CHERCHER SECONDARY SCHOOL
CHEMISTRY MODEL EXAM FOR GRADE 12, 2016 E.C.
NUMBER OF QUESTIONS: 80 **TIME ALLOWED: 2:30**

PHYSICAL CONSTANT AND CONVERSION FACTORS

Avogadro's number $N_A = 6.02 \times 10^{23}$ Mol^{-1}, Mass of electron = 9.11×10^{-31}kg,
Velocity of light = 3.0×10^{8} m/s, Rydberg's constant $R_h = 2.18 \times 10^{-18}$J,
Planks constant = 6.626×10^{-34}J.s, Faradays constant, F = 96500 C
Universal gas constant R = 8.314 J/mol.K = 0.0821L.atm/Mol.K
$1\ A^0 = 10^{-10}$m, 1 L.atm = 101.3J

DIRECTION : THIS EXAMINATION CONTAINS A TOTAL OF 80 MULTIPLE CHOICE QUESTIONS. CHOOSE THE CORRECT ANSWER AMONG THE GIVEN ALTERNATIVES AND BLACKEN THE LETTER OF YOUR CHOICE ON THE SEPARATE ANSWER SHEET PROVIDED.

1. $^{56}_{26}Fe^{2+}$ ion has?
A. 26 proton, 28 neutron & 24 electron **C.** 24 proton, 28 neutron & 26 electron
B. 26 proton, 30 neutron & 26 electron **D.** 26 proton, 24 neutron & 28 electron

2. Which one of the following activities is used to reduce pollution?
A. Burning the waste deep in the ground
B. Burning the waste material in an open air away from the town
C. Releasing the wastes in the space at high altitude
D. recycling industrial and agricultural wastes

3. Which of the following describes the process of eutrophication?
A. Sudden increase in water temperature due to global warming
B. The enrichment of water bodies with nutrients, leading to excessive plant growth and oxygen depletion
C. The release of toxic chemicals into aquatic ecosystems, causing mass mortality of aquatic organisms
D. The migration of fish populations due to changes in ocean currents

4. Which of the following methods can be used to prepare alkynes in the laboratory?
A. Dehydrohalogenation of vicinal dihalides with an acid such as HCl or H_2SO_4
B. Alkylation reaction of sodium acetylide with a primary alkyl halide
C. Hydrogenation of alkenes with a metal catalyst
D. Dehydration of primary alcohols.

5. The properties of cathode rays do not depend on the nature of the gas in the discharge tube or on the material of the cathode. This indicates that?
A. Cathode rays move in straight line **C.** Cathode rays are a particle nature
B. Cathode rays are present in the atom of all elements **D.** Cathode rays are negatively charged

6. Which of the following are the correct steps for the production of sugar?
A. Harvesting → juicing → cleansing → evaporation → clarifying → crystallization
B. Harvesting → cleansing → juicing → clarifying → evaporation → crystallization
C. Harvesting → clarifying → juicing → evaporation → cleansing → crystallization
D. Cleansing → harvesting → juicing → clarifying → evaporation → crystallization

7. When dilute hydrochloric acid was added to unknown substance a gas that turned lime water to milky was produced. The unknown substance is.
A. Sulphate **B.** Nitrate **C.** Carbonate **D.** phosphate

8. 36 g sample of pipe water and 36 g sample of rain water were purified and subjected to electric current separately, both samples of water released 4g Hydrogen and 32g Oxygen after the electrolysis was accomplished. This finding confirms:
A. The law of conservation of mass **C.** The law of constant composition
B. The law of multiple proportion **D.** The law of mass action

9. One of the following salts is an acidic salt. Which one is it?
A. Zn(OH)Cl **B.** $Ca(NO_3)_2$ **C.** Na_2SO_4 **D.** KH_2PO_4

10. If the rate of diffusion of O_2 in to N_2 is 2.3 times the rates of diffusion of X in to N_2, What will be the relative molecular mass of X?

A. 148 **B.** 169 **C.** 64 **D.** 36

11. At constant pressure, the volume of a certain gas is 2 ml. what was the initial temperature to increase the volume by 1 ml at 27 ℃?

A. 200 K **B.** 28 K **C.** -27 K **D.** 372 K

12. Which conclusion was a direct result of the gold foil experiment?

A. An atom is mostly empty space with a dense, positively charged nucleus
B. An atom is composed of at least three types of subatomic particles
C. An electron has a positive charge and is located inside the nucleus
D. An electron has properties of both waves and particles

13. Given the table below that shows student's examples of proposed models of the atom:

Proposed models of the Atom

Model	Location of Protons	Location of Electrons
A	in the nucleus	specific shells
B	in the nucleus	regions of most probable location
C	dispersed throughout the atom	specific shells
D	dispersed throughout the atom	regions of most probable location

Which model correctly describes the locations of protons and electrons in the wave-mechanical model of the atom?

A. C **B.** D **C.** A **D.** B

14. Which one of the following configurations for the electrons in P-orbital of carbon atom satisfies Hund's rule?

A. ↑↓ ❑ ❑ **B.** ↑ ↓ ↓ ↓ **C.** ↑ ↑ ↑ **D.** ↑ ↑ ❑

15. When the following reaction is correctly balanced, what would be the coefficient of HNO_3?

$$Cu + HNO_3 \rightarrow Cu(NO_3)_2 + NO + H_2O$$

A. 4 **B.** 6 **C.** 8 **D.** 10

16. Ionic compound is formed between the elements that has:

A. High ionization energy and high electron affinity
B. high ionization energy and low electron affinity
C. Low ionization energy and high electron affinity
D. Low ionization energy and Low electron affinity

17. For the electrochemical cell represented by: $Zn(s)/ZnSO_4(aq)$ // $CuSO_4(aq)/Cu(s)$. The standard reduction potentials for Cu^{2+}/Cu and Zn^{2+}/Zn are **+**0.34 V and **-**0.76 V, respectively. What will be the cell reaction that occurs spontaneously and its cell voltage?

A. $Cu + Zn^{2+} \rightarrow Cu^{2+} + Zn$ E° = 1.10 V
B. $Zn + Cu^{2+} \rightarrow Zn^{2+} + Cu$ E° = 0.42 V
C. $Cu^{2+} + Zn^{2+} \rightarrow Zn + Cu$ E° = 0.42 V
D. $Cu^{2+} + Zn \rightarrow Cu + Zn^{2+}$ E° = 1.10 V

18. In an oxidation- reduction reaction, the oxidizing agent is?

A. reduced as it gains electrons
B. oxidized as it loses electrons
C. contains an element that undergoes oxidation
D. brings about reduction but itself oxidized

19. Consider the following chemical reaction:

I. $C_2H_4 + H_2O \rightarrow C_2H_5OH$
II. $C_6H_{12}O_6 \xrightarrow{yeast} 2C_2H_5OH + 2CO_2$
III. $C_2H_5OH \xrightarrow{H_2SO_4} CH_2 = CH_2 + H_2O$

Which one is the correct increasing order of atom economy of the given reactions?

A. I < II < III **B.** II < III < I **C.** III < II < I **D.** III < I < II

20. 64g of sulphur dioxide is burned in air to produce sulphur trioxide, SO_3. If the percentage yield of SO_3 is 90%, what is the actual yield of SO_3?
A. 80g **B.** 72g **C.** 57.6g **D.** 160g

21. Which of the following salts is given to people who suffer from anaemia?
A. KNO_3 **B.** $CuSO_4$ **C.** $FeSO_4$ **D.** $MgSO_4$

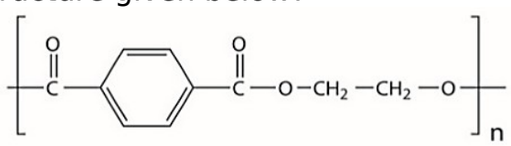
22. A petroleum product commonly used as furnace fuel is?
A. gasoline **B.** kerosene **C.** diesel oil **D.** petroleum ether

23. An alcohol that yield ketones on oxidation are classified as?
A. Dihydric alcohol **B.** primary alcohol **C.** Trihydric alcohol **D.** secondary alcohol

24. an oxide in which the two oxygen atoms are linked to each other by "-O-O- "link and with atoms of other element is known as?
A. a basic oxides **B.** an acidic oxide **C.** a peroxides **D.** an amphoteric oxides

25. 0.32 g of an ideal gas occupies 0.40 L at **-**29 c^o and 380 mmHg. What is the molar mass of the gas?
A. 28 g/mol **B.** 24 g/mol **C.** 32 g/mol **D.** 64 g/mol

26. What is the name of the structure given below?



A. Dacron **B.** Nylon 66 **C.** hexamethylenediamine **D.** Terephthalic acid

27. Elements whose outer most shell electrons fall in the f- orbital are called?
A. Transition elements **B.** Metallic elements **C.** Rare-earth metals **D.** Alkaline earth metals

28. The quantity of heat required to convert one mole of a solid into its liquid state is?
A. Molar heat of condensation **C.** Molar heat of crystallization
B. Molar heat of fusion **D.** Molar heat of sublimation

29. The difference between a galvanic and electrolytic cell is that, unlike the electrolytic cell the galvanic cell?
A. is used in the production of metal from their ores **C.** uses electrical energy to bring about a chemical change
B. is used in electroplating process **D.** has a spontaneous redox reaction

30. Hydrogen peroxide and chlorine can undergo bleaching by oxidation. The reactions involved are shown below ([dye + O] is a colorless substance):

$$H_2O_2 + \text{dye} \rightarrow [\text{dye} + O] + H_2O$$
$$Cl_2 + H_2O + \text{dye} \rightarrow [\text{dye} + O] + 2HCl$$

According to the principles of green chemistry, hydrogen peroxide is said to be a greener bleaching agent because:
A. Hydrogen peroxide is a stronger oxidizing agent than chlorine.
B. no water is required for hydrogen peroxide bleaching.
C. no toxic substance forms in hydrogen peroxide bleaching.
D. Excess hydrogen peroxide can be washed away easily.

31. The hydrocarbon that is widely used for cutting and welding of metals has the formula?
A. C_2H_6 **B.** C_3H_4 **C.** C_2H_2 **D.** CH_4

32. At what temperature in Kelvin scale would the temperature reading in Celsius is identical to the reading in degree Fahrenheit.
A. 37 K **B.** 10 K **C.** 273 K **D.** 233 K

33. Which of the following reaction is an elimination reaction?
A. $CH_3CH_3 + \frac{7}{2}O_2 \rightarrow 2CO_2 + 3H_2O$ **C.** $CH_3CH_2{=}CH_2 \xrightarrow{400-600\,^\circ C} CH_2 = CH_2 + CH_4$

B. $CH_4 + Br_2 \xrightarrow{UV} CH_3Br + HBr$ **D.** $CH_3CH = CH_2 + H_2 \xrightarrow{UV} CH_3CH_2CH_3$

34. An element 'Y' exists in two isotopic forms that is ^{100}Y and ^{110}Y, if the average atomic mass of element 'Y' is 108, what is the percentage abundance of each isotope respectively?

A. 40% & 60% **B.** 30% & 70% **C.** 20% & 80% **D.** 50% & 50%

35. Which of the following is an effect of acid rain?

A. Spreading water born disease **C.** Damage of the brain, kidney and liver

B. Accelerating the corrosion of metals **D.** Depletion of ozone layer

36. One of the following discoveries of sub-atomic particles is not relevant?

A. Robert Millikan – oil drop experiment **C.** James chad wick – nucleus

B. J.J Thomson – charge - to - mass ratio **D.** Rutherford – positively charge particle

37. How many moles are there in 159 g of Alanine, $C_3H_7NO_2$?

A. 0.560 **B.** 0.992 **C.** 1.78 **D.** 3.31

38. What is the magnitude of quantum energy and the frequency for an object whose wavelength is 0.6×10^{-6} m, respectively?

A. 3.31×10^{-19} J, 5×10^{14} s^{-1} **C.** 3.98×10^{-40} J, 2×10^{-15} s^{-1}

B. 1.99×10^{-25} J, 3.98×10^{-40} s^{-1} **D.** 9.94×10^{-12} J, 1.99×10^{-25} s^{-1}

39. The radii of the atoms become smaller from sodium to chlorine across period three. This is primarily due to?

A. the shielding effect **C.** Decreased metallic character.

B. The increased number of electrons. **D.** Increased nuclear charge.

40. Which of the following statements is **NOT** correct about quantum mechanical models?

A. The energy and position of an electron cannot be determined simultaneously.

B. Higher energy orbitals filled with electrons before lower energy orbitals.

C. When filling degenerate orbital (orbitals of equal energy), each orbital will occupy single electron before receives a second electron.

D. No two electrons can have the same four quantum numbers.

41. Given the reaction at equilibrium: $X_2(g) + 2Y_2(g)B \rightleftharpoons 2XY_{2(g)}$ + heat.
How the equilibrium reaction does yields high amount of product?

A. By increasing both the temperature and pressure

B. By decreasing the temperature and increasing pressure

C. By increasing the temperature and decreasing pressure

D. By decreasing both the temperature and pressure

42. The structure of the copolymer formed from $HO–CH_2\,CH_2–OH$ and $HOOC–CH_2\,CH_2–COOH$ is

A. $HO\text{-}[\text{-}O\text{-}CH_2CH_2\text{-}OOC\text{-}CH_2CH_2CO\text{-}]_n\,H$ C. $H\text{-}[\text{-}O\text{-}CH_2CH_2\text{-}OOC\text{-}CH_2\text{-}CH_2CO\text{-}]_n\,OH$

B. $H\text{-}[\text{-}O\text{-}CH_2CH_2OOC\text{-}CH_2\text{-}CH_2CO\text{-}]_n\,H$ D. $HO\text{-}[\text{-}O\text{-}CH_2CH_2OOC\text{-}CH_2\text{-}CH_2CO\text{-}]_n\,OH$

43. An atom containing two electrons with: $n = 3$, $\iota = 1$, $m_l = 1$, $m_s = -½$ and $n = 3$, $\iota = 1$, $m_l = 1$, $m_s = -½$ **may not exist** based on?

A. Hund's rule **C.** Pauli exclusion principle

B. Heisenberg's uncertainty principle **D.** Building up principle

44. Which of the following correctly lists electromagnetic waves in order from shortest to longest wavelength?

A. gamma rays, ultraviolet, infrared, microwaves

B. radio waves, infrared, gamma rays, ultraviolet

C. microwaves, ultraviolet, visible light, gamma rays

D. gamma rays, infrared, ultraviolet, microwaves

45. Which one of the following is a tertiary alcohol?

A. 3 – Hexanol **B.** 1, 2, 3 – Propanetriol **C.** 3 – methyl – 2 - pentanol **D.** 2 – methyl – 2 - Propanol

46. Which one of the following statements is **NOT** accepted in modern atomic theory?

A. An atom is divisible into electrons, protons and neutrons
B. Atoms of two or more elements combine in simple whole number ratios to from compounds
C. Atoms of different elements have different chemical properties
D. all atom of a given element are identical in mass

47. Which of the following is the purest form of iron?
A. Cast iron **B.** Pig iron **C.** wrought iron **D.** steel

48. Ethyne decolorize Br_2 in CCl_4. This is due to the formation of:
A. 1, 2 – dibromo ethane
B. 1, 1 – dibromo ethane
C. 1, 1, 2, 2 – tetrabromo ethene
D. 1, 1, 2, 2 – tetrabromo ethane

49. Among the following methods the one that can be used to prepare alkanes in the laboratory.
A. Dehydration of alcohols with concentrated H_2SO_4
B. Hydrogenation of alkene with a metal catalyst.
C. Dehydrohalogenation of alkyl halides with a base
D. Dehydrohalogenation of Vicinal dihalides with a base.

50. The carbon atoms in ethane (C_2H_6), ethene (C_2H_4) and ethyne (C_2H_2) provided, respectively, Examples of the three common types of hybridization corresponds to
A. sp, sp^2, sp^3 **B.** sp^3, sp^2, sp **C.** sp, sp^3, sp^2 **D.** sp^3, sp, sp^2

51. The highest quality steel is produced by using?
A. Open-hearth process **B.** Bessemer process **C.** Contact process **D.** Basic oxygen process

52. The equilibrium constants for each of the following reactions are given:

$N_2\ (g) + O_2\ (g) \rightarrow 2NO\ (g), \quad K_{c1} = 4.3 \times 10^{-25}$

$2NO\ (g) + O_2\ (g) \rightarrow 2NO_2\ (g), \quad K_{c2} = 6.4 \times 10^{9}$

What is Kc for the combined reaction? $N_2\ (g) + 2O_2\ (g) \rightarrow 2NO_2\ (g)$
A. 3.7×10^{-13} **B.** 6.1×10^{-14} **C.** 2.8×10^{-15} **D.** 8.9×10^{-16}

53. According to the collision theory, all collisions do not lead to reaction. Which choice gives both reasons why not all collisions between reactant molecules lead to reaction?
I. The total energy of two colliding molecules is less than some minimum amount of energy.
II. Molecules cannot react with each other unless a catalyst is present.
III. Molecules that are improperly oriented during collision will not react.
IV. Solids cannot react with gases.
A. I and II **B.** I and III **C.** I and IV **D.** II and III

54. The reaction between NO and I_2 is second order in NO and first order in I_2. What change occurs in the rate of the reaction if the concentration of NO is doubled and I_2 left unchanged?
A. doubled **B.** quadrupled **C.** eight times **D.** three times

55. The equilibrium partial pressures of SO_2, O_2 and SO_3 are 0.1atm, 0.25atm and 0.5atm respectively. The equilibrium constant for the reaction: $SO_3\ (g) \rightleftarrows SO_2\ (g) + 1/2O_2\ (g)$ is:
A. 0.05 **B.** 20 **C.** 0.1 **D.** 10

56. What are the bond orders of H_2, H_2^+, and H_2^-, based on molecular orbital theory, respectively?
A. 1, 0, and 0 **B.** 1, ½, and 0 **C.** 1, 0, and ½ **D.** 1, ½, and ½

57. Which one of the following reactions undergoes in the lithosphere?
A. $6CO_2 + 6H_2O \xrightarrow{Sunlight} C_6H_{12}O_6 + 6O_2$
B. $CF_2Cl_2 + UV \rightarrow CF_2Cl\cdot + Cl\cdot$
C. $Fe_2O_3 + 3H_2O \rightarrow Fe_2O_3.3H_2O$
D. $C_6H_{12}O_6 + 6O_2 \rightarrow 6CO_2 + 6H_2O$ + Heat energy

58. What is the relationship between Kc and Kp for the reaction: $3A(g) \rightleftharpoons B(g) + C(g)$
A. $Kp = Kc(RT)^{-1}$ **B.** $Kp = Kc(RT)^{1}$ **C.** $Kp = Kc(RT)^{-2}$ **D.** $Kp = Kc(RT)^{2}$

59. Among the traditional method of food preservation the one that inhibits growth or kills bacteria and other micro–organisms using brine or vinegar is?

A. Sugaring **B.** Smoking **C.** Pickling **D.** Canning

60. Which of the following general formula is representing ester?

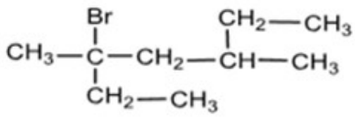
A. R-COOH **B.** R-COO-R' **C.** RCOR' **D.** ROR'

61. What is the monomer of Nylon 66?

A. Urea and formaldehyde **C.** adipic acid, ethylene glycol

B. terephthalic acid, ethylene glycol **D.** adipic acid, hexamethylenediamine

62. What is the correct IUPAC name of the compound shown below?



A. 3 – bromo – 3, 5 – dimethyl heptane **C.** 2 – bromo – 2 – ethyl -4-methyl hexane

B. 2 – bromo – 2, 4 – diethyl pentane **D.** 3 – bromo – 5 – ethyl -3-methyl hexane

63. Which one of the following is not the most important chemical groups of herbicides?

A. Chlorophenoxy acids such as 2, 4-D **C.** Amides such as alachlor and metolachlor

B. Malathion **D.** Organic phosphorus chemicals such as glyphosate

64. A student determined the density of an acid to be 3.91, 3.90, and 3.93 g cm^{-3}. If the actual density of the solid is 2.76 g cm^{-3}, how should the student's result be described?

A. Low accuracy and low precision **C.** Low accuracy and high precision

B. High accuracy and low precision **D.** High accuracy and high precision

65. Which of the following describes a part of the contact process?

A. H_2S is burned in air to produce SO_2

B. SO_3 is absorbed in distilled water, then reacts with water to give H_2SO_4

C. SO_2 is absorbed in distilled water to give H_2SO_3

D. Converting SO_2 to SO_3 in the presence of V_2O_5

66. Which region of the electromagnetic spectrum is capable of inducing electron transitions with the greatest energy?

A. Infrared **B.** Ultraviolet **C.** Microwave **D.** Visible

67. What is the E° for an electrochemical cell with the following cell reaction?

Au^{3+}/Au, E° = +1.50V Co^{2+}/Co, E° = **-**0.28V over all reaction: $2Au^{3+} + 3Co \rightarrow 3Co^{2+} + 2Au$

A. -1.22 V **B.** 1.78 V **C.** 1.22 V **D.** 3.84

68. Carboxylic acids containing two carboxyl groups in their structure are called?

A. di carboxylic acids **B.** aromatic carboxylic acids **C.** tri carboxylic acids **D.** mono carboxylic acids

69. Which one is conjugate acid-base pair in the following reaction?

$HSO_4^- + SO_3^{2-} \rightleftharpoons HSO_3^- + SO_4^{2-}$

A. HSO_3^-**,** SO_3^{2-} **B.** HSO_3^-**,** SO_4^{2-} **C.** HSO_4^-**,** HSO_3^- **D.** HSO_4^-**,** SO_3^{2-}

70. If a certain first order reaction has a half-life of 20 seconds. What is the rate constant for this reaction?

$A.10s^{-1}B.0.35s^{-1}C.40\,s^{-1}D.0.035s^{-1}$

71. What is the half-life, $t_{\frac{1}{2}}$ for a zero order reaction: A → B? (where K is rate constant)

A. Ln 2x **B.** Ln $K[A]_0$ **C.** $\frac{[A]0}{2K}$ **D.** Ln $2[A]_0$

72. Which of the following explains why I_2 is a solid, Br_2 is a liquid and Cl_2 is a gas, at room temperature?

A. Ionic bonding **B.** Hydrogen bonding **C.** Hybridization **D.** London dispersion forces

73. For the determination of the density of a new ceramic, a student measured the mass of a piece on an analytical balance and obtained 3.8056 gram and its volume 2.5 mL by

displacement of water in a graduated cylinder. The correct reported density of the ceramic should be?

A. 1.5224 g/Ml **B.** 3.5 g/mL **C.** 1.5222 g/mL **D.** 1.5 g/mL

74. One of the following has given pairs represents examples of buffer systems?

A. NH_4Cl/H_2O and H_2O/CH_3COONa **C.** NaOH/HCl and HNO_3/KOH

B. NH_4OH/NH_4Cl and CH_3COOH/CH_3COONa **D.** NH_4OH/CH_3COOH and NH_4Cl/CH_3COONa

75. How many grams of aluminum metal can be produced by the electrolysis of Al_2O_3 passing a current of 6 amperes for 96,500 sec through the cell?

A. 54 gm **B.** 0.02 gm **C.** 162 gm **D.** 0.67 gm

76. Identify the unknown oxides A, B, C, and D as acidic, basic, amphoteric or neutral based on the following experimental results.

Oxides	**Color of litmus in solution of the oxides**		**Reaction with an acid**	**Reaction with abase**
	Blue litmus	**Red litmus**		
A	Red	Red	No	Yes
B	Blue	Red	Yes	Yes
C	Blue	Blue	Yes	No
D	Blue	Red	No	No

What are the four (4) oxides respectively?

A. Acidic, Amphoteric, Basic, and Neutral **C.** Basic, Amphoteric, Acidic, and Neutral

B. Neutral, Basic, Amphoteric, and Acidic **D.** Amphoteric, Acidic, Basic, and Neutral

77. When the net ionic equations: $\mathbf{Fe^{2+} + Cr_2O_7^{2-} \rightarrow Cr^{3+} + Fe^{3+}}$ is balanced by ion electron method in acidic medium, what is the value of the coefficient of: $\mathbf{Fe^{2+}}$, $\mathbf{Cr_2O_7^{2-}}$, $\mathbf{Cr^{3+}}$, and $\mathbf{Fe^{3+}}$ respectively?

A. 1, 1, 2, and 1 **B.** 5, 1, 2, and 5 **C.** 3, 1, 2, and 3 **D.** 6, 1, 2, and 6

78. What is the oxidation number of chromium in the ionic compound ammonium dichromate, $(NH_4)_2Cr_2O_7$?

A. +3 **B.** +6 **C.** +4 **D.** +7

79. The rat eye possibly can view the light with a wave length of 380nm. What is the frequency of this light wave?

A. $1.17 \times 10^{20} s^{-1}$ **B.** $1.14 \times 10^{20} s^{-1}$ **C.** $7.9 \times 10^{14} s^{-1}$ **D.** $3.83 \times 10^{14} s^{-1}$

80. If 3 mole of Calcium reacted with 3 mole Oxygen according to the following unbalanced chemical equation, how many grams of CaO are formed? $Ca + O_2 \rightarrow CaO$ (Use at. Mass of Ca = 40 gm, O = 16 gm)

A. 56 gm **B.** 168 gm **C.** 336 gm **D.** 112 gm

~ The End ~