



Date: 26 / 12 /2022

Midterm Exam

First Semester/2022-2023

Name:

Student No.:

Section (الشعبة) :.....

Instructor name:

Exam time: 75 min.

Question no.	A	B	C	D	Question no.	A	B	C	D
1					10				
2					11				
3					12				
4					13				
5					14				
6					15				
7					16				
8					17				
9					18				

1 H Hydrogen 1.01																	2 He Helium 4.00				
3 Li Lithium 6.94	4 Be Beryllium 9.01															5 B Boron 10.81	6 C Carbon 12.01	7 N Nitrogen 14.01	8 O Oxygen 16.00	9 F Fluorine 19.00	10 Ne Neon 20.18
11 Na Sodium 22.99	12 Mg Magnesium 24.31															13 Al Aluminum 26.98	14 Si Silicon 28.09	15 P Phosphorus 30.97	16 S Sulfur 32.07	17 Cl Chlorine 35.45	18 Ar Argon 39.95
19 K Potassium 39.10	20 Ca Calcium 40.08	21 Sc Scandium 44.96	22 Ti Titanium 47.87	23 V Vanadium 50.94	24 Cr Chromium 52.00	25 Mn Manganese 54.94	26 Fe Iron 55.85	27 Co Cobalt 58.93	28 Ni Nickel 58.69	29 Cu Copper 63.55	30 Zn Zinc 65.39	31 Ga Gallium 69.72	32 Ge Germanium 72.61	33 As Arsenic 74.92	34 Se Selenium 78.96	35 Br Bromine 79.90	36 Kr Krypton 83.80				
37 Rb Rubidium 85.47	38 Sr Strontium 87.62	39 Y Yttrium 88.91	40 Zr Zirconium 91.22	41 Nb Niobium 92.91	42 Mo Molybdenum 95.94	43 Tc Technetium (98)	44 Ru Ruthenium 101.07	45 Rh Rhodium 102.91	46 Pd Palladium 106.42	47 Ag Silver 107.87	48 Cd Cadmium 112.41	49 In Indium 114.82	50 Sn Tin 118.71	51 Sb Antimony 121.76	52 Te Tellurium 127.60	53 I Iodine 126.90	54 Xe Xenon 131.29				
55 Cs Cesium 132.91	56 Ba Barium 137.33	57 La Lanthanum 138.91	72 Hf Hafnium 178.49	73 Ta Tantalum 180.95	74 W Tungsten 183.84	75 Re Rhenium 186.21	76 Os Osmium 190.23	77 Ir Iridium 192.22	78 Pt Platinum 195.08	79 Au Gold 196.97	80 Hg Mercury 200.59	81 Tl Thallium 204.38	82 Pb Lead 207.2	83 Bi Bismuth 208.98	84 Po Polonium (209)	85 At Astatine (210)	86 Rn Radon (222)				
87 Fr Francium (223)	88 Ra Radium (226)	89 Ac Actinium (227)	104 Rf Rutherfordium (261)	105 Db Dubnium (262)	106 Sg Seaborgium (266)	107 Bh Bohrium (264)	108 Hs Hassium (269)	109 Mt Meitnerium (268)													

58 Ce Cerium 140.12	59 Pr Praseodymium 140.91	60 Nd Neodymium 144.24	61 Pm Promethium (145)	62 Sm Samarium 150.36	63 Eu Europium 151.96	64 Gd Gadolinium 157.25	65 Tb Terbium 158.93	66 Dy Dysprosium 162.50	67 Ho Holmium 164.93	68 Er Erbium 167.26	69 Tm Thulium 168.93	70 Yb Ytterbium 173.04	71 Lu Lutetium 174.97
90 Th Thorium 232.04	91 Pa Protactinium 231.04	92 U Uranium 238.03	93 Np Neptunium (237)	94 Pu Plutonium (244)	95 Am Americium (243)	96 Cm Curium (247)	97 Bk Berkelium (247)	98 Cf Californium (251)	99 Es Einsteinium (252)	100 Fm Fermium (257)	101 Md Mendelevium (258)	102 No Nobelium (259)	103 Lr Lawrencium (262)

QUESTION ONE (18 POINTS) الرجاء نقل رمز الإجابة الصحيحة على الجدول في الصفحة الأولى

1- The **SI units** for mass is:

- a- g b- kg c- mg d- ng

2- A body temperature is **40.0 °F**. This temperature in **Celsius** is:

- a- 4.4 °C b- 129.6 °C c- -14.4 °C d- 40.0 °C

3- Express this number in **scientific notation** 0.00000720

- a- 7.2×10^6 b- 7.20×10^6 c- 7.2×10^{-6} d- 7.20×10^{-6}

4- The answer of $(3.8621 \times 1.5630) - 5.98$ is written as:

- a- 0.06 b- 0.056 c- 0.0565 d- 0.05646

5- **10⁻⁹** is related to **prefix**:

- a- micro b- nano c- pico d- milli

6- Which one of the following is an **alkali earth metal**?

- a- Mg b- K c- He d- B

7- Which one of the following molecular formulas is also an **empirical formula**?

- a- C₂H₆S₂O₄ b- C₆H₆O₂ c- H₂O d- H₂P₄O₆

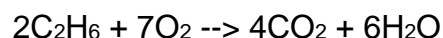
8- The element that **located** in period 3, group 2A is:

- a- Se b- K c- Sn d- Mg

9- Which pair of atoms constitutes a pair of **isotopes** of the same element?

- a- $^{14}_6\text{X}$ $^{14}_7\text{X}$ b- $^{14}_6\text{X}$ $^{12}_6\text{X}$ c- $^{17}_9\text{X}$ $^{17}_8\text{X}$ d- $^{19}_{10}\text{X}$ $^{19}_9\text{X}$

10- How many **molecules of O₂** would react with 56 molecules of C₂H₆?
(Avog.no.=6.022x10²³)



- a- 784 b- 196 c- 392 d- 112

11- Calculate the **percent composition of oxygen**, % O, in Na_2CO_3

- a- 57.1% b- 45.3% c- 43.0% d- 0.57%

12- Which one of the following ionic compounds is **soluble**?

- a- CuSO_4 b- $\text{Sr}(\text{OH})_2$ c- FePO_4 d- BaSO_4

13- Which substance below is a **weak** acid in aqueous solution?

- a- HF b- HCl c- HNO_3 d- H_2SO_4

14- What is the **oxidation number** of **Au** in KAuCl_5 ?

- a- +4 b- +5 c- +2 d- +3

15- **What volume** of 0.105 M aqueous NaOH solution is required to neutralize 40.0 mL of 0.210 M aqueous H_2SO_4 solution?

- a- 10.0 mL b- 80.0 mL c- 40.0 mL d- 160.0 mL

16- In the equation: $\text{HF} + \text{H}_2\text{O} \rightleftharpoons \text{H}_3\text{O}^+ + \text{F}^-$

- a- H_2O is a base and HF is its conjugate acid.
b- H_2O is an acid and HF is the conjugate base.
c- HF is an acid and F^- is its conjugate base.
d- HF is a base and H_3O^+ is its conjugate acid.

17- If a solution has a **pOH = 2.9**, the solution will be:

- a- basic b- neutral c- acidic d- none

QUESTION TWO (2 POINTS)

Given the following: 42.07g Na, 18.89 g P, and 39.04 g O. Determine the empirical formula. (Molar mass of Na = 22.98 g/mol, P = 30.97 g/mol, O = 16 g/mol).

QUESTION THREE (3 POINTS)

a- Write a balanced chemical equation for the reaction of solid iron with bromine gas to produce iron(III)bromide solid.

b- Complete the reaction:



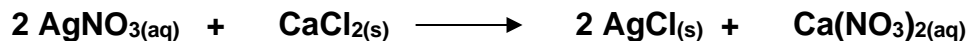
What is the:

Net ionic equation :

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QUESTION FOUR (4.5 POINTS)

a- If 0.50 g CaCl_2 (Mwt: 110.98 g/mol) is added to 15.0 mL of 0.100 M AgNO_3 , what is the mass in grams of AgCl precipitate (Mwt: 143.32 g/mol) ?



b- Find the percentage yield (% yield) if the actual yield of AgCl is 0.175g.

QUESTION FIVE (2 POINTS)

A 5.00×10^2 mL sample of 2.00 M HCl solution is treated with 4.47 g of magnesium (Mg). Calculate the concentration of the acid solution after all the metal has reacted. Assume that the volume remains unchanged

QUESTION SIX (2.5 POINTS)

- a- Calculate the pH of a 0.24 M sodium formate solution (HCOONa).
(K_a for HCOOH = 1.8×10^{-4})

- b- 0.23M of weak acid that has the percent of dissociation is 1.5 % , calculate K_a of acid. $\%H^+ = \frac{[H^+]}{[acid]} \times 100\%$