

(CHEM 101 - CHEM 103)

FIRST SEMESTER

SECOND EXAM-I

(1438-1439H) (2017-2018G)

جامعة
الملك سعود
King Saud University



COLLEGE OF SCIENCE

Chemistry Department

Student's Name:	Write your answer in the table below			
	Q1:	Q6:	Q11:	
Student ID No.	Q2:	Q7:	Q12:	
Group No.	Q3:	Q8:	Q13:	
Saturday 14/03/1439H	10:30-12:00 pm	Q4:	Q9:	Q14:
Time allowed : 90 minutes	Q5:	Q10:	Q15:	

IA																	VIIIA
1	2											13	14	15	16	17	2
H	He											III A	IV A	V A	VIA	VII A	He
1.008	4.003											5	6	7	8	9	10
3	4											B	C	N	O	F	Ne
Li	Be											10.811	12.01	14.01	16.00	19.00	20.18
6.94	9.01											13	14	15	16	17	18
11	12	3	4	5	6	7	8	9	10	11	12	Al	Si	P	S	Cl	Ar
Na	Mg	III B	IV B	V B	VIB	VII B		VIII B		IB	IIB	26.98	28.09	30.97	32.07	35.45	39.98
23.00	24.31											31	32	33	34	35	36
19	20	21	22	23	24	25	26	27	28	29	30	Ga	Ge	As	Se	Br	Kr
K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	69.72	72.64	74.9216	78.96	79.90	83.80
39.09	40.08	44.96	47.87	50.94	52.00	54.94	55.85	58.93	58.69	63.546	65.41						
37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54
Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe
85.47	87.62	88.91	91.23	92.91	95.94	[98]	101.07	102.91	106.42	107.87	112.41	114.82	118.71	121.760	127.60	126.90	131.29
55	56	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86
Cs	Ba	Lu	Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi	Po	At	Rn
132.91	137.33	174.97	178.49	180.95	183.84	186.21	190.23	192.22	195.08	196.97	200.59	204.38	207.2	208.980	[209]	[210]	[222]
87	88	103	104	105	106	107	108	109	110	111	112	113					
Fr	Ra	Lr	Rf	Db	Sg	Bh	Hs	Mt	Ds	Rg	Uub	Uut					
[223]	[226]	[262]	[261]	[262]	[266]	[264]	[269]	[268]	[271]	[272]	[285]	[286]					

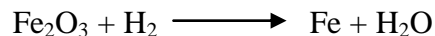
Constants:

$$1 \text{ atm} = 760 \text{ torr} = 101.325 \text{ kPa}$$

$$R = 0.0821 \text{ atm L mol}^{-1} \text{ K}^{-1}$$

$$N_A (\text{Avogadro's Number}) = 6.022 \times 10^{23} \text{ mol}^{-1}$$

Q1: When the following equation is balanced:



the coefficient of H_2 , is:

- A) 5
- B) 4
- C) 3
- D) 2
- E) 1

Q2: The mass (in g) of "O" present in 5.0 g of " $\text{K}_2\text{Cr}_2\text{O}_7$ ", is:

- A) 1.9
- B) 1.1
- C) 0.5
- D) 2.4
- E) 2.9

Q3: The percentage by mass of "Pt" in [$\text{C}_6\text{H}_{12}\text{N}_2\text{O}_4\text{Pt}$], is:

- A) 33.24 %
- B) 21.78 %
- C) 61.89 %
- D) 15.44 %
- E) 52.55 %

Q4: The number of calcium atoms "Ca" present in 0.5 g of " $\text{Ca}_2\text{P}_2\text{O}_7$ ", is:

- A) 3.79×10^{23}
- B) 2.37×10^{21}
- C) 3.11×10^{22}
- D) 4.51×10^{22}
- E) 4.26×10^{21}

Q5: A compound contains 63.68% C, 12.38% N, 9.80% H, and 14.14% O by mass. The empirical formula of this compound is:

- A) $\text{C}_2\text{H}_8\text{N}_2\text{O}$
- B) $\text{C}_8\text{H}_{15}\text{NO}$
- C) $\text{C}_6\text{H}_{11}\text{NO}$
- D) $\text{C}_7\text{H}_{13}\text{NO}_2$
- E) $\text{C}_9\text{H}_{18}\text{N}_2\text{O}_3$

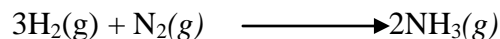
Q6: Given the following reaction:



If 25.5 g of " Fe_2O_3 " react with 3.3 g of "C", the mass (in g) of "Fe", is:

- A) 23.94
- B) 10.68
- C) 13.80
- D) 17.85
- E) 28.78

Q7: Given the following reaction:



If the reaction has a 88.7% yield, then the mass (in g) of H_2 needed to produce 120 g of " NH_3 " is:

- A) 24.01
- B) 18.09
- C) 13.67
- D) 27.42
- E) 36.87

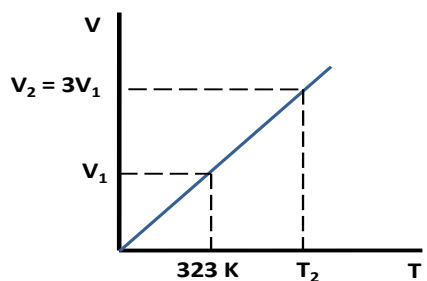
Q8: The molarity "M" (in mol.L^{-1}) of a solution prepared by dissolving 158.0 g of " $(\text{NH}_4)_2\text{SO}_4$ " in enough water to make 1250 mL solution, is:

- A) 1.63
- B) 1.24
- C) 0.29
- D) 0.48
- E) 0.96

Q9: At constant temperature, a sample of gas occupies 5.0 L at 0.98 atm. If the pressure becomes 3.25 atm, the gas volume (in mL) will be :

- A) 1252
- B) 1508
- C) 2186
- D) 2889
- E) 3896

Q10: The diagram below shows the change in volume (V) with temperature (T) of an ideal gas at constant pressure (P) and number of mole (n):



The final temperature (in °C) is:

- A) 969
- B) 742
- C) 498
- D) 696
- E) 415

Q11: The density (in g/L) of "CO₂" gas at -78 °C and 0.98 atm, is:

- A) 2.70
- B) 1.98
- C) 1.25
- D) 2.38
- E) 3.11

Q12: The volume (in L) of 2.41×10^{24} "NO₂" molecules at STP, is:

- A) 66.3
- B) 22.4
- C) 11.5
- D) 49.3
- E) 89.7

Q13: A 1.995 g of an ideal gas occupies 1.0 L at 20 °C and 1.5 atm. The molar mass (in g.mol⁻¹), is:

- A) 16
- B) 46
- C) 32
- D) 40
- E) 54

Q14: A sample of gas mixture at 750 torr contains 70.0 g of "He" and 30.0 g of "Ar". The partial pressures (in torr) of "He" gas is:

- A) 31
- B) 719
- C) 375
- D) 525
- E) 225

Q15: A gas sample has a pressure of 1.2 atm at 25°C. If the temperature changes to -23 °C, the final pressure (in atm) of gas, is:

- A) 0.75
- B) 1.75
- C) 1.50
- D) 1.00
- E) 0.50

