

# Model Question of HSC Examination 2019

Chemistry Second Paper

Subject Code 

1	7	7
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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.]

1. ► (i) HCHO (ii) CH<sub>3</sub>CHO (iii) CH<sub>3</sub>COCH<sub>3</sub>

- a. What is haloform reaction? 1
- b. Why aldehyde is more reactive than ketone? 2
- c. How can you identify mention compound (ii) & (iii)? 3
- d. Which of mention compound show cannizzaro's reaction explain with logic? 4

2. ★

1 <sup>o</sup> , 2 <sup>o</sup> , 3 <sup>o</sup> alcohol	Phenol
Fig-A	Fig-B

- a. What is picric acid? 1
- b. Why phenol is more acidic than 1<sup>o</sup>, 2<sup>o</sup>, 3<sup>o</sup> alcohol? 2
- c. How can you identify stem fig-A using suitable reagent? 3
- d. Is it possible to prepare of salicylic acid & salicyl aldehyde from mention fig-B. Explain with logic. 4

3. ★

<u>Raw Materials :</u> (i) Calcareous (ii) Argillaceous	→	Product : B
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<u>Raw Materials :</u> (i) Soda or soda ash (NaOH, Na <sub>2</sub> CO <sub>3</sub> ) (ii) Lime or Lime stone (CaCO <sub>3</sub> ) (ii) Silica (SiO <sub>2</sub> )	→	Product : D
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- What is china clay? 1
- Why gypsum is used in cement industry? 2
- Write down the chemical reaction that is occurred in rotary klin mention product B. 3
- Explain the manufactures process with flow chart in stem mention product D. 4

4. ►

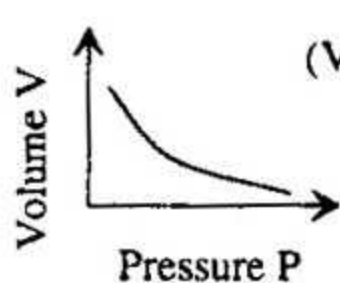


Fig-A

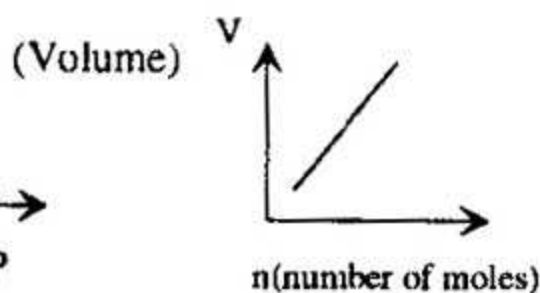


Fig-B

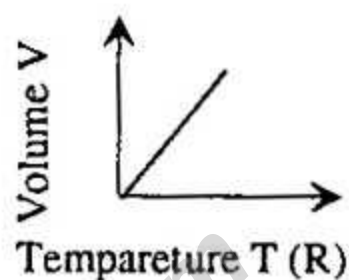


Fig-C

- What is absolute zero temperature? 1
- Calculate the value of R in L-atm unit. 2
- State the gas law of stem mention figures— A, B & C. 3
- Is it possible to determine ideal gas equation from mention figures? Explain with logic? 4

5. ►

### Ideal Gas Equation

P becomes  
V becomes

Fig-A

### Van der Waal's Equation

$P + n^2 a/V$   
 $V - nb$

Fig-B

- What is SATP? 1
- State Graham's law of diffusion? 2
- What is the causes of deviation of fig-B from fig-A equation. 3
- At  $53^\circ\text{C}$  volume of one mole of real gas is  $5.7 \times 10^{-2}$  L. If the vander waal's constants,  $a = 3.592 \text{ atm L}^{-2} \text{ mol}^{-2}$  and  $b = 4.267 \times 10^{-2} \text{ Lmol}^{-1}$ , what is pressure of the gas? 4



6. ★



Fig-(i)



Fig-(ii)

A piece of iron wire was dissolved in dilute  $H_2SO_4$

- What is molarity? 1
- What is the concentration of 10%  $Na_2CO_3$  solution? 2
- Balance the reaction between fig-(i) & (ii) in presence of dilute  $H_2SO_4$ . 3
- Determine the mass of iron wire if it is completely oxidized with fig-(i) 4

7. ►

Titration	Indicator
Strong acid & Strong base	Any suitable indicator
weak acid & weak base	No suitable indicator

- What is standard solution? 1
- What is the molarity of 400 ppm  $NaOH$  solution? 2
- Why the pH value at the end point of acid-base titration is not always equivalent of 7.0? Explain it. 3
- Explain the mechanism of titration curve in selection of suitable indicator stem and justify your answer? 4

8. ► Following the cell reaction :



Concentration of  $Zn^{2+}$  &  $Cu^{2+}$  are  $0.1 \text{ mol/dm}^3$  &  $0.05 \text{ mol/dm}^3$  at  $25^\circ C$

$$E^\circ_{Zn/Zn^{2+}} = 0.76V; E^\circ_{Cu/Cu^{2+}} = -0.34V;$$

- What is standard electrode potential? 1
- State Faraday 1<sup>st</sup> law of electrolysis. 2
- Compare the mention cell with hydrogen fuel cell. 3
- Does the cell reaction take place spontaneously? Explain with your logic. 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. Which of the following chemical is for the curing of skin?

- (a)  $\text{Ca}(\text{OH})_2$       (b)  $\text{CaCl}_2$   
(c)  $\text{NaOH}$             (d)  $\text{NaCl}$

2. Heterocyclic compound remains the following element.

- i. Carbon            ii. Sulphur  
iii. Oxygen

Which one is correct?

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

3. What is the length of nano particle?

- (a) 1–50m              (b) 1–100cm  
(c) 1–100nm          (d) 1–1000nm

4. What is the fuel value of anthracite coal?

- (a) 14,500–15,500    (b) 10,500–12,000  
(c) 15,500–16,500    (d) 11,000–15,000

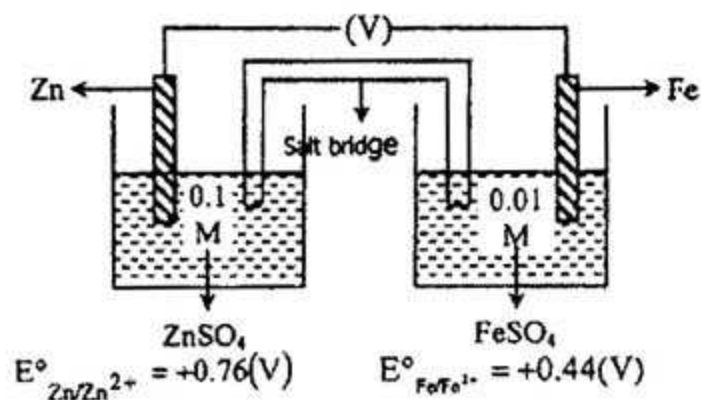
5. Raw material of Portland cement is—

- i.  $\text{CaO}$                 ii.  $\text{SiO}_2$   
iii.  $\text{Na}_2\text{B}_4\text{O}_7 \cdot \text{H}_2\text{O}$

Which one is correct?

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

Answer the following question no 6 and 7 according to the stem:



6. According to the stem—

- i.  $E^\circ_{\text{cell}} = E^\circ_{\text{Zn/Zn}^{2+}} + E^\circ_{\text{Fe/Fe}^{2+}}$   
ii.  $E^\circ_{\text{cell}} = E^\circ_{\text{Zn/Zn}^{2+}} - E^\circ_{\text{Fe/Fe}^{2+}}$   
iii.  $E^\circ_{\text{cell}} = E^\circ_{\text{Zn/Zn}^{2+}} + E^\circ_{\text{Fe}^{2+}/\text{Fe}}$

Which one is correct?

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

7. What is the cell potential of the cell in the stem?

- (a) + 1.2                (b) - 1.2  
(c) + 0.32              (d) - 0.32

8.  $\text{Zn}(\text{S}) + \text{H}_2\text{SO}_4(\text{aq}) \rightleftharpoons \text{ZnSO}_4(\text{aq}) + \text{H}_2(\text{g})$

Which one of the following cell represent cell of the above reaction?

- i.  $\text{Zn/Zn}^{2+} \parallel \text{H}^+/\text{H}_2, \text{Pt}$   
ii.  $\text{Zn}^{2+}/\text{Zn} \parallel \text{H}^+/\text{H}_2, \text{Pt}$   
iii.  $\text{Zn/Zn}^{2+} \parallel \text{H}_2/\text{H}^+, \text{Pt}$

Which one is correct?

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

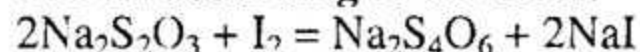
9. Which of the following heavy metal enters into the food chain through storage battery?

- (a)  $\text{Cd}$                     (b)  $\text{As}$   
(c)  $\text{Pb}$                     (d)  $\text{Cr}$

10. How much electricity is needed for the oxidation of  $\text{H}_2 + \frac{1}{2} \text{O}_2 \rightarrow \text{H}_2\text{O}$ ?

- (a) 193000 coulomb  
(b) 96500 coulomb  
(c) 48500 coulomb  
(d) 38600 coulomb

Answer the following question no 11 and 12 according to the stem.



11.  $\star$  The reaction is—

- i. Redox                ii. iodimetry  
iii. iodometry

Which one is correct?

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

12.  $\star$  Which one is oxidized in the above reaction?

- (a)  $\text{Na}_2\text{S}_2\text{O}_3$             (b)  $\text{Na}_2\text{S}_4\text{O}_6$   
(c)  $\text{I}_2$                     (d)  $\text{NaI}$



13. What do mean by 16gm methane gas?

- i. One mole methane
- ii. Avogadro's number of methane molecule
- iii. Volume of methane gas is 22.4 litre at STP

Which one is correct?

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

14. Which one of the following is conjugate acid of  $\text{OH}^+$  ion?

- (a)  $\text{H}_3\text{O}^+$
- (b)  $\text{H}_2\text{O}$
- (c)  $\text{O}^{2-}$
- (d)  $\text{O}_2$

15.  $\text{CH}_3\text{COOH}(\text{aq}) + \text{NaOH}(\text{aq}) \rightarrow \text{NH}_4\text{Cl}$ .

Which of the following indicator is suitable for the titration of above reaction?

- (a) Methyl orange
- (b) Methyl red
- (c) Thimol blue
- (d) Phenolphthalein

16. Which one of the following acts both as oxidizing and reducing agent?

- (a)  $\text{Fe}^{3+}$
- (b)  $\text{Sn}^{4+}$
- (c)  $\text{Zn}^{2+}$
- (d)  $\text{Sn}^{2+}$

17. Molar concentration of 10% NaCl is —

- (a) 170.9 mol/L
- (b) 0.1709 mol/L
- (c) 1.709 mol/L
- (d) 17.09 mol/L

18. How much gram of CaO will be obtained when 15g of  $\text{CaCO}_3$  is heated?

- (a) 4.89
- (b) 8.4
- (c) 12.96
- (d) 10.5

19. For the reaction,  $2\text{KMnO}_4 + 3\text{H}_2\text{SO}_4 + 5\text{H}_2\text{C}_2\text{O}_4 \rightarrow 2\text{MnSO}_4 + \text{K}_2\text{SO}_4 + 10\text{CO}_2$

- i. 10 electrons are gained in molecules of  $\text{KMnO}_4$
- ii. Oxidation of carbon in  $\text{H}_2\text{C}_2\text{O}_4$  is -2
- iii. Dilute  $\text{H}_2\text{SO}_4$  is an oxidant

Which one is correct?

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

20. Which one of the following is Lewis base?

- (a)  $\text{NF}_3$
- (b)  $\text{HCl}$
- (c)  $\text{AlCl}_3$
- (d)  $\text{CO}_2$

21. At a fixed pressure volume of a fixed mass of gas becomes zero at —

- i. 0K temperature
- ii.  $-273^\circ\text{C}$  temperature
- iii.  $0^\circ$  temperature

Which one is correct?

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

22. Chiral carbon containing alcohol is—

- (a) 2-methyl-2-butanol
- (b) Butanol-2
- (c) 2-methyl-1-butanol
- (d) n-butanol

23. What is produced when a mixture of aqueous solution of  $\text{CHCl}_3$  and  $\text{NaOH}$  in phenol is heated at  $60^\circ\text{C}$  temperature?

- (a) Ortho hydroxybenzaldehyde
- (b) n-nitrosophenol
- (c) Salicylic acid
- (d) Sodium

24. The formula  $\text{C}_4\text{H}_{10}\text{O}$  represent which of the following class of compounds?

- i. Carbonyl
- ii. Alcohol
- iii. Ether

Which one is correct?

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

25. Which one of the following is not the component of cement-clinker?

- (a) Calcium silicate
- (b) Calcium aluminate
- (c) Magnesium oxide
- (d) Sodium oxide

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