

**END OF TERM III EXAMS 2018**

**S.3 CHEMISTRY 545/2**

**Paper 2**

**TIME: 2 HRS 30 MINS**

**INSTRUCTIONS**

This paper consists of section A,B and C

Both sections are compulsory

In section A, you choose the correct alternative either A,B,C or D.

Section B answers should be written in the spaces provided

Section C answers should be on the answer sheet provided.

**SECTION A**

1. Which one of the following methods is most suitable for preparing a pure dry sample of silver chloride?

- |                     |                                 |
|---------------------|---------------------------------|
| A. Direct synthesis | C. precipitation                |
| B. Neutralization   | D. reacting silver with an acid |

2. When heated strongly, lead(II) nitrate leaves a solid residue which is

- A. Reddish brown when hot and grey when cold
- B. Yellow when hot and white when cold
- C. Reddish brown when hot and white when cold

D.Reddish brown when hot and yellow when cold

3. The process of making steel from iron is known as

A. alloying

C. galvanizing

B. metal plating

D. glazing

4. The formula of the chloride of metal M is  $MCl_3$ . The formula of the sulphate of M is

A.  $MSO_4$

C.  $M_2(SO_4)_3$

B.  $M_2SO_4$

D.  $M_3(SO_4)_2$

5. When excess sulphur dioxide is passed through sodium hydroxide solution,the product formed is

A. sodium sulphate

C. sodium sulphate

B. sodium hydrogen sulphite  
sulphate

D. sodium hydrogen  
sulphate

6. Which of the following is formed when burning magnesium is passed through carbondioxide?

A. magnesium carbonate

C. carbonmonoxide

B. magnesium nitride

D. carbon

7. Which one of the following liquids is miscible with water?

A. ethanol

C. kerosene

B. methyl benzene

D. petrol

8. The following processes are involved in the carbon cycle except

- A. respiration
- B. combustion
- C. photosynthesis
- D. lightening

9. Which one of the following oxides is a mixed oxide?

- A.  $\text{ZnO}$
- B.  $\text{Al}_2\text{O}_3$
- C.  $\text{Na}_2\text{O}$
- D.  $\text{Fe}_3\text{O}_4$

10. When heated, ammonium nitrate produces

- A. nitrogen dioxide
- B. ammonia
- C. dinitrogen oxide
- D. nitrogen monoxide

11. The role of passing chlorine gas through water during its laboratory preparation is to

- A. remove chlorine gas
- B. Cool chlorine gas
- C. cool hydrogen chloride gas
- D. remove hydrogen chloride

12. Which one of the following best explains why graphite and diamond differ?

- A. Graphite is impure carbon
- B. Their densities are not the same

C. All the four valency electrons in graphite are used in covalent bonding

D. Their atomic structures are different

13. When lime water is exposed to air for sometime, a white solid is formed known as

A. calcium carbonate

C. calcium oxide

B. calcium hydroxide

D. calcium hydrogen carbonate

14. Increasing concentration, increases the rate of a reaction because the particles

A. move further

C. have more energy

B. collide more often

D. collide with more force

15. Most metals react with dilute mineral acids to form

A. hydrogen gas only

B. a salt of the metal and water

C. a salt of the metal only

D. a salt of the metal and hydrogen gas

16. The following nitrates decompose on heating to produce brown fumes except

A. copper(II) nitrate

C. sodium nitrate

B. lead (II) nitrate

D. silver nitrate

17. The property of ammonia demonstrated by the fountain experiment is its

- A. Readiness to react with water
- B. Very high solubility in water
- C. Being lighter than air
- D. Being denser than air

18. Solder is an alloy made of

- A. Zinc and aluminium
- B. Lead and tin
- C. Copper and lead
- D. Aluminium and copper

19. Excess steam reacts with iron to produce

- A.  $\text{Fe}_3\text{O}_4$
- B.  $\text{FeO}$
- C.  $\text{Fe}_2\text{O}_3$
- D.  $\text{Fe}_2\text{O}_3 \cdot n\text{H}_2\text{O}$

20. When dry air is passed through sodium hydroxide solution and then over heated copper metal, the residual gas consists of

- A. oxygen
- B. carbon dioxide
- C. water vapour
- D. nitrogen

### **SECTION B**

21a) zinc carbonate was strongly heated in a test tube until no further change.

i) State what was observed

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.....  
.....

ii) Write the equation for the reaction that took place

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b) The residue formed in (a) above was added to dilute Sulphuric acid and heated.

i) Write the equation for the reaction

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.....  
.....

ii) State what was observed

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.....  
.....

22a) Define allotropy

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b) Give the three allotropes of carbon

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 .....  
 .....  
 .....  
 .....

c) Give two examples of other elements which show allotropy and name their allotropes

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 .....  
 .....  
 .....

23. The number of electrons, protons and neutrons in atoms W,X,Y and Z are shown in the table below

| Atom | Electrons | Protons | Neutrons |
|------|-----------|---------|----------|
| W    | 8         | 8       | 8        |
| X    | 16        | 16      | 16       |
| Y    | 13        | 13      | 14       |
| Z    | A         | 3       | 4        |
|      |           |         |          |

a) Determine

i) The value of A

.....  
 ..

ii) The approximate atomic mass of Y

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.....  
.....

b) Write the electronic configuration of the following atoms and ions

- i. W.....
- ii.  $W^{2-}$  .....
- iii. Y.....
- iv.  $Y^{3+}$  .....

c) State the two atoms that are isotopes of the same elements

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.....

d) Write the formula of the compound formed between X and Y

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24a) Define the following terms

i) Strong acid

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ii) Weak acid

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b) Give two examples in case

Strong acids

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Weak acids

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### **SECTION C**

25a(i) Draw a labeled diagram of the setup of the apparatus that can be used to prepare a dry sample of carbon dioxide in the laboratory.

ii) Write an equation that leads to the formation of carbondioxide

iii) Write an ionic equation for the reaction leading to the formation of carbondioxide

b) carbondioxide was passed through calcium hydroxide solution. Describe and explain the reaction that took place

c) State what would be observed if burning magnesium ribbon was lowered into a jar of carbondioxide

ii) Write the equation for the reaction that takes place

26. Calculate the empirical formula of the following

a) Find the empirical formula of an oxide of magnesium consisting of 0.32 g of oxygen and 0.48g of magnesium(Mg=24, O=16)

b) An oxide of sulphur consist of 40% sulphur and 60% oxygen ( S=32, O=16)

END