

CHEMISTRY — 2019

PART B - ANSWER BOOKLET

Fill in the codes for the province and school and your 3-digit candidate number.

Year		Province		School			Candidate Number		
1	9								

Write your name and school in the spaces provided.

Candidate Name: WASA SIBMA *WASA*

School Name: _____

Answers written on the QUESTION paper or any other paper will NOT be marked. Write answers in the spaces as provided on this answer booklet.

FOR MARKERS USE ONLY

PART B	SCORE	MARKERS INITIALS	
		M1	M2
QUESTION 31			
QUESTION 32			
QUESTION 33			
QUESTION 34			
QUESTION 35			
QUESTION 36			
QUESTION 37			
QUESTION 38			
QUESTION 39			
QUESTION 40			
FINAL TOTAL			

PART B: Answer Booklet

Write your answer in the space provided below. Your answers must be clear and precise.

12.5 QUESTION 31		
A.	i. <u>Plants</u>	1
	ii. <u>Alkaloids</u>	1
B.	i. <u>Explosives</u>	1
	ii. <u>Smelting</u>	1
C.	i. <u>sedimentation of the river system - alternatives - loss of marine life, loss of large vegetation, contamination of water,</u>	1
	ii. <u>Law and order problems - alternatives - Civil war, migration, loss of cultural values, etc.</u>	1
	iii. <u>Deep sea tailings Deposition by a pipe line.</u>	1
For Markers Use Only		Q31 Total

11.3 QUESTION 32		
A.	i. <u>Iron(III) hydroxide</u>	1
	ii. <u>$Fe^{3+} + 3OH^{-} \rightarrow Fe(OH)_3(s)$</u> <u>(aq) (aq)</u>	1
B.	i. type of reaction <u>Displacement / redox</u>	1
	ii. reducing agent: <u>Zn (Zinc)</u>	1
	oxidising agent: <u>Cu (Copper ion)</u>	1
C.	<u>Endothermic</u>	
	<u>Because the reaction absorbs energy from the surroundings.</u>	2
For Markers Use Only		Q32 Total

11.1 QUESTION 33

- A. i. Movement of particles among each other so that they become evenly mixed. 1
- ii. Perfume particles mix by colliding with air particles and bouncing off in all directions. 1
- B. $V = \frac{nRT}{P} = \frac{3 \text{ mol} \times 0.082 \text{ atm} \cdot \text{L/mol} \cdot \text{K} \times 303 \text{ K}}{0.9 \text{ atm}} = 82.82 \text{ L}$
 Answer: 82.82 L
- C. Decrease ~~82.82 L~~
- D. i. Decrease liquids that do not mix into each other. 1
- ii. Fractional distillation 1
- E. $\begin{matrix} 12g \\ \nearrow \\ 75g \text{ water} \\ \searrow \\ 100g \text{ water} \\ n = 16g \end{matrix}$
 Answer: 16g 1

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Q33 Total

12.3 QUESTION 34

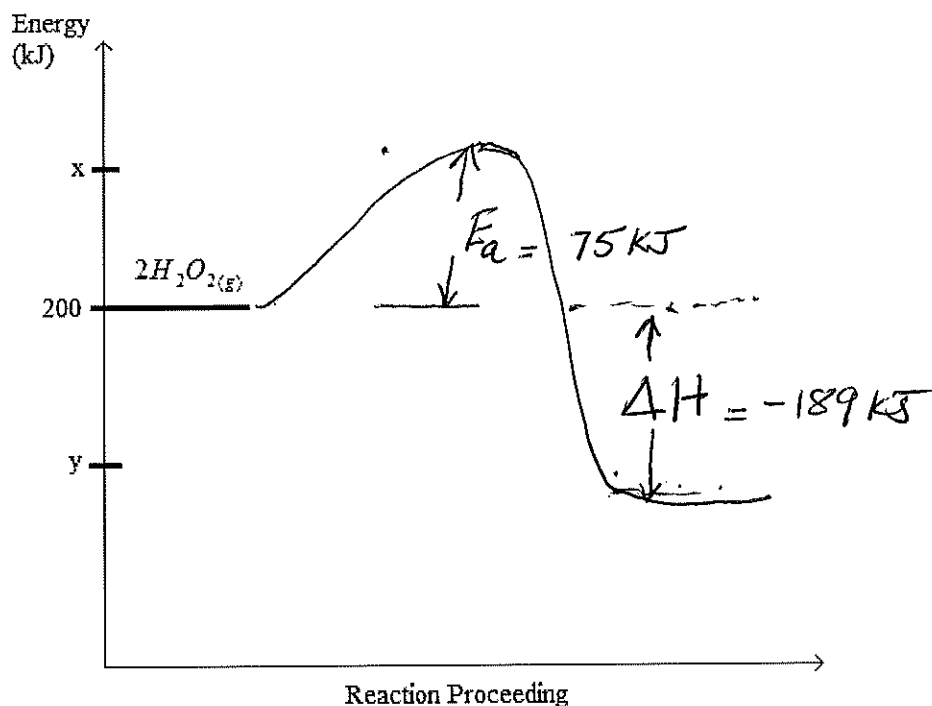
- A. i. $Zn_{(s)} \rightarrow Zn^{2+}_{(aq)} + 2e^{-}$ $E^{\circ} = -0.76V$ 1
- ii. $E^{\circ} = E_{red} - E_{ox}$
 $= +0.34 - (-0.76)$
 $= 1.1V$
 Answer: 1.1V 1
- B. i. $2H^{+}_{(aq)} + 2e^{-} \rightarrow H_{2(g)}$ 1
- ii. gas A chlorine 1
- iii. half equation $2Cl^{-} \rightarrow Cl_{2} + 2e^{-}$ 1
- iv. Ions not involved in electrolysis Na^{+} and OH^{-} 2

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Q34 Total

11.4 QUESTION 35

A. i.



3

ii. $y = 200 - 189 = 11 \text{ kJ}$

$y = 11 \text{ kJ}$

1

B.

$$\text{Rate} = \frac{\Delta \text{Vol}}{\Delta \text{Time}} = \frac{60 - 60}{60 - 60} = 0$$

Answer: 0 mL/s

1

C. i.

$$6 \times \text{N-H} = 6 \times 391 = 2346 \text{ kJ}$$

Answer: 2346 kJ

1

ii.

$$1 \times \text{N} \equiv \text{N} = 945 \text{ kJ}$$

$$3 \times \text{H-H} = 3 \times 432 = 1296 \text{ kJ}$$

$$\text{Total} = 945 \text{ kJ} + 1296 \text{ kJ} = 2241 \text{ kJ}$$

Answer: 2241 kJ

1

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Q35 Total

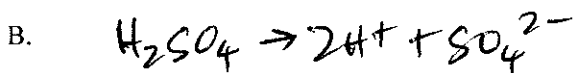
12.4 QUESTION 36		
A.	Each member of alkane series increases by one carbon and two hydrogen atoms ($-CH_2$).	1
B.	4-ethyl-3-methylheptane	2
C.	i. Structural formula of 2-methyl-2-propanol	
	$\begin{array}{c} CH_3 \\ \\ CH_3 - C - CH_3 \\ \\ OH \end{array} \quad \text{or} \quad \begin{array}{c} CH_3 \\ \\ \diagdown \quad \diagup \\ \\ OH \end{array}$	2
	ii. Structural formula of propanoic acid	
	$\begin{array}{c} H & H & & \\ & & & \\ H - C - C - C = O \\ & & / & \\ H & H & & OH \end{array} \quad \text{or} \quad \begin{array}{c} \diagup \\ \\ \diagdown \quad \diagup \\ \\ OH \end{array}$	2
For Markers Use Only		Q36 Total

11.5 QUESTION 37		
A.	i. Sulphur and or	1
	ii. oxygen	1
B.	i. Superphosphate	1
	ii. $x = Ca(H_2PO_4)_2(s)$	1
	$y = 2CaSO_4(s)$	1
C.	Silicon	1
D.	$x \rightarrow 2NO_2(g)$	1
For Markers Use Only		Q37 Total

12.2 QUESTION 38

A. Sulphuric acid

1

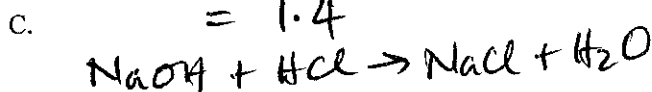


$$[\text{H}^+] = 2 \times 0.02 \text{ M}$$

$$\text{pH} = -\log[\text{H}^+] \\ = -\log(2 \times 0.02)$$

Answer: 1.4

2



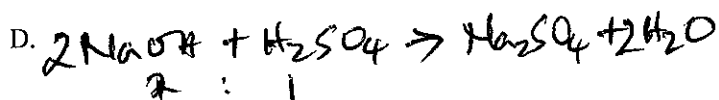
$$n \text{NaOH} = c \times V \\ = 0.20 \times 0.02 \\ = 4 \times 10^{-3} \text{ mol}$$

mol ratio is HCl: NaOH is 1:1

$$n \text{HCl} = n \text{NaOH} \\ = 4 \times 10^{-3} \text{ mol}$$

$$\text{Vol of HCl} = \\ V = \frac{n}{c} \\ = \frac{4 \times 10^{-3}}{0.40} \\ = 0.01 \text{ L (ie. 10 mL)}$$

Answer: 0.01 L or 10 mL

2 mol of NaOH reacted with 1 mol H_2SO_4

$$\therefore n \text{H}_2\text{SO}_4 = \frac{1}{2} \times n \text{NaOH} \\ = \frac{1}{2} \times 4 \times 10^{-3} \\ = 2 \times 10^{-3} \text{ mol}$$

$$\text{Vol of HCl} \\ V = \frac{n}{c} \\ = \frac{2 \times 10^{-3}}{0.40} \\ = 5 \times 10^{-3} \text{ L or 5 mL}$$

Answer: 0.005 L or 5 mL

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Q38 Total

11.2 QUESTION 40		
A.	Outer shell diagram for methane	
		2
B.	i. <u>Good electrical conductivity, Metals have high mp</u>	1
	ii. <u>Easily malleable, ductile, Good conductor of heat</u>	1
C.	i. <u>Atomic radii increases down a group</u>	
	ii. <u>Down the group more shells are added which increases atomic radii</u>	1
		1
D.	<u>Mg atoms contribute 2e⁻ to sea of electron so strong attraction between positive nucleus and electrons while Na atoms contribute 1e so attraction between e and Na⁺ is less.</u>	1
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