

امتحان منتصف الفصل

06/12/2023 Wednesday : Day and Date / اليوم والتاريخ

Department:	القسم: العلوم الأساسية العلمية	Faculty:	الكلية: الآداب والعلوم التربوية
Semester:	الفصل الدراسي: الأول	Academic Year	العام الجامعي 2024-2023
Course Name & No.:	اسم المادة ورقمها: كيمياء عامة 0181301		
Room No.:	رقم القاعة:	Section No.:	رقم الشعبة: 1-10
No. of Pages:	عدد الصفحات:	Exam time and Duration	وقت الامتحان ومدته
		1:30 - 2:30	1 hour
		☐ امتحان نهائي (Final Exam) ☒ اختبار منتصف الفصل (Exam)	
Coordinator's Name	اسم المنسق (للمواد المشعبة): Dr. Tamara Ghrear		
Instructor's signature:	اسم مدرس المادة:		
	Dr. Tamara Ghrear Dr. Abdullah Ghawanmeh Dr. Aya Al-Zuheiri		
	توقيع مدرس المادة: 		

Student's ID No.:	الرقم الجامعي:	Student's Name	اسم الطالب:
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PLO	CLO	علامة السؤال Question Mark	السؤال Question
	1-3		الأول Q1
	1-3		الثاني Q2
	1-3		الثالث Q3
	1-3		الرابع Q4
			الخامس Q5
			السادس Q6
			السابع Q7
			الثامن Q8
			التاسع Q9
			العاشر Q10
			المجموع الكلي

1. ~~A~~ B C D

7. A ~~B~~ C D

2. A B ~~C~~ D

8. ~~A~~ B C D

3. A B C ~~D~~

9. A B C ~~D~~

4. A ~~B~~ C D

10. A B ~~C~~ D

5. ~~A~~ B C D

11. A B ~~C~~ D

6. ~~A~~ B ~~C~~ D

12. A B ~~C~~ D

Q1) Circle the correct answer for each of the following questions: (12 marks)

1- Convert the temperature of 380 K (kelvin) to Celsius degree ($T_K = T_C + 273$)

~~A) 107 °C~~

B) 47 °C

C) 77 °C

D) 100 °C

$$T_K = T_C + 273$$

$$T_C = T_K - 273$$

$$= 380 - 273$$

$$= 107$$

2- Evaluate the expression to the correct number of significant figures.

$$(12.35 - 6.705) \times 2.8$$

A) 15.82

B) 15.8

~~C) 16~~

D) 16.00

$$5.645$$

$$5.65 \times 2.8$$

$$15.82$$

$$16$$

3- Which of the following represents a pair of isotopes?

	Atom (A)		Atom (B)	
	Atomic number	Mass number	Atomic number	Mass number
A)	17	35	14	37
B)	14	28	18	30
C)	14	28	16	28
D)	12	25	12	26

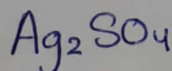
4- In Ag_2SO_4 the molar mass in g per mol is

A) 187.55

~~B) 311.87~~

C) 300.17

D) 150.00



$$(2 \times 107.87) + 32.06 + 4 \times 15.999$$

5- The molecular formula of Tin (II) nitrite is:

- ~~A) $\text{Tn}(\text{NO}_2)_2$~~
- B) Tn_3N_3
- C) Tn_3N_2
- D) $\text{Tn}(\text{NO}_3)_2$

6- In $^{59}_{28}\text{Ni}^{3+}$ the number of proton----- neutron ----- electron-----

- ~~A) 28 protons; 31 neutrons; 25 electrons~~
- B) 25 protons; 31 neutrons; 28 electrons
- ~~C) 28 protons; 31 neutrons; 25 electrons~~
- D) 28 protons; 31 neutrons; 31 electrons

7- The mass of 343 mL of a substance with a density of 1.53 g/mL is:

- ~~A) 524.8~~
- ~~B) 525~~
- C) 524.79
- D) 500

$$d = \frac{m}{V}$$

$$m = d * V$$

$$= 1.53 * 343$$

$$= 524.79 \rightarrow 525$$

8- Which of the following are examples of a physical change?

- ~~A) Evaporation the water of ocean~~
- B) carbon burns
- C) React hydrogen with oxygen to produce water.
- D) React hydrogen with nitrogen to produce NH_3

9- How many significant figures should be displayed in the result of the number, ~~0.002433010~~?

- A) 8
B) 6
C) 5
~~D) 7~~

10- Which of the following is balance equation?

- A) $\text{BaCl}_2 + \text{Na}_3\text{PO}_4 \longrightarrow \text{Ba}_3(\text{PO}_4)_2 + \text{NaCl}$
B) $3\text{BaCl}_2 + \text{Na}_3\text{PO}_4 \longrightarrow \text{Ba}_3(\text{PO}_4)_2 + 6\text{NaCl}$
~~C) $3\text{BaCl}_2 + 2\text{Na}_3\text{PO}_4 \longrightarrow \text{Ba}_3(\text{PO}_4)_2 + 6\text{NaCl}$~~
D) $\text{BaCl}_2 + 2\text{Na}_3\text{PO}_4 \longrightarrow \text{Ba}_3(\text{PO}_4)_2 + 6\text{NaCl}$

11- Convert the (8.8 mile / gal) to (Km / L)
If you know (1 gal = 3.784 L) (1 mile = 1.609 km)

- A) 3.74 Km/L $\frac{8.8 \text{ mile}}{\text{gal}} * \frac{1.609 \text{ km}}{1 \text{ mile}} * \frac{1 \text{ gal}}{3.784 \text{ L}}$
B) 3.742 Km/L
~~C) 3.7 Km/L~~
D) 3.70 Km/L 3.74186

12- Which of the following is ionic compound?

- A) $\text{C}_6\text{H}_{12}\text{O}_6$
B) PCl_5
~~C) K_2O~~
D) N_2O_3

Q2) Answer each of the following questions after reading carefully:

The student was prepared 8.82 g of iron(III) sulphate ($\text{Fe}_2(\text{SO}_4)_3$), help the student to calculate (M.wt=399.91 g/mol, $N_A=6.022 \times 10^{23}$ atoms/mol) (2 marks)

A) The atoms of oxygen. 1marks

$$\textcircled{1} n \text{ Fe}_2(\text{SO}_4)_3 = \frac{m}{M_{wt}} = \frac{8.82}{399.91} = 0.0221$$

$$\textcircled{2} 1 \text{ mole Fe}_2(\text{SO}_4)_3 \rightarrow 12 \text{ mol O} \\ 0.0221 \rightarrow ?$$

$$\star n(\text{O}) = 0.0221 \times 12 = 0.265 \text{ mol}$$

$$\textcircled{3} n(\text{O}) = \frac{\text{no. of atom}}{N_A} \rightarrow \text{no. of atom} = 0.265 \times 6.022 \times 10^{23} = 1.60 \times 10^{23}$$

B) The percentage composition of the sulfur (S)? 1marks

$$\textcircled{1} n(\text{S}) = ? \\ 1 \text{ mole Fe}_2(\text{SO}_4)_3 \rightarrow 3 \text{ mole S}$$

$$\textcircled{1A} \text{ من النسبة } \leftarrow 0.0221 \rightarrow ?$$

$$0.0663 \text{ mole}$$

$$\textcircled{2} m(\text{S}) = n \times M_{wt} \rightarrow 0.0663 \times 32.06 = 2.13 \text{ g}$$

$$\textcircled{3} \% \text{ S} = \frac{m(\text{S})}{\text{Total mass}} \times 100\%$$

$$= \frac{2.13}{8.82} \times 100\%$$

$$24.1\%$$

Q3) For a compound with a percent composition by mass of 13.8% P, 18.8% N, and 15.8% Cl and a molar mass of 480 g/mol, determine the empirical formula and molecular formula. 4marks

P	N	Cl
13.8%	18.8%	15.8%

assume we have 100 g

13.8 g	18.8	15.8
<u>30.974</u>	<u>14.007</u>	<u>35.45</u>

0.446	1.34	0.446
<u>0.446</u>	<u>0.446</u>	<u>0.446</u>

P ₁	N ₃	Cl ₁
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$$E.F = \text{P}_1\text{N}_3\text{Cl}_1$$

$$M_{wt} = 30.974 + 3(14.007) + 35.45 = 108.445 \text{ g/mol}$$

$$n = \frac{M_{wt} M.F}{M_{wt} E.F}$$

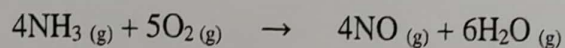
$$= \frac{480}{108.445} = 4.4 \approx 4$$

$$M.F = (E.F)_n$$

$$= (\text{P}_1\text{N}_3\text{Cl}_1) \times 4$$

$$M.F = \text{P}_4\text{N}_{12}\text{Cl}_4$$

Q4) If you know of (5.52 g) Ammonia (NH_3) reacts with (3.00 g) oxygen to produce nitrogen monoxide (NO) (7 marks)



A) Calculate the mass of NO

$$4\text{NH}_3 + 5\text{O}_2 \rightarrow 4\text{NO} + 6\text{H}_2\text{O}$$

2.00 17.031 $\frac{5.52}{17.031}$ $\frac{0.324}{4}$ 0.081	$\frac{3.00}{31.998}$ $\frac{0.0938}{5}$ $\frac{0.0188}{\text{L.R}}$	$5 \text{ mol O}_2 \rightarrow 4 \text{ NO}$ $0.0938 \rightarrow ?$ $n_{\text{NO}} = 0.0938 \times \frac{4}{5}$ $= 0.0750$ $m = n \times \text{Mwt}$ $= 0.0750 \times 30.006$ $= 2.25 \text{ g}$
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B) Calculate the percentage yield if the mass of NO is 1.14 g?

$$\begin{aligned} \% \text{ NO} &= \frac{\text{actual}}{\text{Theoretical}} \times 100\% \\ &= \frac{1.14}{2.25} \times 100\% \\ &= 50.7\% \end{aligned}$$