

Philadelphia University Faculty of Science Basic Sciences Department First Semester 2023-2024 Date: 30 / 1/2024

General Chemistry for Health Science - 0216145 Exam time: 120 min Instructor name:

Name: Student No.: Section (الشعبة)

Question no.	Α	В	С	D	Question no.	Α	В	C	D
1					17				
2					18				
3					19				
4					20				
5					21				
6					22				
7					23				
8					24				
9					25				
10					26				
11					27				
12					28				
13					29				
14					30			1	
15					31				
16					32				

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 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 lodine 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 TI 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)									

Circle the Correc	<u>t Answer</u> (1.25 pc	oint each question)	
		مة الأولى	ل الجدول في الصفح	الرجاء نقل رمز الإجابة الصحيحة على
(gas constant = 0.0	-	-		
1- The number of		in 0.020415 is:		
a- 2	b- 4	c- 5		d- 3
2. H₃PO ₄ is: a- polyatomic mol			ionic compou	
c- polyatomic ions		d-	diatomic mole	ecule
3- 27.22g of X (mo <u>the molar mass of</u>	-	nol) react with 20 g	of Y to form	X₂Y compound. <u>Calculate</u>
a- 30.65	b- 45.56	c- 20.56	d- 40.65	
4- Which chemical	l substance is the	oxidizing agent in t	his reaction?	
2 Sr+ (
2 31+0	-	2 510		
a- Sr	b- Sr ⁺²	c- O ₂		d- 0 ⁻²
5 - A 0.6745 g acid	l sample KHP (KH	IC ₈ H ₄ O ₄) (Molecula	r weight of KI	HP = 204 g/mol).
Reacts with 41.75 <u>KOH solution</u> ?	mL of KOH solution	on for complete ne	utralization. \	What is the <u>molarity of the</u>
a- 0.158 M	b- 0.099 M	c- 0.139	9 M	d- 0.079 M
6- What is the <u>con</u>	centration of Na ⁺	in 0.65 M ,200mL o	of Na ₂ SO ₄ ?	
a- 1.3 M	b- 1.95 M	c- 0.65	5 M	d- 0.325 M
7- For the followir	ng reaction identif	y the <u>conjugate aci</u>	id/base pair	
CH₃COO	H + H₂O ← → CH₃	3COO ⁻ + H₃O ⁺		
a - CH₃COOH /		c- H ₂ O / H ₃ O ⁺		
b- CH₃COOH/ C	CH₃COO ⁻	d- CH ₃ COO ^{- /} H ₃ O ⁻	+	
		2		

b- 37.9%	c- 67		
	C= 07	.3%	d- 73.8%
t 25°C, <u>what is the [H</u> +]	at 25	5°C, if the [OH⁻]	= 2.3×10 ⁻⁵ M?
b- 7×10 ⁻⁷ M	C-	4.35×10 ⁻¹⁰ M	d- 1×10 ⁻¹⁴ M
-	H-] =	0.000700 M and	l indicate whether the solution
	;	c- 10.8, basi	d-11.8, basic
b-6.2x10 ⁻¹⁰ e <u>strongest acid</u> ?		l.6x10 ⁻¹⁴	d-6.2x10 ⁺⁴
,			
b-HF	c- ł	INO ₂	d- CH₃COOH
-	5	g of CH₃COOH ((50 g/mol) in 1.00 L of solution,
b- 4.74	C- 1	1.87	d- 2.87
b- 4.74	c- 1	1.87	d- 2.87
	b- 7×10^{-7} M f of a solution if it's [O eutral. b- 17.2, basic 2×10^{-10} , what is the Kb b-6.2 $\times 10^{-10}$ e strongest acid? b-HF b-HF of a solution containing CH ₃ COOH is 1.8 × 10 ⁻⁵	b- 7×10^{-7} M c- f of a solution if it's [OH ⁻] = eutral. b- 17.2, basic 2x10 ⁻¹⁰ , what is the K _b of its b-6.2x10 ⁻¹⁰ c-2 e strongest acid? b-HF c- H of a solution containing 6.00 CH ₃ COOH is 1.8 × 10 ⁻⁵	I of a solution if it's $[OH^-] = 0.000700$ M and eutral.b- 17.2, basicc- 10.8, basic 2x10⁻¹⁰ , what is the Kb of its conjugate base b-6.2x10 ⁻¹⁰ c-1.6x10 ⁻¹⁴ b-6.2x10 ⁻¹⁰ c-1.6x10 ⁻¹⁴ e strongest acid? b-HFKa of CH ₃ COOH Ka of HNO ₂ = 4.b-HFc- HNO ₂ of a solution containing 6.00 g of CH ₃ COOH (of CH ₃ COOH is 1.8 × 10 ⁻⁵

14- A solution which 0.010 molar HCI <u>has</u>	-	ng 300 mL of 0.020 m	olar NaOH with 700 mL of
a- 2	b- 3	c- 4	d- 5
15- A 0.010 M soluti <u>constant Ka</u> , for this	-	otic acid is 5.0% dissoc	iated. <u>What is the equilibrium</u>
a- 5.0x10 ⁻²	b- 5.0x10 ⁻³	c- 2.5x10⁻⁴	d- 2.5x10 ⁻⁵
16- The <u>instrument</u> u	used to measure the <u>a</u>	tmospheric pressure i	s called
a- Seismometer	b- Hydrometer	c- PH meter	d- Barometer
17- What is the dens	sity of Xe gas at a press	sure of 2.40 atm and a	a temperature of 10°C?
a- 82.3g/L	b- 8.65 g/L	c- 13.6 g/L	d- 0.64 g/L
18- What is the <u>volu</u>	<u>me in L</u> occupied by 5.	58 g of NH₃ at STP?	
a- 125 L	b- 22.4 L	c- 8.0 L	d-7.4 L
	pies a volume of 8.48		ol CH₄, and an unknown n pressure. <u>How many moles</u>

- c- 2.45 mol
- d- 3.77 mol

20- An unknown gaseous hydrocarbon consists of 85.63% carbon by mass. A 0.959-g sample of the gas occupies a volume of 0.51 L at STP. What is the identity of the gas?

- $a C_3 H_6$
- $b C_4 H_8$
- c- CH₂
- d- C₂H₄

21- What is the electron configuration of Mg in MgCl₂compound?

a-1S ² 2S ² 2P ⁶ 3S ²	c- 1S ² 2S ² 2P ⁵
b-1S ² 2S ² 2P ⁶	d- 1S ² 2S ² 2P ⁶ 3S ² 3P ²

22- The electron configuration of Magnesium (Mg) hasunpaired electrons and its

a - 1, paramagnetic	c- 2, Diamagnetic
b- 0, Diamagnetic	d- 2, paramagnetic

23- Which one of the following sets of quantum numbers is not correct?

a- n=4, l=3, m_l= -3, m_s= +1/2 b- n =4, l=2, m_l= +2, m_s= - 1/2 c- n=4, l=4, m_l= +2, m_s= +1/2 d- n=4, l=1, m_l=0, m_s = +1/2

24-What is the	<u>maximum num</u>	ber of electrons in the d-orbital?	
a - 10	b- 6	c-14	d- 2

25. Which of the following is <u>isoelectronic</u> with Ca^{+2} ?

a- S²⁻ b- Ca c-Al³⁺ d- K

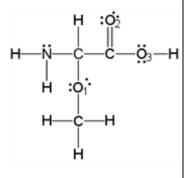
26- What is the molecular geometry and hybridization on oxygen atom O₁?

^{a-} Bent, sp³

b- Linear, sp³

c- Bent, sp

d- Linear, sp



a-1S	b llowing orbitals is <u>inc</u> b- 2P	c-2F	d- 4d
28- What is the <u>numbe</u> a- 4 π, 2 pair c- 3 π, 3 pair	<mark>r of π bond, and lone</mark> b- 2 π, 3 pair d- 5 π, 3 pair		his structure? HC=C-CH ₃ HOCH ₄ HOCH ₄
29- Which of the follow	-	es <u>not</u> apply to PF₃?	
a- has three σ bond			
b- contains polar bo	onds		
c- trigonal planar			
d- one lone pair of e	electrons on phosphor	us	
30 . The <u>electronic confi</u> a- [Ne]4s ²	i <mark>guration</mark> of Vanadium b- [Ar]4s ²		d- [Ar]4s²3d³
31- Describe the <u>chang</u>	<u>e in hybridization (</u> if a	ny) of the Al atom in tl	nis reaction:
31- Describe the <u>chang</u> AlCl ₃ + Cl [−]		ny) of the Al atom in tl	nis reaction:
AICI₃ + CI⁻			nis reaction: d- sp→sp³
AlCl₃ + Cl ⁻ a- p→sp ²	\rightarrow AICl ₄ \rightarrow b- sp \rightarrow sp ²	c- sp²→sp³	
	\rightarrow AICl ₄ \rightarrow b- sp \rightarrow sp ²	c- sp²→sp³	
AlCl ₃ + Cl ⁻ a- $p \rightarrow sp^2$ 32- Which one of the fo	$b - sp \rightarrow sp^2$	c- sp²→sp³ ould be <u>linear</u> ?	d- sp→sp³
AlCl ₃ + Cl ⁻ a- $p \rightarrow sp^2$ 32- Which one of the fo	b- sp \rightarrow sp ² bllowing molecules sho b- H ₂ O	c- sp²→sp³ ould be <u>linear</u> ?	d- sp→sp³
AlCl ₃ + Cl ⁻ a- $p \rightarrow sp^2$ 32- Which one of the fo	b- sp \rightarrow sp ² bllowing molecules sho b- H ₂ O	c- sp ² →sp ³ ould be <u>linear</u> ? c- NH ₃	d- sp→sp³