

# Model Question of HSC Examination 2020

Chemistry Second Paper

Subject Code 

1	7	7
---	---	---

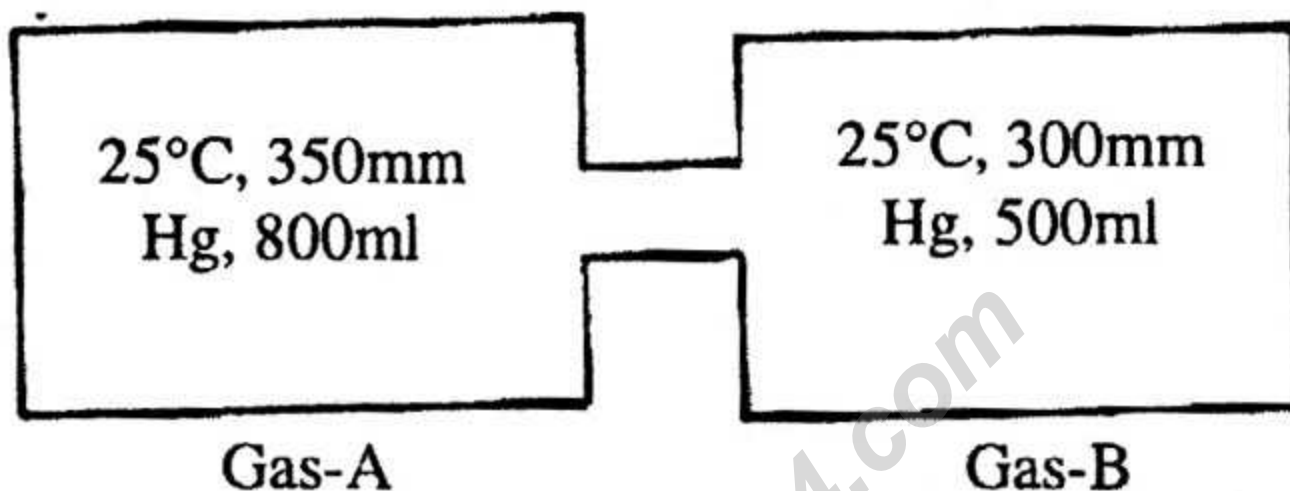
Time — 2 hours 35 minutes

Creative Essay Type

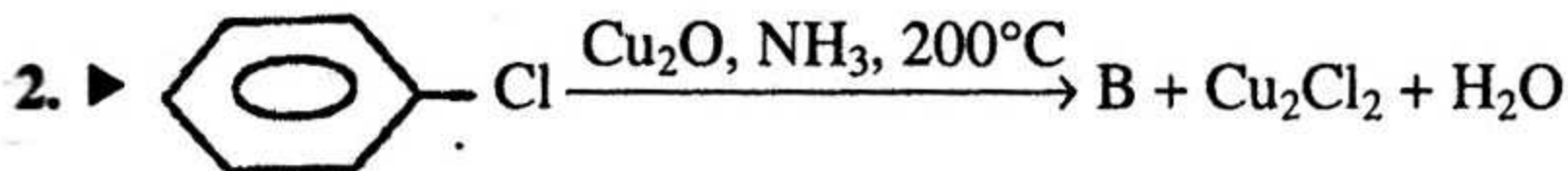
Full marks — 50

[N.B. -The figures in the right margin indicate full marks. Read the stems carefully and answer the associated questions. Answer any five questions.]

1. ►



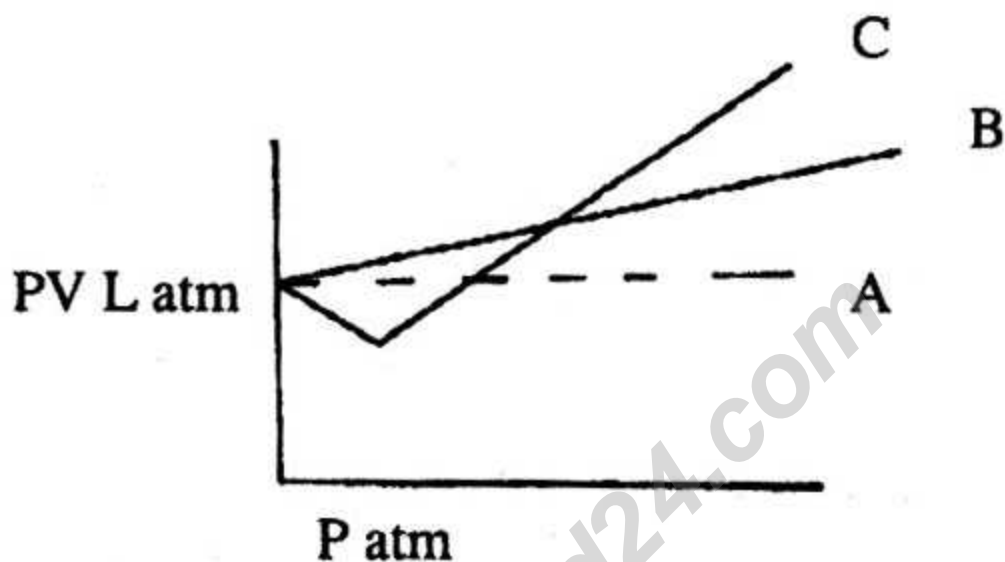
- a. What is Amagat's Curve? 1
- b. Electrochemical equivalent of Cu is 0.000329 g/C— What do you mean by this? 2
- c. What will be the total pressure at 40°C temperature if stopcork is opened? 3
- d. Analyze which law of gases will be appropriate in cyclinderzing the two gases, A and B. 4



- a. What is Peptide bond? 1
- b. Among HCl and NH<sub>3</sub>— which gases had higher rate of diffusion? Explain. 2

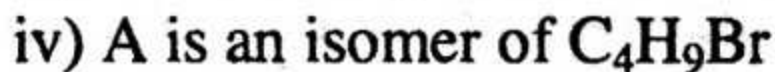
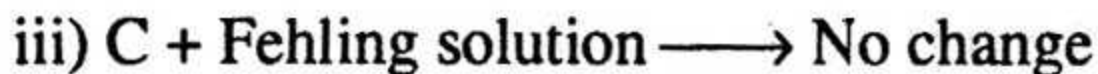
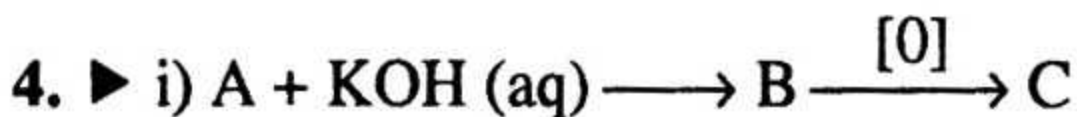
- c. Explain how compound B is identified. 3
- d. Analyze that the substitution in nitration and halogenation reactions of compound B takes place in different positions. 4

3. ★



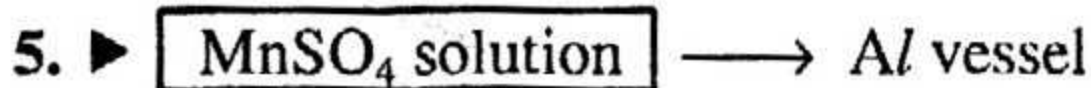
(Here, C gas is produced by the decomposition of potassium chlorate)

- a. What is ETP? 1
- b. 1-alkynes are acidic— explain. 2
- c. Calculate the RMS velocity of C gas at STP. 3
- d. Analyze why the graph of B and C gases are not similar to that of A. 4





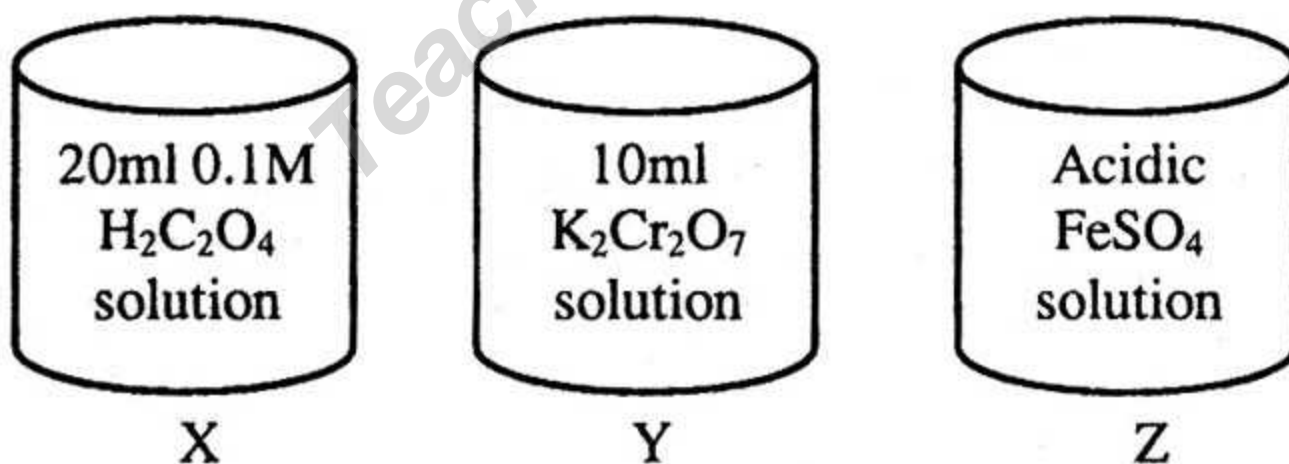
- What is effusion? 1
- Explain that furan is an aromatic compound. 2
- Identify compound C from (ii). 3
- Analyze the structural formula of A completing the above stem's reaction. 4



(Here,  $E^\circ_{\text{Mn}/\text{Mn}^{2+}} = + 1.18\text{V}$  and  $E^\circ_{\text{Al}/\text{Al}^{3+}} = + 1.66\text{V}$ )

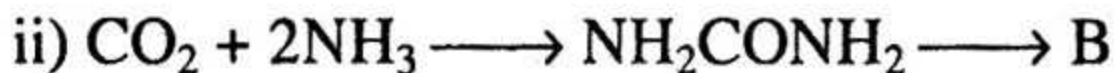
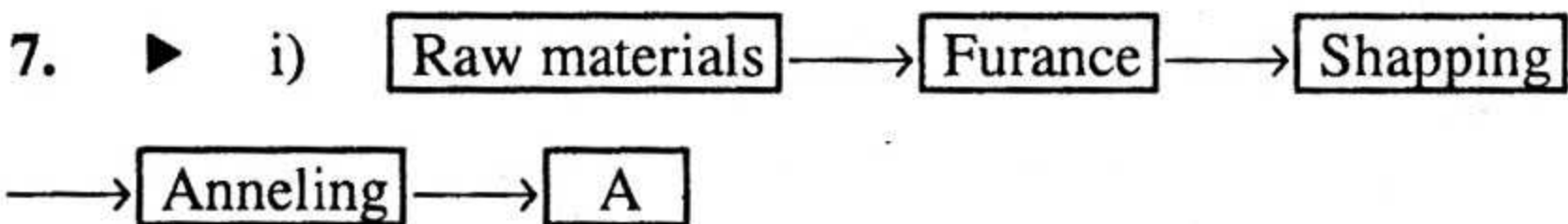
- State Faraday's First law. 1
- Zwitter ion acts both as an acid and base. Explain. 2
- Write down the half reaction happened in Al vessel and also the cell reactions. 3
- Analyze why the above mentioned vessel will be leaked after few days. 4

6. ★



- What is salt bridge? 1
- Why phenol is acidic? 2
- Balance the reaction happened in the mixture of Y and Z solutions of the stem in ion exchange method. 3

- d. Determine the amount of Fe of Z solution with the help of X and Y solutions. 4



- a. What is  $\beta$ -glycosidic linkage? 1
- b. Why gypsum is used in cement industry? 2
- c. Explain the principle of the production of compound A of the stem with reactions. 3
- d. Analyze the effect of pollutants on environment and human body that produced in the production of B in the stem. 4

8. ★ Mr. Zaman is a demonstrator of Chemistry Department and Mr. Asif is a Laboratory Assistant. Mr. Zaman instructed Mr. Asif to keep Nickel salts in copper vessel but he wrongly kept it in zinc vessel. The electrode potentials of Nickel and Zinc are +0.25V and + 0.76V respectively.

- a. What is Racemic Mixture? 1
- b. What is the concentration of 0.15 M HCl solution? 2
- c. How much metal will be deposited at cathode passing 0.1 A current for 60 minutes in the stem's solution of the salt? 3
- d. Analyze by finding its e.m.f. whether the electrolyte will be preserved for long time in Zn vessel or not. 4



Time — 25 minutes

## Creative Multiple Choice Questions

Full marks — 25

[N.B. Choose the best answer among the options. Fill the circle in the answer sheet with ball point pen. Each question has value 1.]

1. **Which one of the following is glass?**

- (a)  $K_2O \cdot Al_2O_3 \cdot 6SiO_2$   
 (b)  $K_2SO_4 \cdot Al_2(SO_4)_3 \cdot 24H_2O$   
 (c)  $CaCO_3 + MgCO_3$   
 (d)  $Na_2O \cdot CaO(a + b)SiO_2$

2. **Which element of cement is responsible for its quick building up?**

- (a)  $CaO \cdot SiO_2$       (b)  $3CaO \cdot Al_2O_3$   
 (c)  $CaO \cdot Fe_2O_3$       (d)  $Al_2O_3$

3. **Which nano particle is used to produce sunscreen lotion?**

- (a)  $Na_2O$       (b)  $ZnO$   
 (c)  $Al_2O_3$       (d)  $CuO$

4. **Fillers used to block the pores in paper—**

- i. talk  
 ii. precipitated  $CaCO_3$   
 iii.  $TiO_2$

**Which one is correct?**

- (a) i & ii      (b) ii & iii  
 (c) i & iii      (d) i, ii & iii

5. **Pressure of a mixture of a 4g of  $O_2$  and 2g of  $H_2$  confined in a bulb of 1 litre at  $0^\circ C$  is—**

- (a) 25.215 atm      (b) 31.205 atm  
 (c) 45.205 atm      (d) 15.21 atm

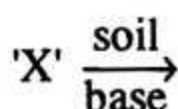
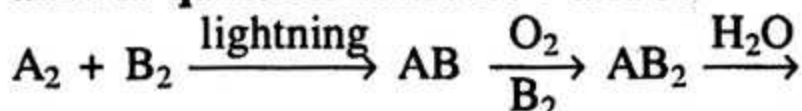
6. **Which one of the following of 1 litre at SATP contains more atoms?**

- (a)  $H_2$       (b)  $NH_3$   
 (c)  $CO_2$       (d)  $CH_4$

7. **What amount of  $CaCO_3$  will remain if  $2 \times 10^{20}$  molecules are removed from 10g  $CaCO_3$ ?**

- (a) 9.550g      (b) 9.669g  
 (c) 9.881g      (d) 9.966g

Observe the following equation and answer question numbers 8 and 9.



soluble nitrate salt; where, A and B are two symbolic elements.

8. **Which is the formula of compound, X?**

- (a)  $HNO_2$       (b)  $HNO_3$   
 (c)  $N_2$   
 (d)  $NH_3$

9. **The salt produced in the reaction—**

- i.  $CaCO_3$   
 ii. Plants take in as food  
 iii. Converted to  $N_2$  due to the effect of denitrifying bacteria

**Which one is correct?**

- (a) i & ii      (b) i & iii  
 (c) ii & iii      (d) i, ii & iii

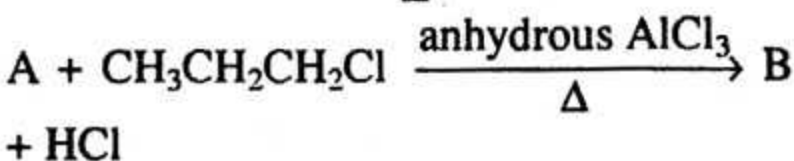
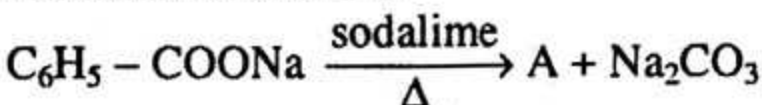
10. **The IUPAC name of  $CH_3CH = CHCOOC_2H_5$  is—**

- (a) Ethylbut-1-enoate  
 (b) Ethylbut-2-enoate  
 (c) Ethylprop-2-enoate  
 (d) 1-Ethylbut-2-enoate

11. **Which one of the following compounds is like to give a white precipitate with  $AgNO_3$  solution?**

- (a)  $CCl_4$       (b)  $CHCl_3$   
 (c)  $CH_2 = CH - Cl$       (d)  $(CH_3)_3C - Cl$

Read the stem and answer question numbers 12 and 13:



12. **The compound A is—**

- (a)  $C_6H_5 - COOH$       (b)  $C_6H_5 - CH_3$   
 (c)  $C_6H_6$       (d)  $C_6H_5 - OH$

13. **Which one is the name of product-B?**

- (a) n-propyl benzene  
 (b) iso propyl benzene  
 (c) ethyl benzene  
 (d) methyl benzene





$\xrightarrow{\text{rearrangement}}$  B; The compound B—

- i. reduces Fehling's solution
  - ii. gives aldol reaction
  - iii. produces acid after being oxidised
- Which one is correct?

- (a) i & ii                      (b) i & iii  
 (c) ii & iii                    (d) i, ii & iii

15. Toluene (boiling)  $\xrightarrow{\text{Cl}_2}$  X + HCl;  
 How many chlorine atoms are there in X?

- (a) 1                              (b) 2  
 (c) 3                              (d) 6

16. Which of the following shows geometric isomerism?

- (a)  $\text{BrCH} = \text{CHCl}$   
 (b)  $\text{CH}_2 = \text{CHCl}$   
 (c)  $\text{CH}_2 = \text{CH}_2$   
 (d)  $\text{Cl}_2\text{C} = \text{CH}_2$

17. Which one is oxidised by  $\text{KMnO}_4$  in acidic solution?

- (a)  $\text{PbO}_2$                       (b)  $\text{H}_2\text{O}_2$   
 (c)  $\text{FeCl}_3$                     (d)  $\text{H}_2\text{S}$

18.  $\text{Br}_2 \rightarrow \text{BrO}_3$ ; in this reaction, the oxidation number of Br changes—

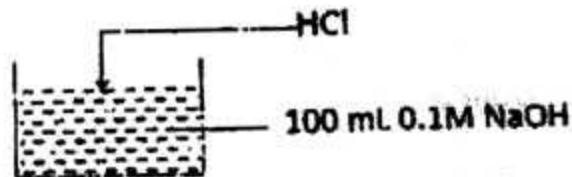
- (a) 0 to +5  
 (b) 0 to -3  
 (c) +1 to +5  
 (d) -1 to +5

19. An amount of  $\text{CO}_2$  will be obtained by the reaction of 1g pure  $\text{CaCO}_3$  with excess dilute HCl. How many grams of NaOH will be required to convert the  $\text{CO}_2$  completely to  $\text{Na}_2\text{CO}_3$ ?

- (a) 0.8g                        (b) 4.0g  
 (c) 40g                         (d) 80g

Observe the following stem and give answers to question numbers 20 and 21:

21:



20. How many grams of HCl will be required to complete neutralization of alkaline solution?

- (a) 36.5 g  
 (b) 3.65g  
 (c) 0.365g  
 (d) 0.0365g

21. How many molecules of NaOH are there in the base of the stem?

- (a)  $6.023 \times 10^{23}$   
 (b)  $6.023 \times 10^{22}$   
 (c)  $6.023 \times 10^{21}$   
 (d)  $6.023 \times 10^{20}$

22. Which component of electrode can easily give up electrons?

- (a) Zn                            (b) Hg  
 (c) Fe                            (d) Mn

23. Which is the representation of lead storage cell?

- (a)  $\text{Pb}/\text{Pb}^{2+} \parallel \text{Cu}^{2+}/\text{Cu}$   
 (b)  $\text{Pb}/\text{PbSO}_4 \parallel \text{H}_2\text{SO}_4(\text{aq})/\text{PbO}_2/\text{Pb}$   
 (c)  $\text{Zn}/\text{Zn}^{2+} \parallel \text{Pb}^{2+}/\text{Pb}$   
 (d)  $\text{Pb}/\text{Pb}^{2+} \parallel \text{H}^+/\text{H}_2$

24. Secondary reference electrode is—

- i. Pt,  $\text{H}_2(1 \text{ atm})/\text{H}^+(1 \text{ m})$
- ii. Ag(s), AgCl(s)/HCl(aq)
- iii. Hg(1),  $\text{Hg}_2\text{Cl}_2(\text{s})/\text{KCl}(\text{aq})$

Which one is correct?

- (a) i & ii                        (b) ii & iii  
 (c) i & iii                      (d) i, ii & iii

25. Which one is not produced by the electrolysis of aqueous NaCl solution?

- (a) NaOH                      (b)  $\text{Cl}_2$   
 (c)  $\text{H}_2$   
 (d) Na

Ans.	1	(d)	2	(b)	3	(b)	4	(d)	5	(a)	6	(d)	7	(d)	8	(b)	9	(c)	10	(b)	11	(a)	12	(c)	13	(a)
	14	(d)	15	(c)	16	(a)	17	*	18	(a)	19	(a)	20	(c)	21	(c)	22	(d)	23	(b)	24	(b)	25	(d)		

17. N.B. The correct answer is both b & d.