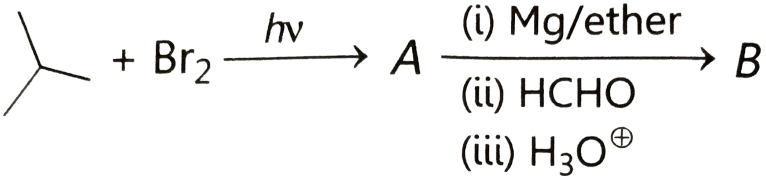
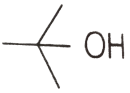
31. Complete the following reaction



A. (a) $HOCH_2$ 

B. (b) CH_3  OH

C. (c) $CH_3—CH_2$  OH

D. None of these

Answer: A

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32. Which of the following is incorrect ?

A. H_2O_2 is a weak acid

B. H_2O_2 is a weak alkali

C. H_2O_2 acts as an oxidising agent

D. H_2O_2 is a reducing agent

Answer: A

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33. A coordination compound of cobalt has the molecular, formula containing five ammonia molecules, one nitro group and two chlorine atoms for onew cobalt atom. One mole of this compounds three ions in an aqueous solution. On reacting this solution with excess of $AgNO_3$ solution, we get two moles of AgCI precipitate. The ionic formula for this complex would be

A. $\left[\mathrm{Co(NH_3)_4NO_2Cl}\right]\left[\mathrm{(NH_3)Cl}\right]$

B. $\left[\mathrm{Co(NH_3)_5(NO_2)}\right]\mathrm{Cl_2}$

C. $\left[\mathrm{Co(NH_3)_5}\right]\left[\mathrm{(NO_2)_2Cl_2}\right]$

D. $\left[\mathrm{Co(NH_3)_5Cl}\right]\left[\mathrm{Cl(NO)_2}\right]$

Answer: B

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34. Which is the most suitable method for removing the traces of water from ethanol ?

A. Heating with Na metal

B. Passing dry HCl gas through it

C. Distilling it

D. Reacting with Mg

Answer: D

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35. Trans esterification involves a reaction between

A. two molecules of an ester

B. acyl halides and alcohols

C. esters and alcohols

D. acid anhydrides and alcohols

Answer: C

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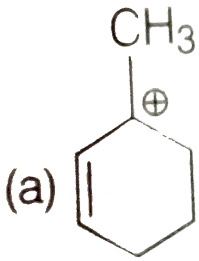
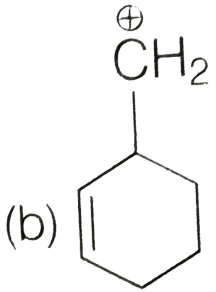
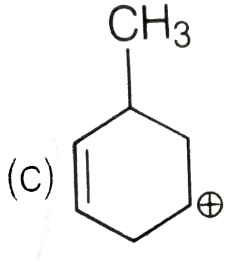
36. Most stable carbocation among the following is

A.



B.



C. 

D. All of these

Answer: A

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37. Identify the product in the following sequence 3,4,5-tribromoaniline $\xrightarrow[(ii)\ H_3PO_2]{(i)\ \text{Diazotisation}}$?

A. 3, 4, 5-tribromobenzene

B. 1, 2, 3-tribromobenzene

C. 2, 4, 6-tribromobenzene

D. 3, 4, 5-tribromonitrobenzene

Answer: B

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38. In polysaccharides, the linkage connecting monosaccharide is called

A. glycoside linkage

B. nucleoside linkage

C. glycogen linkage

D. peptide linkage

Answer: A

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39. When 2-chloro-2-methylbutane is heated with alc. KOH, the possible proudct(s) is/are

I. $(CH_3)_2C = CHCH_3$

II. $CH_2 = C(CH_3)CH_2CH_3$

III. $(CH_3)_2CHCH = CH_2$

A. I, II and III

B. I and III

C. II and III

D. I and II

Answer: D

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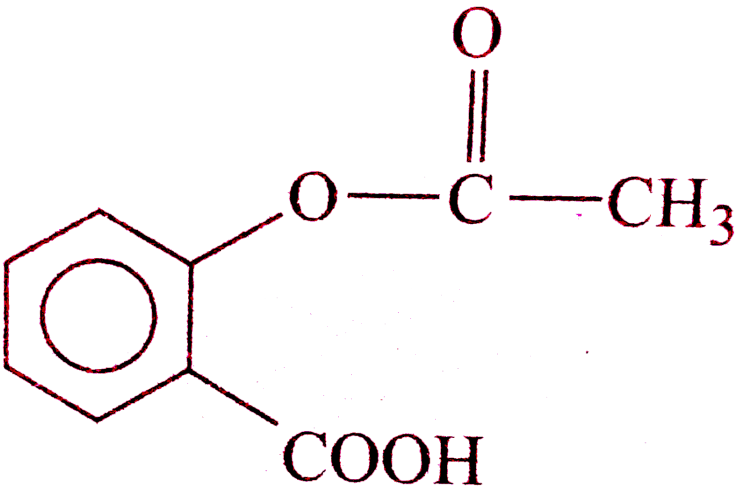
40. The following compound is used as :



A. an anti-inflammatory compound

B. analgesic

C. hypnotic

D. antiseptic

Answer: B

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41. Chlorine acts as bleaching agent only in the presence of .....

A. dry air

B. moisture

C. sunlight

D. pure oxygen

Answer: B

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42. Calculate the volume of water required to dissolve$0.1g$ lead (II) chloride to get a saturaed solution $(K_{sp}$ of $PbCI_2 = 3.2 \times 10^{-8}$, atomic mass of $Pb = 207u)$. Multiply your answer with 10 to get answer.

A. 50mL

B. $100 \ \mathrm{mL}$

C. $180 \ \mathrm{mL}$

D. $18 \ \mathrm{mL}$

Answer: C

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43. Which of the following organometallic compound is σ and π-bonded?

A. $\left[\mathrm{Fe}\left(\eta^5 - \mathrm{C_5H_5}\right)_2\right]$

B. $\left[\mathrm{PtCl_3}\left(\eta^2 - \mathrm{C_2H_4}\right)\right]$

C. $\left[\mathrm{Co(CO)_5NH_3}\right]^{2+}$

D. $\mathrm{Al(CH_3)_3}$

Answer: B

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44. Phenol $\xrightarrow[(ii)\,CO_2/140^\circ C]{(i)\,NaOH} A \xrightarrow{H^+/H_2O} B \xrightarrow{Ac_2O} C$ in this reaction the end product C is

A. salicyl aldehyde

B. salicylic acid

C. phenyl acetate

D. aspirin

Answer: D

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45. In the given reaction,

$(C_6H_5CO)_2O \xrightarrow{H_2O} I$

$C_6H_5COOCOCH_3 \xrightarrow{H_2O} II$

Identify the product(s) formed in the given reaction.

A.

I	II
2 molecules of benzoic acid	2 molecules of ethanoic acid

B.

I	II
2 molecules of benzoic acid	1 molecule of benzoic acid and 1 molecule of ethanoic acid

C.

I	II
1 molecule of ethanoic acid	1 molecule of benzoic acid

D.

I	II
1 molecule of benzoic acid	1 molecule of butanoic acid

Answer: B

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46. Primary amines on heating with CS_2 followed by excess of mercuric chloride yields isothiocyanate. The reaction is called

A. Hofmann mustard oil reaction

B. Perkin reaction

C. Fries reaction

D. Diels-Alder reaction

Answer: A

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47. Defficiency of which vitamin causes degeneration of spinal cord ?

A. E

B. K

C. B_{12}

D. A

Answer: C

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48. Which one of the following is not a condensation polymer?

A. Melamine

B. Glyptal

C. Dacron

D. Neoprene

Answer: D

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49. I. Food preservatives prevent spoilage of food due to microbial growth.

II. C_6H_5COONa, vegetable oils, table salt are commonly used as preservatives.

The true statement(s) is/are (choose the correct option)

A. I is true

B. II is true

C. Either I or II is true

D. Both I and II are true

Answer: D

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50. The number of primary, secondary, tertiary and quaternary carbons in neo-pentane are respectively,

A. 4, 3, 2 and 1

B. 5, 0, 0 and 1

C. 4, 0, 0 and 1

D. 4, 0, 1 and 1

Answer: C

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