

TRIAL Midterm Examination

Name and surname:	Student No
Signature:	Group: <i>(Lose 2 mark if incorrect)</i>

INSTRUCTIONS:

- Write your name, surname and group no. on the question booklet. If group number is incorrect you **will lose 1 point**.
- The exam consists of 5 questions worth 100 points. 1. question is multiple choice questions, mark only one choice. To get full marks, answer all questions. **Show all steps in your answers in questions from question 2 to question 4.**
- The Periodic Table provided may be necessary to answer some of the questions.
- Use of mobile phones, exchange of calculators or rubbers is not allowed.

Periodic Table of Elements

1 H 1.008	2 He 4.003																
3 Li 6.94	4 Be 9.01											5 B 10.81	6 C 12.01	7 N 14.01	8 O 16.00	9 F 19.00	10 Ne 20.18
11 Na 22.99	12 Mg 24.30											13 Al 26.98	14 Si 28.09	15 P 30.97	16 S 32.07	17 Cl 35.45	18 Ar 39.95
19 K 39.10	20 Ca 40.08	21 Sc 44.96	22 Ti 47.88	23 V 50.94	24 Cr 52.00	25 Mn 54.94	26 Fe 55.85	27 Co 58.93	28 Ni 58.69	29 Cu 63.54	30 Zn 65.39	31 Ga 69.72	32 Ge 72.61	33 As 74.92	34 Se 78.96	35 Br 79.90	36 Kr 83.80
37 Rb 85.47	38 Sr 87.62	39 Y 88.91	40 Zr 91.22	41 Nb 92.91	42 Mo 95.94	43 Tc 98.91	44 Ru 101.07	45 Rh 102.91	46 Pd 106.42	47 Ag 107.87	48 Cd 112.41	49 In 114.82	50 Sn 118.71	51 Sb 121.75	52 Te 127.6	53 I 126.90	54 Xe 131.29
55 Cs 132.91	56 Ba 137.33	71 Lu 174.97	72 Hf 178.49	73 Ta 180.95	74 W 183.85	75 Re 186.2	76 Os 190.2	77 Ir 192.22	78 Pt 195.08	79 Au 196.97	80 Hg 200.59	81 Tl 204.38	82 Pb 207.2	83 Bi 208.98	84 Po 208.98	85 At 209.99	86 Rn 222.02
87 Fr 223.02	88 Ra 226.03	103 Lr 260.11															

Lanthanides	57 La 138.91	58 Ce 140.12	59 Pr 140.91	60 Nd 144.24	61 Pm 146.92	62 Sm 150.36	63 Eu 151.97	64 Gd 157.25	65 Tb 158.93	66 Dy 162.50	67 Ho 164.93	68 Er 167.26	69 Tm 168.93	70 Yb 173.04
Actinides	89 Ac 227.03	90 Th 232.04	91 Pa 231.04	92 U 238.03	93 Np 237.05	94 Pu 244.06	95 Am 243.06	96 Cm 247.07	97 Bk 247.07	98 Cf 251.08	99 Es 252.08	100 Fm 257.10	101 Md 258.10	102 No 259.10

USEFUL CONSTANTS and RELATIONSHIPS

$$N_A = \frac{6.022 \times 10^{23}}{\text{mol}},$$

Leave blank! For instructor's use	Q1 (25 points)	Q2 (25 points)	Q3 (25 points)	Q4 (25 points)	TOTAL (100 points)

Question 1

MULTIPLE CHOICE QUESTIONS

I. Which of the following observations is/are examples of chemical change?

1. Iron (Fe) rusts, forming Fe_2O_3 .
2. The density of water increases when it changes from a solid to a liquid.
3. Sodium chloride melts at 801°C .

- a. 1 only
- b. 2 only
- c. 3 only
- d. 1 and 2
- e. 2 and 3

II. Of the following which is NOT a pure substance?

- a. gold
- b. sugar
- c. water
- d. air
- e. methane

III. Give the correct number of significant figures to the problem below.

$$5.80 \times 10^{-1} - 3.4 \times 10^{-2} =$$

- a. 5.5×10^{-1}
- b. 5.46×10^{-1}
- c. 2.4×10^{-3}
- c. 2.4×10^2
- d. 5.5×10^{-2}

IV. What is the mass number of an argon atom with 22 neutrons?

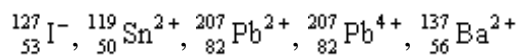
- a. 2
- b. 18
- c. 22
- d. 40
- e. 39.95

V. How many protons, neutrons, and electrons are in a silver atom with a mass number of 108?

- a. 47 protons, 47 neutrons, 61 electrons

- b. 47 protons, 61 neutrons, 47 electrons
- c. 61 protons, 47 neutrons, 47 electrons
- d. 47 protons, 108 neutrons, 47 electrons
- e. 61 protons, 108 neutrons, 61 electrons

VI. Which two of the ions below have the same number of electrons?



- a. ${}_{53}^{127}\text{I}^{-}$ and ${}_{56}^{137}\text{Ba}^{2+}$
- b. ${}_{53}^{127}\text{I}^{-}$ and ${}_{50}^{119}\text{Sn}^{2+}$
- c. ${}_{82}^{207}\text{Pb}^{2+}$ and ${}_{56}^{137}\text{Ba}^{2+}$
- d. ${}_{50}^{119}\text{Sn}^{2+}$ and ${}_{56}^{137}\text{Ba}^{2+}$
- e. ${}_{82}^{207}\text{Pb}^{2+}$ and ${}_{82}^{207}\text{Pb}^{4+}$

VII. What is the identity of ${}_{25}^{55}\text{X}$?

- a. zinc
- b. silver
- c. iridium
- d. cesium
- e. manganese

VIII. How many **non-metallic** elements are there in group 13?

- a. 0
- b. 1
- c. 2
- d. 3
- e. 4

Question 2

2-1- Calculate number of Ca atoms are there in 4.88 g Ca?

2-2- How many moles of N are there in 5.60×10^{14} N molecules?

2-3- How many moles of C are there in 2.75 mol C_6H_{14} molecules?

Question 3

3- Calculate the mass percent composition of each element in C_2H_5Cl

Question 4

4- Silver chloride, $AgCl$, often used in silver plating, contains 75.27% Ag . Calculate the mass of silver chloride required to plate 170 mg of pure silver.