جامعة
الملك سعود
King Saud University
1957

COLLEGE OF SCIENCE
Chemistry Department

الاسم:	Write your answer in the table below			
....	Q1:	Q6:	Q11:	Q16:
الرقم الجامعي:	Q2:	Q7:	Q12:	Q17:
رقم الشعبة:	Q3:	Q8:	Q13:	Q18:
Monday 16/03/1442 H **07:00-09:00 PM**	Q4:	Q9:	Q14:	Q19:
Time allowed: **120 minutes**	Q5:	Q10:	Q15:	Q20:

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

Constant:

N_A (*Avogadro's Number*) = 6.02 x 10^{23}

1) How many mm^3 equal one nm^3?
A) 10^{-6}
B) 10^{-12}
C) 10^{-3}
D) 10^{-18}

2) A piece of metal with a mass of 0.5 g has a volume of 0.142 cm^3. What is the density (in g/cm^3)?
A) 3.1
B) 2.9
C) 3.5
D) 3.8

3) A sample contains two substances and has uniform properties. The sample is:
A) An element
B) A compound
C) a homogeneous mixture
D) a heterogeneous mixture

4) How many neutrons and electrons are in the ^{24}Mg?
A) 24 neutrons, and 24 electrons
B) 12 neutrons, and 12 electrons
C) 12 neutrons, and 24 electrons
D) 24 neutrons, and 12 electrons

5) What is the name of $Fe_3(PO_4)_2$?

A) Iron (II) phosphate
B) Iron (III) phosphate
C) Iron (II) phosphite
D) Iron (III) phosphite

6) Which of the following is a polyatomic cation?

A) Br^-
B) K^+
C) NH_4^+
D) NO_3^-

7) What is the chemical formula for magnesium sulfate heptahydrate?
A) $MgSO_3.7H_2O$
B) $MgSO_4.7H_2O$
C) $Mg_2SO_4.7H_2O$
D) $Mg(SO_4)_2.7H_2O$

8) What is the atomic weight of an element consisting of two isotopes, one with mass = 64.23 amu (26.0%), and one with mass = 65.32 amu?
A) 64.04
B) 64.09
C) 65.03
D) 65.09

9) How many sub-shells are in n=3?
A) 1
B) 2
C) 3
D) 4

10) Which of the following electron configurations is correct for Fe?
A) $[Ar]4s^23d^6$
B) $[Kr]4s^13d^6$
C) $[Ar]4s^13d^7$
D) $[Kr]4s^14d^7$

11) Four electrons in an atom have the quantum number given below. Which electron is at the lowest energy?

A) $n = 4$, $l = 2$, $m_l = -1$, $m_s = -\frac{1}{2}$
B) $n = 5$, $l = 1$, $m_l = 0$, $m_s = +\frac{1}{2}$
C) $n = 5$, $l = 0$, $m_l = 0$, $m_s = -\frac{1}{2}$
D) $n = 4$, $l = 0$, $m_l = 0$, $m_s = +\frac{1}{2}$

12) What is the correct order for first ionization energies?

A) $Cl > S > Al > Ar > Si$
B) $Ar > Cl > S > Si > Al$
C) $Al > Si > S > Cl > Ar$
D) $Cl > S > Al > Si > Ar$

13) Which one of the following atoms has the largest radius?
A) O
B) F
C) S
D) Cl

14) Which is the group that has a ns^2np^5 electron configuration in their valence shell?
A) 2A
B) 5A
C) 7A
D) 7B

15) Which statement is **false** for the balanced equation given below?

$2C_2H_6 + 7O_2 \rightarrow 4CO_2 + 6H_2O$

A) The reaction of 30 g of C_2H_6 will produce three moles of H_2O
B) The reaction of 56 g of O_2 will produce 44 g of CO_2
C) Two molecules of C_2H_6 requires seven molecules of O_2
D) One mole of C_2H_6 will produce four moles of CO_2

16) Copper and sulfur react to form CuS. A 3.0 g sample of copper is reacted with 2.0 g of sulfur. Calculate unreacted mass of excess reactant.

A) 0.96 g Cu
B) 0.12 g S
C) 0.52 g Cu
D) 0.49 g S

17) A compound has the following percentage composition by mass: C = 55.6%, H = 4.38%, Cl = 30.8% and O = 9.26%. What is the empirical formula?

A) $C_{16}H_{15}Cl_3O_3$
B) $C_{15}H_{15}Cl_3O_3$
C) $C_{20}H_{20}Cl_2O_2$
D) $C_{16}H_{15}Cl_3O_2$

18) Which of the following contains the largest mass of carbon atoms?

A) 1.1 moles $C_4H_7F_3$
B) 1.5 moles $C_3H_5N_3$
C) 3.0 moles $C_4H_8F_2$
D) 3.5 moles $C_3H_6F_2$

19) A compound contains one nitrogen atom with a percent composition of 4.62%. What is the molecular weight of this compound?

A) 300
B) 308
C) 312
D) 303

20) A compound has the molecular formula $C_{13}H_6Cl_6O_2$ (molar mass = 407 g mol^{-1}). How many moles of chlorine atoms are in 5.0 g this compound?

A) 0.012
B) 0.073
C) 0.360
D) 0.460