FUKIEN SECONDARY SCHOOL
S3 First Term Uniform Test (2020-2021)
Chemistry
(45 minutes)

Date: 23rd October 2020 Name:___________________
Time: 9:45a.m. - 10:30a.m. Class: ________ No.:_______

Instructions to students:

1. Write your name, class and class number on both the question paper and the answer sheets.
2. Answer ALL questions.
3. Write down all the answers on the answer sheets.
4. Hand in the question paper and the answer sheets at the end of the examination.
5. The total mark of the paper is 70.

I. Multiple Choice Questions (20 marks)

1. Which of the following statements about metals and non-metals at room temperature and pressure is correct?
   A. All metals are solids.
   B. All non-metals are non-conductors of electricity.
   C. Non-metals are either gases or solids.
   D. All metals are conductors of electricity.

2. Which of the following substances is NOT an element?
   A. Diamond
   B. Glucose
   C. Oxygen
   D. Sodium

3. Which of the following elements is the BEST conductor of heat?
   A. Magnesium
   B. Hydrogen
   C. Nitrogen
   D. Sulphur

4. Which of the following statements about copper is correct?
   A. It is a poor conductor of heat.
   B. It has a shiny appearance.
   C. It is brittle.
   D. It has a low boiling point.

5. Which of the following statements about elements are correct?
   (1) Two or above elements chemically combine to form compounds.
   (2) An element is a substance which cannot be broken down into anything simpler by chemical methods.
   (3) Ammonia is an element.

   A. (1) and (2) only
   B. (1) and (3) only
   C. (2) and (3) only
   D. (1), (2) and (3)

6. Which of the following substances are good conductors of electricity?
   (1) Solid aluminium
   (2) Graphite
   (3) Molten sodium

   A. (1) and (2) only
   B. (1) and (3) only
   C. (2) and (3) only
   D. (1), (2) and (3)

7. Which of the following statements about oxygen are correct?
   (1) It is a colourless gas.
   (2) It is a non-metal.
   (3) The following hazard warning symbol should be displayed on a metal cylinder containing it.

   A. (1) and (2) only
   B. (1) and (3) only
   C. (2) and (3) only
   D. (1), (2) and (3)

8. Which of the following statements about the structure of an atom is correct?
   A. The nucleus is composed of electrons and neutrons.
   B. Most of an atom is empty space.
   C. Protons move outside the nucleus at a high speed.
   D. Neutrons and protons are much lighter than electrons.

9. Which of the following combinations about the atomic structure of a sulphur atom is correct?

	Number of neutrons	Number of protons	Number of electrons
A.	15	15	17
B.	15	15	16
C.	16	16	16
D.	18	17	17

10. Which of the following atoms has the SMALLEST number of neutrons?

A. ^{50}Ti

B. ^{50}V

C. ^{64}Ni

D. ^{64}Zn

11. Which of the following statements about an atom is INCORRECT?

A. The number of protons must equal the number of electrons.

B. The number of electrons must equal the number of neutrons.

C. The atomic number must equal the number of protons.

D. The mass number must equal the number of electrons plus the number of neutrons.

12. The atomic number and mass number of an atom of an element is 9 and 19 respectively. The atom contains

A. 9 electrons and 10 neutrons.

B. 9 neutrons and 10 electrons.

C. 9 protons and 10 electrons.

D. 9 protons and 19 neutrons.

13. Which of the following atoms has the SMALLEST number of electrons?

A. $^{127}_{53}W$

B. $^{84}_{36}X$

C. $^{195}_{78}Y$

D. $^{80}_{37}Z$

14. The atomic number and mass number of an atom of element X are 11 and 23 respectively. Which of the following statements about X is correct?

A. An atom of X has 12 electrons.

B. X is a solid at room temperature and pressure.

C. X can be represented by the symbol $^{12}_{11}X$.

D. X is stored in water in the laboratory.

15. Which of the following statements about an atom is / are correct?
    (1) A nucleus carries no charge.
    (2) The mass of an atom concentrates at the nucleus.
    (3) Electrons move at a high speed inside a nucleus.

    A. (1) only
    B. (2) only
    C. (1) and (3) only
    D. (2) and (3) only

16. Which of the following statements are correct?
    (1) The mass of a hydrogen atom is nearly the same as that of a proton.
    (2) The mass of an electron is negligible when compared to the mass of a proton.
    (3) The nuclei of atoms of all elements must contain proton(s).

    A. (1) and (2) only
    B. (1) and (3) only
    C. (2) and (3) only
    D. (1), (2) and (3)

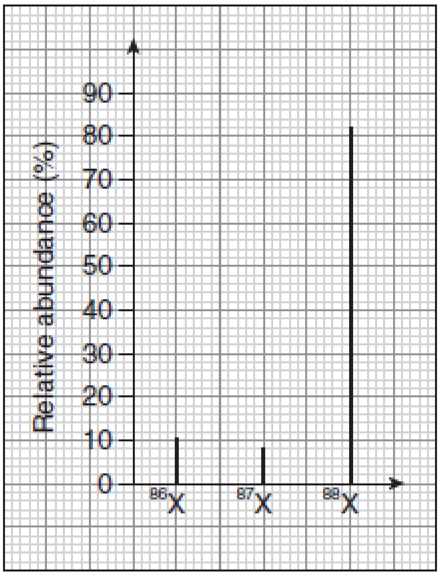
17. The atomic number and mass number of an atom of element X are 17 and 35 respectively. Which of the following statements about X is / are correct?
    (1) An atom of X contains 17 neutrons.
    (2) X is a gas at room temperature and pressure.
    (3) X is used as a sterilizing agent.

    A. (1) only
    B. (2) only
    C. (1) and (3) only
    D. (2) and (3) only

18. Which of the following pairs of atoms have the same number of occupied electron shells?
    (1) Aluminium atom and argon atom
    (2) Carbon atom and neon atom
    (3) Silicon atom and potassium atom

    A. (1) and (2) only
    B. (1) and (3) only
    C. (2) and (3) only
    D. (1), (2) and (3)

19. Element X has three isotopes, ^{86}X, ^{87}X and ^{88}X. The graph below shows the relative abundance of the isotopes.



What is the relative atomic mass of X?

A. 86.7

B. 87.1

C. 87.7

D. 88.1

20. An isotope of chlorine has 20 neutrons. Which of the following statements about the chlorine isotope are correct?

(1) There are three occupied electron shells in the isotope.
(2) Its mass number is 20.
(3) It contains 20 protons.

A. (1) only

B. (2) only

C. (1) and (3) only

D. (2) and (3) only

II. Structured Questions (50 marks)

1. The following table shows the properties of some unknown elements.

Property \ Element	A	B	C
State at room temperature and pressure	gas	solid	liquid
Appearance	dull	shiny	shiny
Electrical conductivity	nil	good	good

(a) Classify A and B into metal or non-metal. Explain your answer. (4 marks)

(b) Which element, B or C, is mercury? Explain your answer. (2 marks)

2. Gallium occurs naturally in two isotopic forms, gallium-69 and gallium-71. The atomic number of gallium is 31.

(a) How many neutrons are there in an atom of gallium-69? (1 mark)

(b) How many neutrons are there in an atom of gallium-71? (1 mark)

(c) The relative atomic mass of gallium is 69.8. Calculate the relative abundance of each isotope in natural gallium. (3 marks)

3. Vanadium has two isotopes.

$$^{50}_{23}\mathrm{V} \quad ^{51}_{23}\mathrm{V}$$

(a) Define the term ‘isotopes’. (2 marks)

(b) Complete the table below to show the number of protons, electrons and neutrons in these two isotopes of vanadium. (3 marks)

Isotope	Number of		
	protons	electrons	neutrons
$^{50}_{23}\mathrm{V}$	23	23	(i)
$^{51}_{23}\mathrm{V}$	(ii)	(iii)	28

(c) A student claims, ‘Both isotopes of vanadium have same physical properties as they belong to the same element.’ State and explain whether he is correct or not. (2 marks)

4. Consider the following elements:

bromine, phosphorus, beryllium and iron

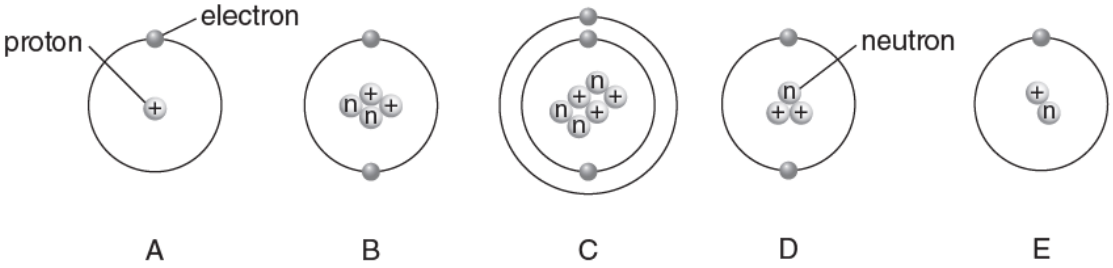
(a) Classify the above elements into metals and non-metals. (4 marks)

(b) Write the chemical symbols of the above elements. (4 marks)

(c) List TWO differences between metals and non-metals. (2 marks)

(d) Some elements have properties of both metals and non-metals. How can these elements be classified as? Also, give ONE example of these elements. (2 marks)

5. The structures of five atoms, A, B, C, D and E, are shown below.



(a) Answer the following questions about these structures. Each structure can be used once, more than once or not at all.

(i) Which TWO structures are hydrogen atoms? (2 marks)

(ii) Which structure represents an atom of a metal? (1 mark)

(iii) Which structure has an atomic number of 3? (1 mark)

(iv) Which structure has two neutrons in its nucleus? (1 mark)

(b) The full atomic symbol of carbon-12 is ${}^{12}_{6}C$. Write down the full atomic symbols of atoms D and E. (2 marks)

(c) Which structure is the isotope of structure B? (1 mark)

6. Write the electronic arrangements and draw electron diagrams for the following atoms:

(a) Argon (3 marks)

(b) Potassium (3 marks)

(c) Calcium (3 marks)

(d) Chlorine (3 marks)

End of paper

PERIODIC TABLE 週期表

GROUP 族

atomic number 原子序

relative atomic mass 相對原子質量

I	II											III	IV	V	VI	VII	0
				1 **H** 1.0													2 **He** 4.0
3 **Li** 6.9	4 **Be** 9.0											5 **B** 10.8	6 **C** 12.0	7 **N** 14.0	8 **O** 16.0	9 **F** 19.0	10 **Ne** 20.2
11 **Na** 23.0	12 **Mg** 24.3											13 **Al** 27.0	14 **Si** 28.1	15 **P** 31.0	16 **S** 32.1	17 **Cl** 35.5	18 **Ar** 40.0
19 **K** 39.1	20 **Ca** 40.1	21 **Sc** 45.0	22 **Ti** 47.9	23 **V** 50.9	24 **Cr** 52.0	25 **Mn** 54.9	26 **Fe** 55.8	27 **Co** 58.9	28 **Ni** 58.7	29 **Cu** 63.5	30 **Zn** 65.4	31 **Ga** 69.7	32 **Ge** 72.6	33 **As** 74.9	34 **Se** 79.0	35 **Br** 79.9	36 **Kr** 83.8
37 **Rb** 85.5	38 **Sr** 87.6	39 **Y** 88.9	40 **Zr** 91.2	41 **Nb** 92.9	42 **Mo** 95.9	43 **Tc** (98)	44 **Ru** 101.1	45 **Rh** 102.9	46 **Pd** 106.4	47 **Ag** 107.9	48 **Cd** 112.4	49 **In** 114.8	50 **Sn** 118.7	51 **Sb** 121.8	52 **Te** 127.6	53 **I** 126.9	54 **Xe** 131.3
55 **Cs** 132.9	56 **Ba** 137.3	57 * **La** 138.9	72 **Hf** 178.5	73 **Ta** 180.9	74 **W** 183.9	75 **Re** 186.2	76 **Os** 190.2	77 **Ir** 192.2	78 **Pt** 195.1	79 **Au** 197.0	80 **Hg** 200.6	81 **Tl** 204.4	82 **Pb** 207.2	83 **Bi** 209.0	84 **Po** (209)	85 **At** (210)	86 **Rn** (222)
87 **Fr** (223)	88 **Ra** (226)	89 ** **Ac** (227)	104 **Rf** (261)	105 **Db** (262)													

*	58 **Ce** 140.1	59 **Pr** 140.9	60 **Nd** 144.2	61 **Pm** (145)	62 **Sm** 150.4	63 **Eu** 152.0	64 **Gd** 157.3	65 **Tb** 158.9	66 **Dy** 162.5	67 **Ho** 164.9	68 **Er** 167.3	69 **Tm** 168.9	70 **Yb** 173.0	71 **Lu** 175.0
**	90 **Th** 232.0	91 **Pa** (231)	92 **U** 238.0	93 **Np** (237)	94 **Pu** (244)	95 **Am** (243)	96 **Cm** (247)	97 **Bk** (247)	98 **Cf** (251)	99 **Es** (252)	100 **Fm** (257)	101 **Md** (258)	102 **No** (259)	103 **Lr** (260)

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Chemistry
(45 minutes)
Answer Sheets

Date: 23rd October 2020 Name:____________________
Time: 9:45a.m. - 10:30a.m. Class: ________ No.:_______

I. Multiple Choice Questions (20 marks)

Please put a tick in the appropriate box below.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
A																				
B																				
C																				
D																				

II. Structured Questions (50 marks)

End of Answer Sheets