

Model Question of HSC Examination 2020

Chemistry Second Paper

Subject Code

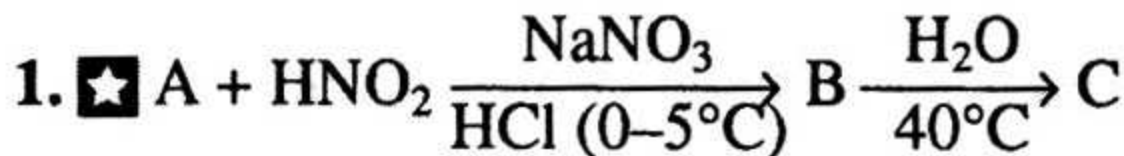
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Time — 2 hours 35 minutes

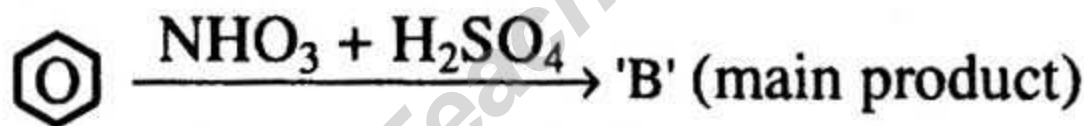
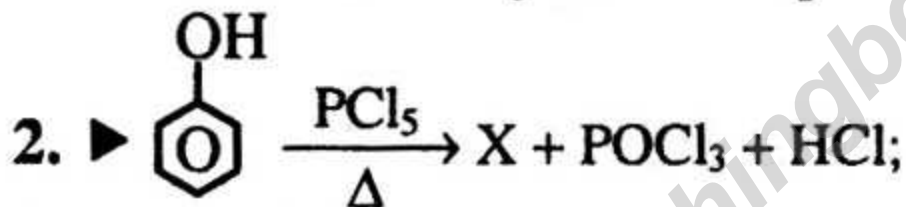
Creative Essay Type

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.]

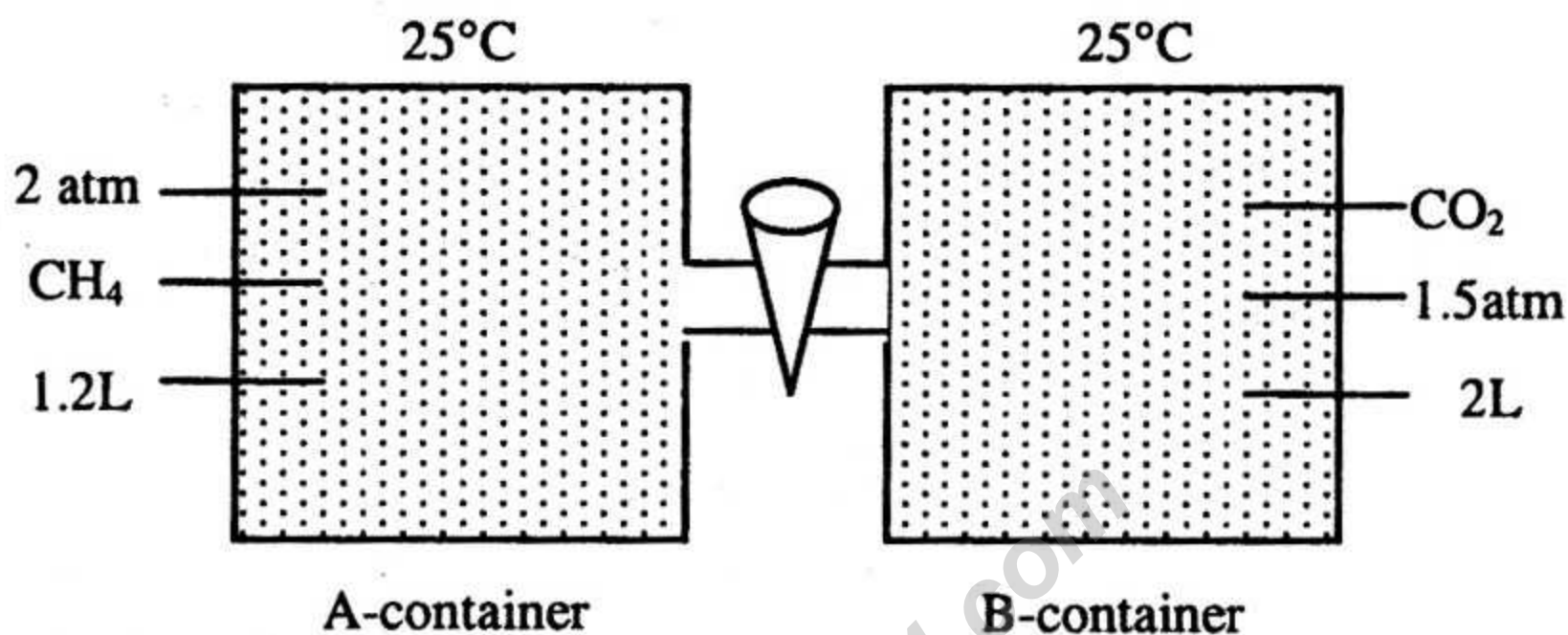


- a. What is zwitter ion? 1
- b. Why is salt added in leather tanning? 2
- c. Explain with equations for the identification of C. 3
- d. Between A and C, which one forms meta-product through nitration? Analyze with equations. 4

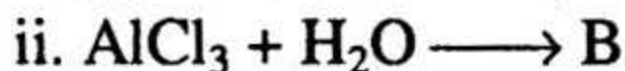


- a. What is producer gas? 1
- b. How would you obtain picric acid from phenol? Explain with equation. 2
- c. Explain the reaction mechanism for the production of 'B'. 3
- d. "The compound, X undergoes nucleophilic and electrophilic substitution reaction under different conditions"— Analyze the statement. 4

3. ★ Observe the following stem and answer the questions given below:



- What is CFC? 1
- Why is RMS velocity more suitable to determine the kinetic energy of gas than average velocity? 2
- Calculate the total pressure of the mixture. 3
- Analyze the diffusion rates of both gases. 4



- Write the Vander Waal's equation of real gas. 1
- What is meant by critical temperature of CO₂ is 31.1°C? 2
- Calculate total number of nitrogen atom in the compound of 'A'. 3
- Which theory of the acid-base is being followed in the compounds, A and B? Analyse with appropriate reasons. 4

5. ▶

'A' is a nitrogen containing compound which is used as a fertilizer in agriculture.

Fig (i)

'B' is an element which is used as electric wire.

Fig (ii)

- What is the formula borax? 1
- Write the difference between atoms and nanoparticles. 2
- Explain the recycling process of 'B' element. 3
- Analyze the principle of production of compound A with appropriate reaction conditions. 4

6. ▶

35 mL, 0.1M
 $\text{H}_2\text{C}_2\text{O}_4$
solution

A solution

25mL
 KMnO_4

B solution

22 mL, acidic
 FeSO_4 ,
solution

C solution

- What is a semi molar solution? 1
- Fe^{2+} ion can act as an oxidizing agent or a reducing agent under certain conditions. Explain. 2
- Balance by ion-electron method of the reaction when B and C solution are mixed. 3
- Using the solution A and B, calculate the amount of iron in C solution. 4

7. ▶

50% pure 2 gm
 CaCO_3

Fig (i)

25 mL H_2SO_4
Solution

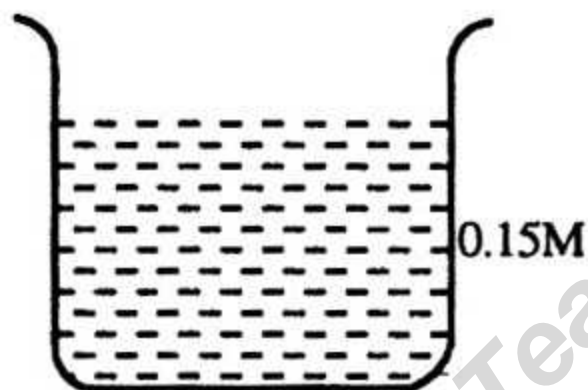
Fig (ii)

30 mL of 0.5 M
NaOH solution

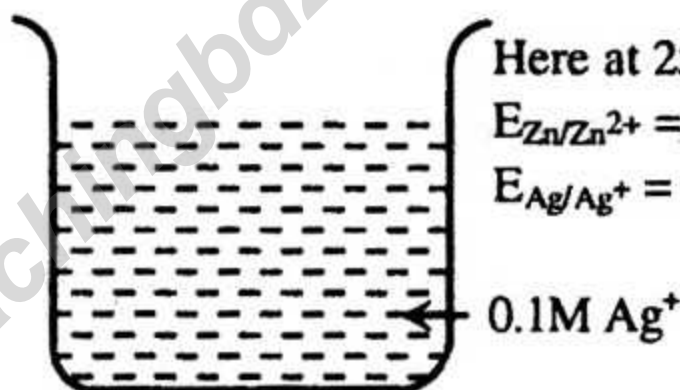
Fig (iii)

- State Beer-Lambert's law. 1
- Why is phenolphthalein used as an indicator in weak acid-strong base titration? 2
- How would you convert Fig(iii) solution to a decimolar solution? 3
- What is the concentration of solution of Fig(ii) when complete neutralization is occurred of the solution of Fig(ii) by the Fig(i) & Fig(iii) 4

8. ▶



Container-1
(1L solution)



Container-2
(1L solution)

Here at 25°C temperature

$$E_{\text{Zn}/\text{Zn}^{2+}} = 0.76\text{V}$$

$$E_{\text{Ag}/\text{Ag}^+} = -0.80\text{V}$$

0.1M Ag^+

- What is weak electrolyte? 1
- Explain the charging & discharging of lithium ion battery. 2
- What coulomb charge will be required to deposit the metal ion of container-1 completely at the electrode? Explain. 3
- Analyze the possibility of spontaneous of electricity if the containers given in the stem are connected through a salt bridge. 4

[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. How much amount of Na_2CO_3 is required to prepare 1000 ml 0.1M solution?

- (a) 10.3g (b) 10.03g
(c) 10.6g (d) 21.2g

Read the stem and answer the questions 2 and 3

Rahman burnt some amount of limestone and obtained 17g residue.

2. What is the amount of limestone burnt?

- (a) 32.14g (b) 44.56g
(c) 30.36g (d) 30.26g

3. Properties of substance present in residue are—

- i. Aqueous solution of the substance is alkaline
ii. When it react with HCl produces salt and water
iii. When excess CO_2 is passed through its aqueous solution produces clear solution.

Which one is correct?

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

4. What is the oxidation number of Cr in $\text{Cr}_2\text{O}_7^{2-}$?

- (a) + 12 (b) + 6
(c) - 6 (d) - 12

5. $\text{CuSO}_4 + \text{KI} \rightarrow \text{Cu}_2\text{I}_2 + \text{I}_2 + \text{K}_2\text{SO}_4$. For this reaction—

- i. Cu^{2+} is oxidized
ii. I^- is oxidized
iii. I^- is reducing agent

Which one is correct?

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

6. In which chromatography He is used as mobile phase?

- (a) TLC
(b) HPLC
(c) GLPC
(d) CC

7. Which is the Vander Wall's equation for 32g O_2 ?

- (a) $(P + n^2a/V^2)(V-b) = RT$
(b) $(P + a/V^2)(V-b) = RT$
(c) $(P + n^2a/V^2)(V-n) = nRT$
(d) $(P + n^2a/V)(V-nb) = nRT$

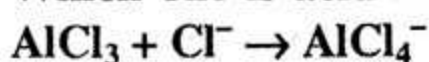
8. On which condition real gas acts as ideal gas?

- (a) At low temperature and pressure
(b) At low temperature and high pressure
(c) At high temperature
(d) At high temperature and low pressure

9. What is absolute zero temperature?

- (a) -273°C
(b) 0°C
(c) 273°C
(d) 100°C

10. Which one is acid in the reaction?



- (a) Cl^- (b) AlCl_3
(c) AlCl_4^- (d) none

11. For $\text{S}_{\text{N}}2$ reaction mechanism, reactivity of alkylhalide is—

- (a) $3^\circ > 2^\circ > 1^\circ$
(b) $1^\circ > 2^\circ > 3^\circ$
(c) $3^\circ > 1^\circ > 2^\circ$
(d) All

12. Lucas reagent is—

- (a) HCl/NaNO_2
(b) H_2/Pd
(c) HCl/ZnCl_2
(d) $\text{H}_2/\text{Pd}/\text{BiSO}_4$

13. What is the stability order of carbonium ion?

- (a) $^+\text{CR}_3 > ^+\text{CHR}_2 > ^+\text{CH}_2\text{R} > ^+\text{CH}_3$
(b) $^+\text{CH}_3 > ^+\text{CH}_2\text{R} > ^+\text{CHR}_2 > ^+\text{CR}_3$
(c) $^+\text{CH}_2\text{R} > ^+\text{CH}_3 > ^+\text{CR}_3 > ^+\text{CHR}_2$
(d) $^+\text{CH}_3 > ^+\text{CH}_2\text{R} > ^+\text{CHR}_2 > ^+\text{CR}_3$

14. Which one is meta directing?
 (a) $-\text{CN}$
 (b) $-\text{NHCOCH}_3$
 (c) $-\text{NHR}$
 (d) $-\text{OCH}_3$

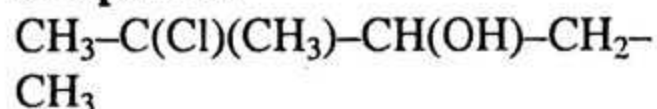
15. ★ Which one is more reactive towards nucleophilic addition reaction?

- (a) methanal
 (b) ethanal
 (c) propanone
 (d) propanal

16. Which one will give iodoform test?

- (a) CH_3OH
 (b) $\text{CH}_3\text{CH}_2\text{OH}$
 (c) HCHO
 (d) $\text{CH}_3\text{CH}_2\text{COCH}_2\text{CH}_3$

17. What is the name of the compound?



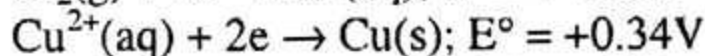
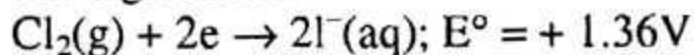
- (a) 2-Chloro, 2-methyl pentanol-4
 (b) 2-Chloro, 2-methyl pentanol-3
 (c) 4-Chloro, 4-methyl pentanol-3
 (d) 2-Chloro, 2-methyl pentanol-2

18. By the ozonolysis of $\text{CH}_3-\text{CH}=\text{CH}_2$ and then hydrolysis in presence of Zn. What will be obtained?

- (a) Two molecules of HCHO
 (b) CH_3COCH_3
 (c) Two molecules of CH_3CHO
 (d) $\text{HCHO} + \text{CH}_3-\text{CHO}$

Follow the stem and answer the question no. 19 and 20.

For a given cell



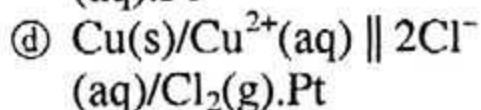
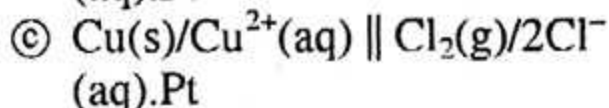
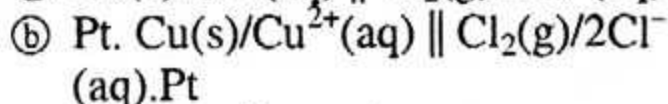
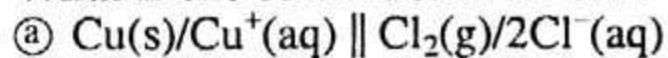
19. What is the e.m.f of the cell?

- (a) $+1.7\text{V}$
 (b) $+1.02\text{V}$

(c) -1.02V

(d) -1.7V

20. What is the construction of cell?



21. ★ Which is used for making deep blue glass?

(a) CoO_2

(b) MnO

(c) CdS

(d) AgCl

22. ★ Components of cooking liquor are—

i. NaOH

ii. Na_2S

iii. Na_2CO_3

Which one is correct?

(a) i & ii

(b) ii & iii

(c) i & iii

(d) i, ii & iii

23. What is the size of nano-particle in general?

(a) 1–100nm

(b) 100–200nm

(c) 150–250nm

(d) 100–2500nm

24. ETP stands for—

(a) Effluent transfer Plan

(b) Effluent Treatment Plant

(c) Effusion Transfer Plant

(d) Electron Treatment Pack

25. Infrared (IR) Spectroscopy is known as—

(a) Vibrational spectroscopy

(b) Rotational spectroscopy

(c) Gamma spectroscopy

(d) Alpha spectroscopy

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