

General Chem.101
First Exam

14

ح.ث.خ من 1 ← 2

سنة (4)

Date: 17/11/2013

Time: 60 min.

Name:

Reg. No.:

Instructor Name: Dr. Ehab

Seat No.:

$$N_A = 6.022 \times 10^{23} \text{ mol}^{-1}$$

For molar masses always use the provided periodic table

Answer sheet

1. a b ~~c~~ d e

9. a ~~b~~ c ~~d~~ e

2. a ~~b~~ ~~c~~ d e

10. ~~a~~ b c d e

3. a b c d ~~e~~

11. a b ~~c~~ d e

4. ~~a~~ b c d e

12. a b c d ~~e~~

5. ~~a~~ b c d e

13. a b c ~~d~~ e

6. a b ~~c~~ d e

14. a b c ~~d~~ e

7. a ~~b~~ c d e

15. a ~~b~~ c d e

8. a b c d ~~e~~

16. ~~a~~ b c d ~~e~~

الإجابة
الصحيحة

18

Lanthanum	57	La	138.91	Cerium	58	Ce	140.12	Praseodymium	59	Pr	140.91	Neodymium	60	Nd	144.24	Promethium	61	Pm	(145)	Samarium	62	Sm	150.36	Europium	63	Eu	151.97	Gadolinium	64	Gd	157.25	Terbium	65	Tb	158.93	Dysprosium	66	Dy	162.50	Holmium	67	Ho	164.93	Erbium	68	Er	167.26	Thulium	69	Tm	168.93	Ytterbium	70	Yb	173.04
Actinium	89	Ac	(227)	Thorium	90	Th	232.04	Protactinium	91	Pa	231.04	Uranium	92	U	238.03	Neptunium	93	Np	(237)	Plutonium	94	Pu	(244)	Americium	95	Am	(243)	Curium	96	Cm	(247)	Berkelium	97	Bk	(247)	Californium	98	Cf	(251)	Einsteinium	99	Es	(252)	Fermium	100	Fm	(257)	Mendelevium	101	Md	(258)	Nobelium	102	No	(259)

****actinides**

1) Which of the following is a chemical change?

- a) boiling of water b) melting wax c) Cooking a steak on a grill
d) condensing water vapor into rainfall e) cutting a piece of wood

2) Carry out the following arithmetic operation to the correct number of significant figures:

$3.125 \text{ g} \times \pi + 0.110 \text{ g}$
 π is a constant equals 3.14, exactly. $9.81 + 0.110 = 9.92$

- a) 9.9 g b) 9.922g c) 9.92 g d) 9.9225 g e) 9.92350 g

هاي المفرومن

3) One of the following is an extensive property?

- a) The density of a copper wire
b) The color of a homogeneous surface
c) The temperature of a homogeneous surface
d) The color of water surface
e) The mass of an element.

تزيدني الكمية
تزيد صفة او property

4) The nucleus of the parent atom has a mass number of 55. If the number of neutrons in the nucleus is 1.2 times that of the number of protons, what is the element?

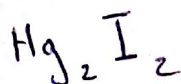
- a) Mn b) Cu c) Zn d) Cr e) Co
 25 29 30 24 27
 54.94 63.55 65.39 52 58.9

5) What is the name of $\text{Mn}(\text{HSO}_3)_2$?

- a) Manganese (II) hydrogen sulfite
b) Magnesium (II) hydrogen sulfate
c) Manganese (II) sulfate
d) Magnesium hydrogen sulfite
e) Magnesium hydrogen sulfate

Manganese (II)

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6) What is the formula of mercury(I) iodide?

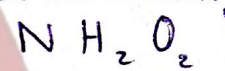
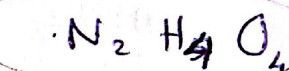
- a) HgI b) Hg₃I₃ **c) Hg₂I₂** d) HgI₂ e) IHg

7) Hydroxylamine nitrate contains 29.17 mass % N, 4.20 mass % H, and 66.63 mass % O. If its molar mass is between 94 and 98 g/mol, what is its molecular formula?

- a) NH₂O₅ **b) N₂H₄O₄** c) N₃H₃O₃ d) N₄H₈O₂ e) N₂H₂O₄

$$\frac{96}{48} = 2$$

	N	H	O
ms	29.17	4.2	66.63
M.wt	14	1	16
	2.08	4.2	4.16



$$\text{M.wt} = 48$$

8) How many grams of sodium fluoride are needed to form 485 g of sulfur tetrafluoride according to the following unbalanced chemical equation?



$$\begin{aligned} \text{S} &= 32.07 \\ \text{F} &= 19 \\ \text{Na} &= 23 \end{aligned}$$

- a) 51.3 g b) 205 g c) 1940 g d) 1510 g **e) 754 g**



$$\text{ms} = ??$$

$$\text{ms} = 485 \text{ g}$$

$$\text{M.wt} =$$

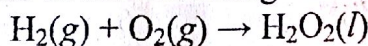
$$\text{M.wt} = 108.07$$

$$n = 4.487$$

$$n = 17.951$$

$$\text{ms} = 753.942$$

9) A mixture of 32.0 g of oxygen and 16.0 g of hydrogen is allowed to react to produce H₂O₂. What is the mass of the remaining amount of the excess reactant?



a) 4.0 g

b) 8.0

c) 13.0 g

d) 14.0 g

e) 15.0 g



$$32 \times 100\% = 94$$

$$\frac{2 \times 16}{32} = 1$$

$$B = 10.81$$

$$H = 1$$

$$M.wt = 13.81$$

10) What is the number of hydrogen atoms in 1 g BH_3 ?

- a) 1.31×10^{23} b) 3.54×10^{22} c) 3.0×10^{22} d) 6.022×10^{23} e) 1.81×10^{24}

$$n = 0.072 \text{ mole}$$

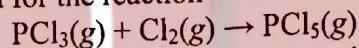
$$H \text{ عدد الذرات} = \text{عدد الجزيئات} \times \text{عدد الهيدروجين في الجزيء}$$

$$= 1.308 \times 10^{23}$$

$$\text{عدد الجزيئات} = n \times N_A$$

$$= 4.36 \times 10^{22}$$

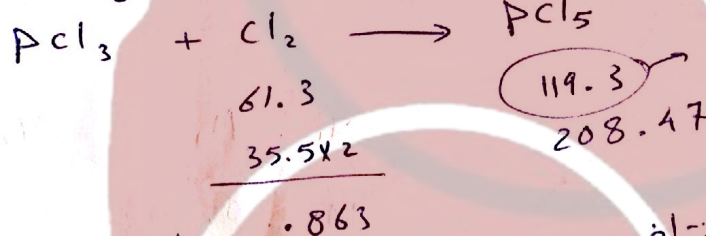
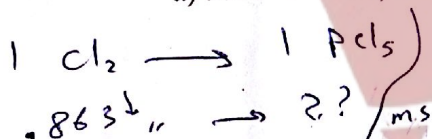
11) What is the percent yield for the reaction



if 119.3 g of PCl_5 are formed when 61.3 g of Cl_2 react with excess PCl_3 ?

$$p = 30.97$$

- a) 95% b) 85.0% c) 66.3% d) 51.4% e) 43.7%

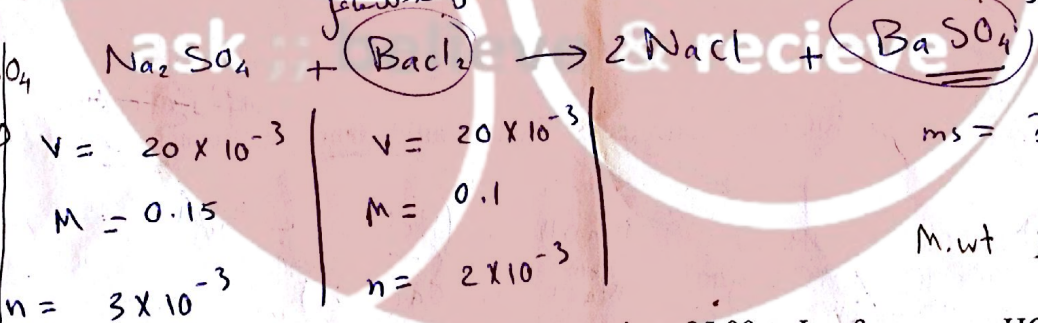
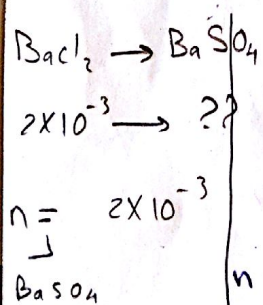


$$n = 0.863$$

$$\times M.wt$$

12) Calculate the mass of the precipitate results from mixing 20.0 mL of 0.150 M Na_2SO_4 solution and 20.0 mL of 0.100 M $BaCl_2$ solution.

- a) 0.117 b) 0.234 c) 0.175 d) 0.272 e) 0.47



$$ms = ??$$

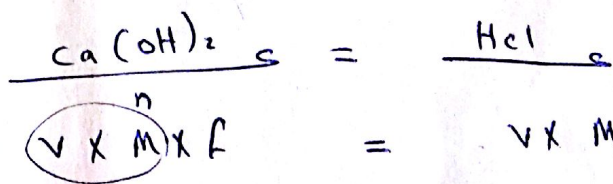
$$0.4668 \text{ g}$$

$$M.wt = 233.4$$

13) A 0.00100 mol sample of $Ca(OH)_2$ requires 25.00 mL of aqueous HCl for neutralization. What is the concentration of the HCl?

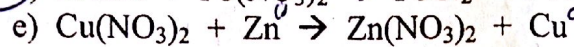
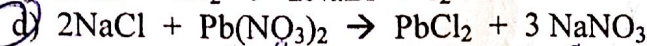
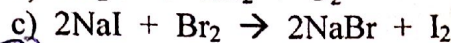
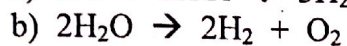
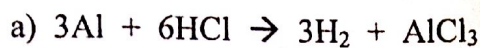
- a) 0.020 M b) 0.040 M c) 0.060 M d) 0.080 M e) 0.10 M

$$M = \frac{n}{V}$$



$$0.001 \times 2 = 25 \times 10^{-3} \times M$$

14) Which of these equations does not represent an oxidation-reduction reaction?



تبادل
مزدوج

15) A 10.00 mL sample of 0.203 M hydrochloric acid is introduced into a flask, and water is added until the volume of the solution reaches 250. mL. What is the concentration of nitric acid in the final solution?

a) 1.27 M

d) 3.25×10^{-2} M

Hydrochloric acid
HCl

b) 8.12×10^{-3} M

e) 5.08×10^{-4} M

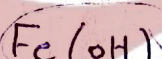
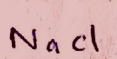
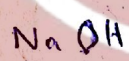
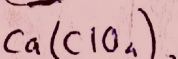
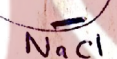
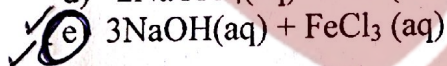
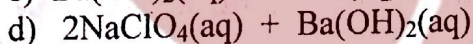
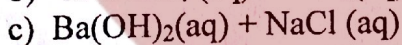
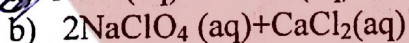
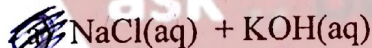
c) 0.406 M

$$V_1 \cdot M_1 = V_2 \cdot M_2$$

$$10 \times 0.203 = 250 \times M_2$$

$$M_2 = 8.12 \times 10^{-3}$$

16) Which of the following aqueous solutions would produce a precipitate upon mixing:



راسب

راسب

OH

un soluble

بر لوگانت مع R و Na
Soluble
بهر