

# CENTRAL UNIVERSITY



OCTOBER RESIT EXAMINATION 2017

FACULTY OF ARTS AND SOCIAL SCIENCES

DEPARTMENT OF ENVIRONMENT & DEVELOPMENT STUDIES

ENDS 103: INTRODUCTORY CHEMISTRY

(2 CREDITS)

LEVEL 100

October 2017

DURATION: 2 HOURS

STUDENT ID No.....

## INSTRUCTIONS

**ANSWER ALL QUESTIONS IN SECTION A AND  
ANYTWOQUESTIONS FROM SECTION B.**

Start a major question on a new page. Please, write your index number clearly on each page. Clarity of expression and legibility of handwriting count.

**DO NOT TURN OVER THIS PAGE UNTIL YOU HAVE BEEN TOLD TO DO SO BY**

**THE INVIGILATOR**

LECTURER: DR. WILLIAM AHORTTOR

**Section A: Answer all Questions.**

1. The Stocks system of nomenclature should not be used for monovalent metals such as Na.

- (a) This True      (b) False      (c) Don't know

2. A covalent bond is normally formed between

- (a) a nonmetal and a nonmetal  
(b) a nonmetal and a metalloid  
(c) a metalloid and a metalloid  
(d) All the above

3. What are metalloids?

- (a) Metalloids have the appearance of metals but they are not metals  
(b) Metalloids are poor conductors of electricity and are generally semi-conductors.  
(c) Examples of Metalloids are Boron, Silicon, arsenic, germanium, antimony, polonium and tellurium  
(d) All the above.

4. A triple covalent bond is formed when.....electron pairs are shared.

- (a) 6      (b) 3      (c) 4      (d) 2

5. The order of inter-particles forces from the strongest to the weakest is

- (a) Hydrogen bonding, ionic bonding, covalent bonding  
(b) Ionic bonding, covalent bonding, hydrogen bonding  
(c) Covalent bonding, ionic bonding, hydrogen bonding  
(d) Covalent bonding, hydrogen bonding, ionic bonding.

6. What are the characteristics of isotopes?

(a) Isotopes have the same atomic number (same number of protons), but a different atomic mass number (a different number of neutrons).

(b) Isotopes have different atomic number (different number of protons), and different atomic mass number (a different number of neutrons).

(c) Isotopes behave the same chemically, because they are the same element.

(d) A and C only

7. What is the atomic number of an atom?

(a) The number its protons

(b) The number its electrons

(c) The number of its neutron

(d) The sum of its protons and neutrons

8. A particle with 6 protons and an atomic mass number of 14 has ..... neutrons.

(a) 6 neutrons (b) 8 neutrons (c) 12 neutrons (d) 10 neutrons

9.  $^{23}\text{Na}^{11}$  represents a sodium atom which always has 11 protons and in this case has a atomic mass number of 23. How many neutrons are there in the structure?

(a) 11 (b) 12 (c) 13 (d) 14

10. How many neutrons are there in the  $^{18}\text{O}$  ?

(a) 8 (b) 9 (c) 10 (d) 12

11. For second row elements the expected number of bonds the element can form is normally:

(a) Equals to the number of valence electrons

(b) Equals 8 minus the number of valence electrons

(c) Equals the number of unpaired electrons.

(d) Equals the lone electrons.

12. If for atoms having more than 3 valence electrons, total electrons – valence electrons = bonds. Determine the number of covalent bonds Al atom can form.

- (a) 1      (b) 2      (c) 3      (d) 4

13. In the structure  $\begin{array}{c} | \\ \text{---C:} \\ | \end{array}$  Determine the number of electrons “owned” by the Carbon atom.

- (a) 4      (b) 5      (c) 6      (d) 8

14. Isotopes of an atom have the same atomic number (same number of protons), but a different atomic mass number and hence different .....

- (a) number of Electrons      (b) number of Neutrons      (c) number protons  
(d) None of the above.

15. What differentiates a monovalent metal from a divalent metal?

- (a) Monovalent metals form only one type of ion  
(b) Monovalent metals always exhibit oxidation state of +1 in all compounds  
(c) Monovalent metals always exhibit oxidation state of +2 in all compounds  
(d) All monovalent metals have oxidation state less than +2

16. The oxidation number of the nonmetallic element in a binary ionic compound is always equal to the number of electrons that it needs to gain to become iso-electronic with a noble gas. This statement is

- (a) False      (b) True      (c) Both true and False      (d) Don't know

17. Bivalent Metals can have more than one oxidation number in a compound. Which of the metals below is not a bivalent metal?

- (a) Ca      (b) Cu      (c) Hg      (d) Fe

18. Which of the following ions is a polyatomic with a -2 charge?

- (a)  $\text{MnO}_4$       (b)  $\text{NO}_3$       (c)  $\text{SO}_4$       (d)  $\text{ClO}_3$

19. Binary molecular compounds contain either

- (a) Two different nonmetals
- (b) A metalloid and nonmetal
- (c) Two different metalloids
- (d) All the above

20. The inter-molecular forces in solids, liquids and gases increase in the following order:

- (a) Gaseous phase, solid phase, liquid phase
- (b) Solid phase, liquid phase, gaseous phase
- (c) Liquid phase, gaseous phase, solid phase
- (d) Gaseous phase, liquid phase, solid phase

**SECTION B: ANSWER TWO QUESTIONS FROM THIS SECTION**

1. (a) What is the Lewis Dot Structure?

(b) Provide 4 guidelines for writing the Lewis Dot Structure

(c) Write the Lewis Dot Structure for CO<sub>2</sub>

2. (a) What is the Stock System of Nomenclature used for?

(b) Using the Stock System, explain how you will name FeO and Fe<sub>2</sub>O<sub>3</sub>

9. (a) What is an atom?

(b) What is the difference between an atom and its subatomic particle?

(c) List all the sub-atomic particles of any atom.

10.(a) What are charged particles?

(b) Give 2 examples of charged particles and how they acquire their charges.

(c) Explain what you understand by ionic, covalent and metallic bonds and provide examples of each bond