

# New Style MODEL TEST PAPER-8

CLASS—XII (H.P.)

## CHEMISTRY

Time Allowed : 3 Hours

Maximum Marks : 60

Special Instructions : Same as in Model Test Paper—1.

- The coordination number in hcp structure is :  
(a) 12 (b) 4  
(c) 8 (d) 6.
- Galvanized iron sheets are coated with :  
(a) Copper (b) Nickel  
(c) Zinc (d) Carbon.
- Which of the following does not affect the rate of reaction :  
(a) Temperature  
(b) Concentration of reactants  
(c)  $\Delta H$  of reaction  
(d) Catalyst.
- The chemical reactions in which reactants require high amount of activation energy are generally :  
(a) Slow (b) Fast  
(c) Instantaneous (d) Spontaneous.
- How many coulombs of electricity are required for the Oxidation of 1 mole of  $H_2O$  to  $O_2$  ?  
(a)  $9.65 \times 10^4$  C (b)  $4.825 \times 10^5$  C  
(c)  $1.93 \times 10^5$  C (d)  $1.93 \times 10^4$  C.
- Which of the following solutions has the highest equivalent conductance ?  
(a) 0.01 M NaCl (b) 0.05 M NaCl  
(c) 0.005 M NaCl (d) 0.02 M NaCl.
- Define molecularity of a reaction.
- What are F-Centres ?
- What are  $\sigma$  and  $\pi$  ligands ?
- Define antifreeze.
- Write the reactions and conditions involved in the following conversions ?  
(i) Acetic acid into ethyl alcohol  
(ii) Cumene into phenol.
- (a) Define crystal field splitting energy.  
(b) Write the shape of  $Fe(CO)_5$  molecule.
- Give the mechanism of  $S_N^1$  reaction.
- Explain the reactions occurring in the blast furnace during the extraction of iron from haematite ore.
- Arrange ammonia, ethyl amine and aniline in decreasing order of basic nature and justify.
- Distinguish between soaps and detergents.
- Distinguish between calcination and roasting.
- At elevated temperatures, HI decomposes according to the chemical equation :  
 $2HI(g) \longrightarrow H_2(g) + I_2(g)$   
at 443K. The rate of the reaction increases with concentration of HI, as shown in the

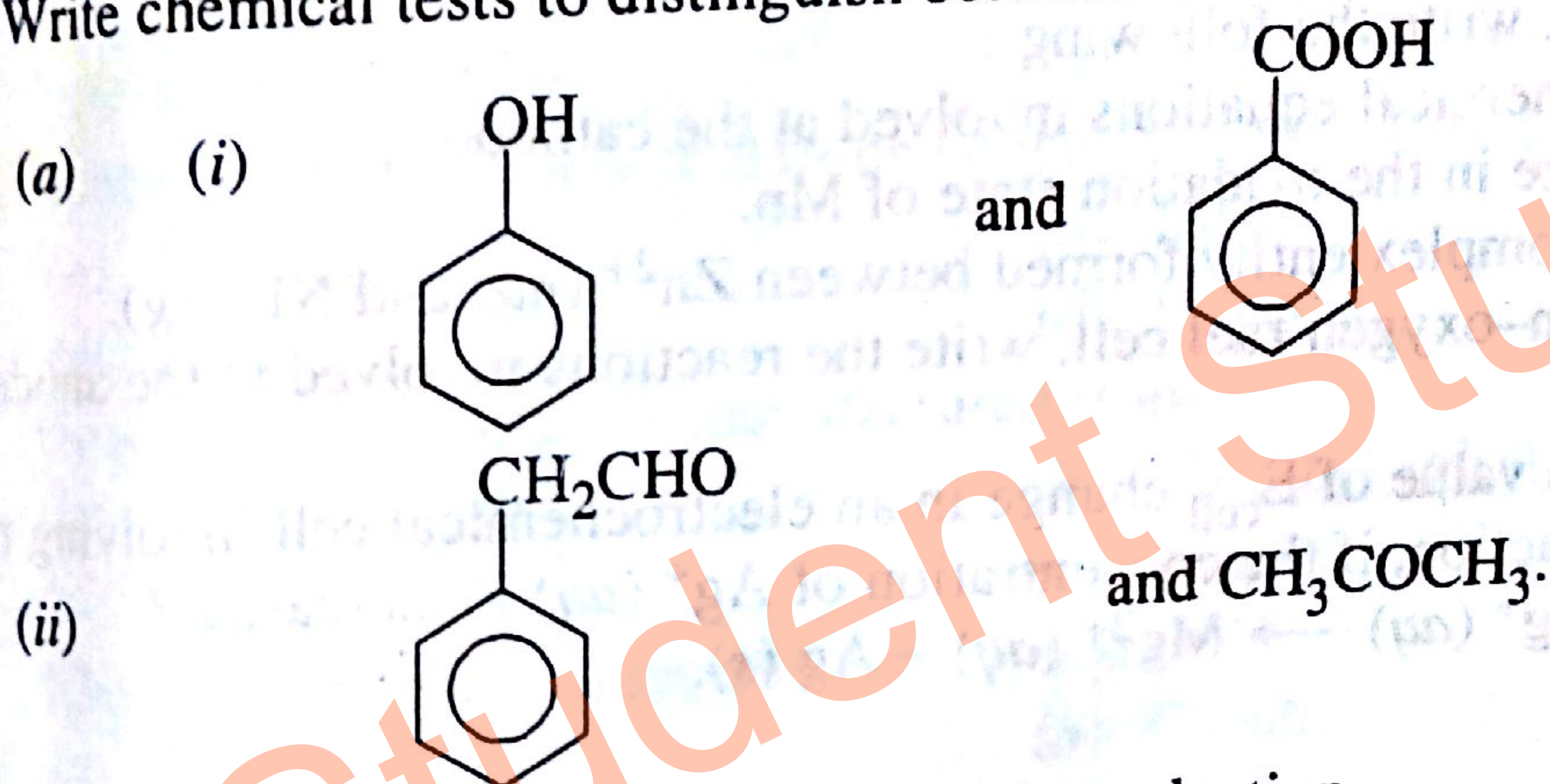


following table :	1	2	3
Experiment No.	0.005	0.01	0.02
HI (mol L <sup>-1</sup> )	$7.5 \times 10^{-4}$	$3.0 \times 10^{-3}$	$1.2 \times 10^{-2}$
Rate (mol L <sup>-1</sup> s <sup>-1</sup> )			

(a) Determine (i) order of this reaction and (ii) write the rate expression.  
 (b) Calculate the rate constant and give its units.

Or

- (a) Distinguish between temperature co-efficient and velocity co-efficient.  
 (b) Explain the effect of temperature on the rate constant of a reaction.
19. Explain the following terms with suitable examples :  
 (i) Ferrimagnetism  
 (ii) *n*-type semiconductor  
 (iii) Forbidden zone.
20. The Henry law constant for oxygen dissolved in water is  $4.34 \times 10^4$  atm at 25°C. If the partial pressure of oxygen in air is 0.2 atm. under ordinary atmospheric conditions, calculate the concentration (in moles per litre) of dissolved oxygen in water in equilibrium with air at 25°C.
21. Write chemical tests to distinguish between the following pair of compounds :



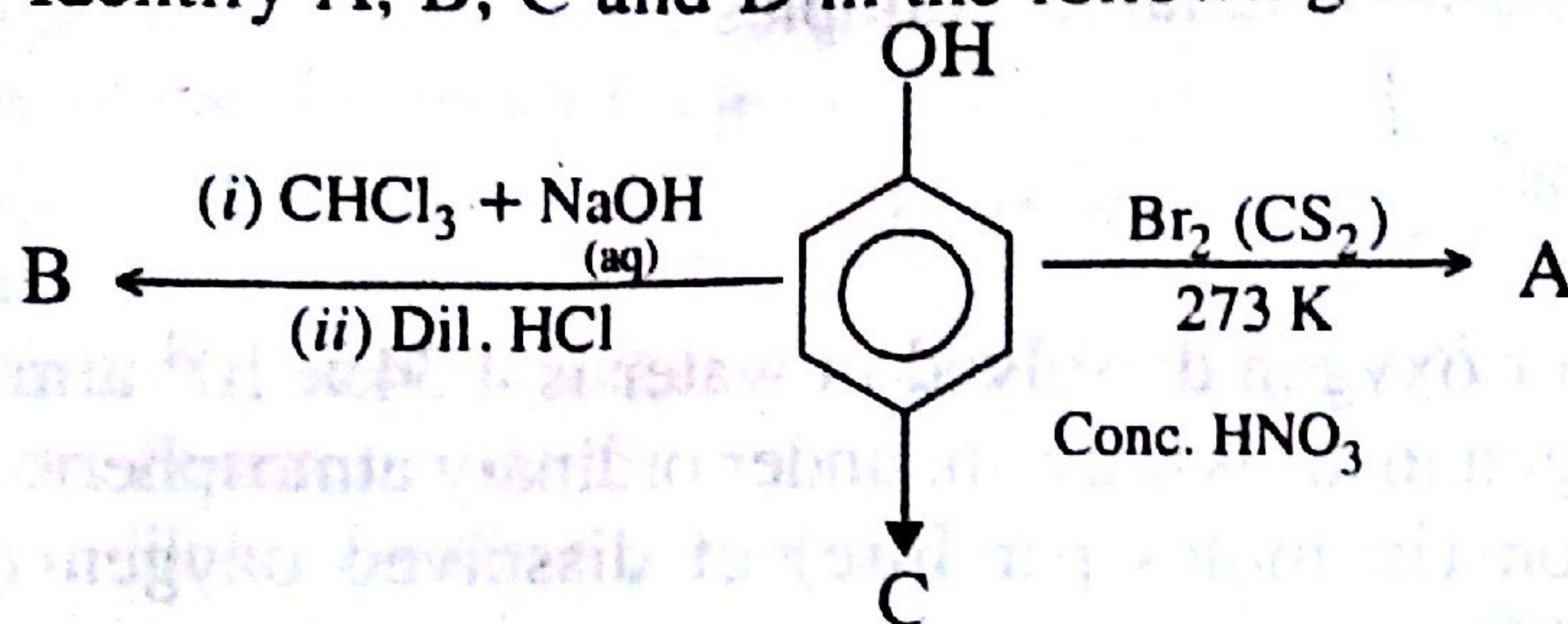
- (b) Give one example of Clemmensen's reduction.
22. (a) Give reasons for the following :  
 (i) The basic strength of aliphatic amines in solution is of the order of  $\text{sec} > \text{tert} > \text{primary}$ .  
 (ii) Aryl halides have higher boiling point than hydrocarbons having almost same molecular masses.
- (b) Give an example of carbylamine reaction.
23. (a) Which bonds in the back bone of peptide can rotate freely and which cannot ? Give reasons.  
 (b) Write one difference between parallel and antiparallel  $\beta$  pleated sheets. Give one example of parallel  $\beta$  pleated sheet.
24. Among the iron complexes,  $\text{K}_3[\text{Fe}(\text{CN})_6]$  is weakly paramagnetic whereas  $\text{K}_3[\text{FeF}_6]$  is highly paramagnetic, explain why ?
25. Describe the following giving one example each :  
 (a) Mechanism of heterogeneous catalysis  
 (b) Hardy Schulze Rule  
 (c) Tyndall effect.



26. (a) How would you purify amines from non-basic impurities ?  
 (b) What product is obtained, when benzene is treated with nitrating mixture ? Give mechanism of reaction.  
 (c) How will you distinguish between  $\text{RNO}_2$  and  $\text{R}-\text{O}-\text{N}=\text{O}$  ?  
 (d) Why boiling point of  $\text{Me}_3\text{N}$  is lower than boiling point of  $\text{C}_3\text{H}_7\text{NH}_2$  ?

Or

- (a) What are the conditions for diazotisation and coupling reaction ? Give equations.  
 (b) Out of amino benzene and  $\text{C}_2\text{H}_5-\text{NH}_2$ , which has lower  $pK_b$  value, and why ?
27. (a) Identify A, B, C and D in the following reaction.



- (b) Give the Zwitter ion structure of sulphanilic acid.
28. (a) In a dry cell, write the following :  
 (i) The chemical equations involved at the cathode.  
 (ii) Change in the oxidation state of Mn.  
 (iii) The complex entity formed between  $\text{Zn}^{2+}(\text{aq})$  and  $\text{NH}_3(\text{g})$ .  
 (b) In a hydrogen-oxygen fuel cell, write the reactions involved at the anode and the cathode.  
 (c) How will the value of  $E_{\text{cell}}$  change in an electrochemical cell involving the following reaction, if the concentration of  $\text{Ag}^+(\text{aq})$  is increased ?  
 $\text{Mg}(\text{s}) + 2\text{Ag}^+(\text{aq}) \longrightarrow \text{Mg}^{2+}(\text{aq}) + 2\text{Ag}(\text{s})$