

Sadhvi Test No-9  
12th Standard CBSE  
**Chemistry**  
**"All The Best"**

Time : 301:10:0 Hrs

Total Marks : 70

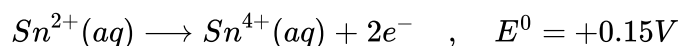
**Section - A**

- 1) Some liquids on mixing form 'azeotropes'. What are 'azeotropes'? 1
- 2) Give the relationship between molar conductivity and specific conductivity. 1
- 3) Fluorine does not exhibit any positive oxidation state. Why? 1
- 4) Write the IUPAC name of 1  

$$CH_3 - \underset{\substack{| \\ Cl}}{CH} - CH_2 - C = CH_2$$
- 5) What are the products of hydrolysis of lactose? 1

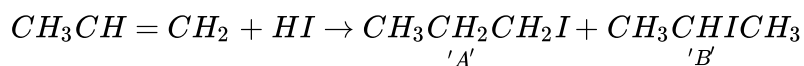
**Section - B**

- 6) Two half cell reactions of an electrochemical cell are given below : 2



Construct the redox reaction from the two half cell reactions and predict if this reaction favours formation of reactants or products shown in the equation.

- 7) Draw the structural formulae of the following compounds: (i)  $H_4P_2O_5$  (ii)  $XeF_4$  2
- 8) How are the following conversions carried out? (i) Propene  $\longrightarrow$  Propan-2-ol (ii) Ethyl magnesium chloride  $\longrightarrow$  Benzyl alcohol (iii) Ethyl magnesium chloride  $\longrightarrow$  Propan-1-ol. (iv) Methyl magnesium bromide  $\longrightarrow$  2-Methylpropan-2-ol. 2
- 9) What are essential and non-essential amino acids ? Give two examples of each type. 2
- 10) Which of the products will be major product in the reaction given below? Explain. 2



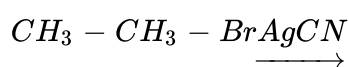
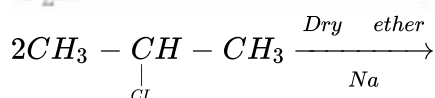
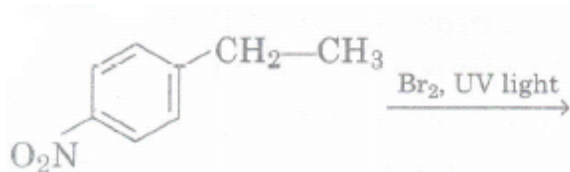
**Section - C**

- 11) The partial pressure of ethane over a saturated solution containing  $6.56 \times 10^{-3}$  g of ethane is 1 bar. If the solution contains  $5.00 \times 10^{-2}$  g of ethane then what shall be the partial pressure of the gas? 3
- 12) The vapour pressure of pure benzene at a certain temperature is 0.850 bar. A non-volatile, non-electrolyte solid weighing 0.5g is added to 39.0g of benzene (molar mass  $78 \text{ g mol}^{-1}$ ). The vapour pressure of the solution then is 0.845 bar. What is the molar mass of the solid substance? 3
- 13) Two electrolytic cells containing silver nitrate solution and copper sulphate solution are connected in series. A steady current of 2-5 ampere was passed through them till 1.078 g of Ag were deposited. How long did the current flow? What weight of copper will be deposited? (at mass of Ag = 107.8, Cu = 63.5) 3

- 14) Iron and Nickel are used to make an electrochemical cell by using a salt bridge to join a half-cell containing 1.0 M solution of  $\text{Fe}^{2+}(\text{aq})$  in which a strip of iron has been immersed to a second half-cell which contains 1.0 M  $\text{Ni}^{2+}(\text{aq})$  solution in which a strip of nickel has been immersed. A voltmeter is connected between the two metal strips. (i) In which cell does reduction occur? (ii) Write the half - cell reactions involved. (iii) Which metal is the anode? (iv) In which direction are the electrons passing through the voltmeter ? (v) What would be effect on the voltmeter reading if  $\text{Fe}^{2+}$  concentration were increased? (vi) What will be the voltmeter reading when the cell reaches equilibrium? Given that the standard electrode potentials of  $\text{Fe}^{2+}/\text{Fe}$  and  $\text{Ni}^{2+}/\text{Ni}$  electrodes are -0.44 and -0.25 volt respectively. 3

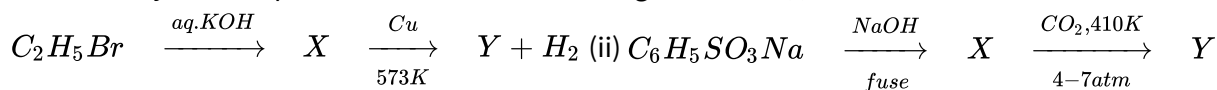
- 15) Following compounds are given to you: 3  
 2-bromopentane, 2-bromo-2-methylbutane, 1-bromopentane  
 (a) Write the compound which is most reactive towards  $\text{S}_{\text{N}}2$  reaction.  
 (b) Write the compound which is optically active.  
 (c) Write the compound which is most reactive towards  $\beta$  elimination reaction.

- 16) Write the major product(s) in the following: 3



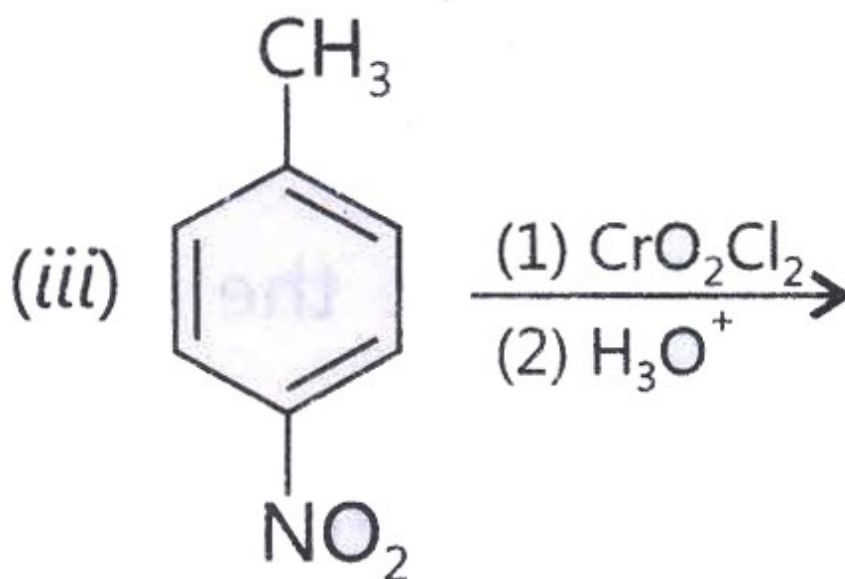
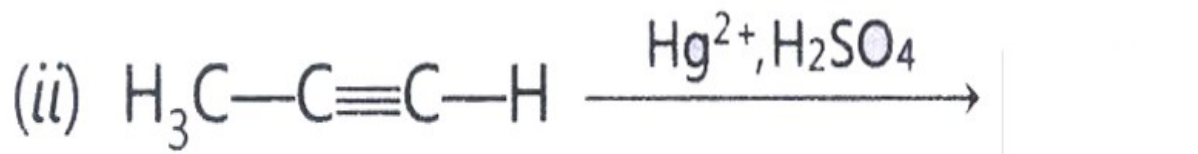
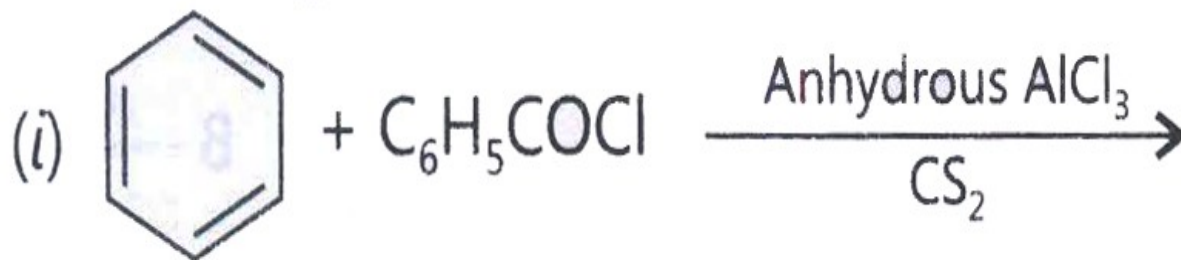
- 17) Account the following: (i) The boiling point of ethanol is higher than that of methanol. (ii) Phenol is a stronger acid than an alcohol. (iii) The boiling points of ethers are lower than isomeric alcohols. 3

- 18) Identify the compound X and Y in the following reactions: (i) 3



19) Write the structures of the main products of following reactions:

3



20) Why are aliphatic carboxylic acids stronger acids than phenols?

3

21) What happens when D-glucose is treated with the following reagents? (i) HI (ii) Bromine water (iii) HNO<sub>3</sub>

3

22) Phosphorus has three allotropic forms - (i) white phosphorus (ii) red phosphorus and (iii) black phosphorus. Write the difference between white and red phosphorus on the basis of their structure and reactivity.

3

#### Section - D

23) Abhay went to hills with family during winter break. After driving for more than six hours he filled the radiator of their car with water. Then his uncle suggested him to add some antifreeze. Abhay was surprised and asked for the reason. After reading the above passage answer the following questions.

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(i) Define antifreeze with example.

(ii) State the reason given by uncle.

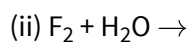
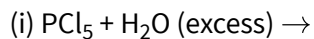
(iii) Name some solvents with lower freezing point than water.

(iv) Mention the values shown by Abhay.

#### Section - E

24) (a) Complete the following reaction equations:

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(b) Explain the following observations:

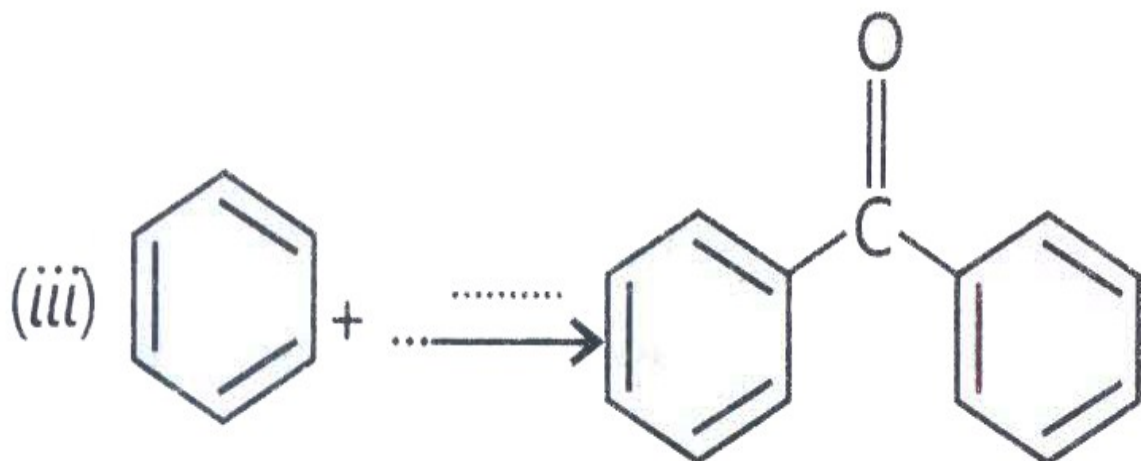
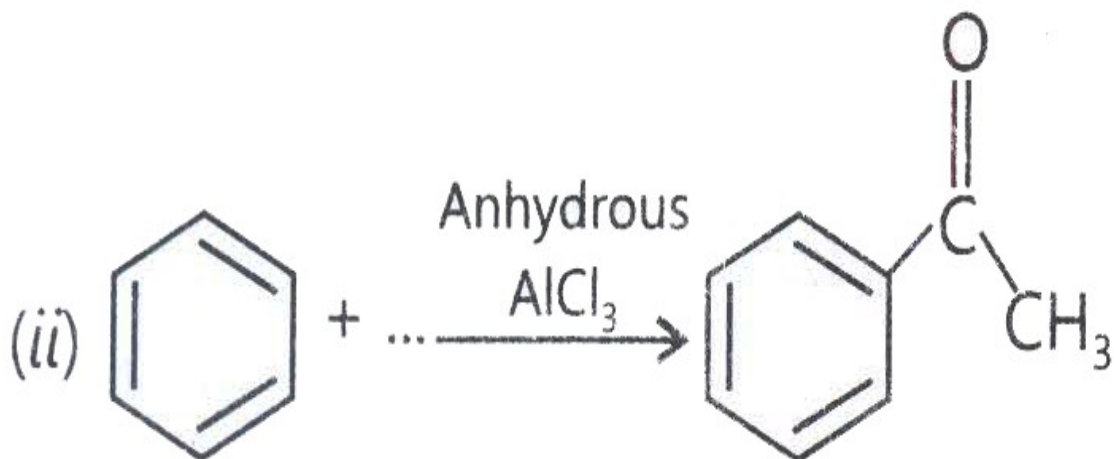
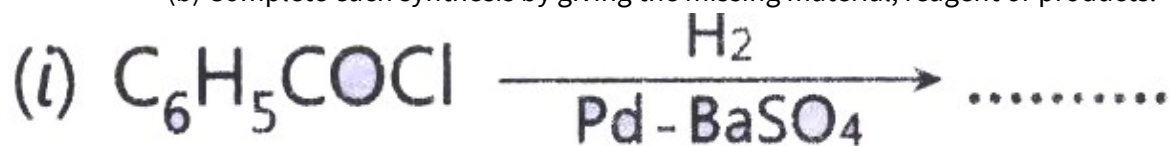
(i) No distinct chemical compound of helium is known.

(ii) Phosphorus has a greater tendency for catenation than nitrogen.

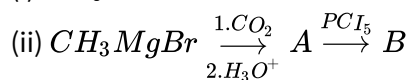
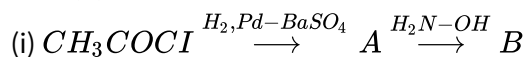
(iii) In solution of  $\text{H}_2\text{SO}_4$  in water, the second dissociation constant  $K_{a_2}$ , is less than the first dissociation constant  $K_{a_1}$ .

25) (a) How are the following obtained? (i) Benzoic acid from ethylbenzene. (ii) Benzaldehyde from toluene. (b) Complete each synthesis by giving the missing material, reagent or products:

5



26) (a) Write the structures of A and B in the following reactions:



(b) Distinguish between:

(i)  $\text{C}_6\text{H}_5\text{-COCH}_3$  and  $\text{C}_6\text{H}_5\text{-CHO}$

(ii)  $\text{CH}_3\text{COOH}$  and  $\text{HCOOH}$ .

(c) Arrange the following in the increasing order of their boiling points :

$\text{CH}_3\text{CHO}$ ,  $\text{CH}_3\text{COOH}$ ,  $\text{CH}_3\text{CH}_2\text{OH}$ .

(OR)

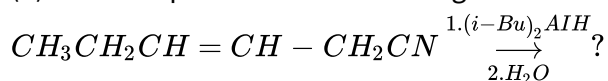
(a) Write the chemical reaction involved in Wolff-Kiphner reduction

(b) Arrange the following in the increasing order of their reactivity towards nucleophilic addition reaction

$\text{C}_6\text{H}_5\text{COCH}_3$ ,  $\text{CH}_3\text{-CHO}$ ,  $\text{CH}_3\text{COCH}_3$

(c) Why carboxylic acid does not give reactions of carbonyl group?

(d) Write the product in the following reaction



(e) A and B are two functional isomers of compound  $\text{C}_3\text{H}_6\text{O}$ . On heating with  $\text{NaOH}$  and  $\text{I}_2$  isomer B forms yellow precipitate of iodoform whereas isomer A does not form any precipitate. Write the formulae of A and B.

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