FUKIEN SECONDARY SCHOOL S3 First Term Examination (2020-2021) Biology (45 minutes)

Date: 5th January 2021 Time: 10:15a.m.- 11:00a.m.

Name:	
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 this paper is 50.

I. Multiple Choice Questions (20 marks)

1 The diagrams below show four pots of seeds.



To investigate the effect of depth of planting on seed germination, the results of which two pots should be compared?

- **A** (1) and (2)
- **B** (1) and (3)
- **C** (1) and (4)
- **D** (3) and (4)

2 A student made dough using the following ingredients.

Ingredient	Dough X	Dough Y
Flour	200 g	200 g
Sugar	15 g	20 g
Yeast	1 g	1 g
Water	40 cm^3	40 cm^3

She left the dough at room temperature in the kitchen for two hours. She found that dough X has risen more than dough Y. Which of the following variables caused the difference in the results?

- A temperature of the kitchen
- **B** amount of water
- C mass of yeast
- **D** mass of sugar
- 3 Which of the following combinations is *not* a correct example of the vital functions of organisms?

	Vital function of organisms	Example
A	irritability	humans feel cold and put on a coat
B	reproduction	birds lay eggs
С	nutrition	using the mouth to breath in air
D	movement	plants grow towards light

4 Some cells were observed under a light microscope at different magnifications. If the diaphragm of the microscope was not adjusted during the observation, which of the following images would be the brightest?



- 5 Water is important to humans because
 - (1) it acts as a medium for chemical reactions.
 - (2) it helps regulate body temperature of organisms.

- (3) it provides energy for chemical reactions in the cells.
- $\mathbf{A} \quad (1) \text{ only}$
- **B** (3) only
- \mathbf{C} (1) and (2) only
- \mathbf{D} (1) and (3) only
- 6 All living cells
 - A carry out photosynthesis.
 - **B** come from pre-existing cells.
 - C can move.
 - **D** have a nucleus.
- 7 Which of the following is present in the largest amount in organisms?
 - A water
 - **B** proteins
 - C carbohydrates
 - **D** nucleic acids
- 8 A sample of organic compounds was tested and found to contain carbon, hydrogen, oxygen, nitrogen and sulphur atoms only. The compounds are most likely
 - A starch.
 - **B** cellulose.
 - **C** proteins.
 - **D** nucleic acids.
- 9 Which of the following sub-cellular structures is *not* bounded by a double membrane?
 - A nucleus
 - **B** mitochondrion
 - C vacuole
 - D chloroplast

- 10 When a specimen is observed under a microscope with a 5X eyepiece and a 10X objective, the magnification of the image is
 - **A** ×2.
 - **B** ×5.
 - **C** ×15.
 - **D** ×50.
- 11 Which of the following correctly arranges the subunits of proteins, from the simplest form to the most complex form?
 - (1) amino acids
 - (2) polypeptides
 - (3) dipeptides
 - **A** (1), (2), (3)
 - **B** (1), (3), (2)
 - **C** (2), (1), (3)
 - **D** (2), (3), (1)
- 12 Arrange the following food from having the greatest amount of starch to the least.
 - (1) ham
 - (2) bread
 - (3) corn
 - **A** (1), (2), (3)
 - **B** (1), (3), (2)
 - **C** (2), (1), (3)
 - **D** (2), (3), (1)
- 13 Which of the following are monosaccharides?
 - A starch, galactose and fructose
 - **B** glucose, galactose and fructose
 - C glucose, sucrose and lactose
 - **D** cellulose, fructose and lactose

14 The table below shows the percentages of food substances (by weight) present in a kind of food.

Food substance	Percentage
Carbohydrates	8.2
Proteins	3.3
Lipids	3.8
Dietary fibre	20
Water	64.7

Which food substance gives the greatest amount of energy in the food?

- A Dietary fibre
- **B** Lipids
- **C** Proteins
- **D** Carbohydrates
- 15 Beans are usually rich in
 - A sucrose.
 - **B** cellulose.
 - **C** proteins.
 - **D** fructose.

Directions: Questions 16 and 17 refer to the photographs below, each of which shows some foods.



16 What are the main types of food substances present in the foods shown in the above three photographs?

	Χ	Y	Z
Α	carbohydrates	minerals	proteins
B	dietary fibre	carbohydrates	lipids
С	lipids	carbohydrates	proteins
D	proteins	lipids	dietary fibre

- 17 If the main food substances of the foods shown in Y are in excess in the body, what kind(s) of substances will they be converted to?
 - A glycogen only
 - **B** lipids only
 - **C** glycogen and lipids
 - **D** glycogen and starch
- 18 Which of the following diet is most suitable for a person suffering from constipation?
 - A cheese and coffee
 - **B** fried eggs, white bread and milk
 - **C** wholemeal bread and apple
 - **D** sausages, cookies and orange juice
- 19 Which of the following is *not* a source of energy even under starvation?
 - A carbohydrates
 - **B** lipids
 - **C** proteins
 - **D** water
- 20 People who suffer from kwashiorkor may lack
 - A calcium.
 - **B** protein.
 - **C** vitamin C.
 - **D** vitamin D.

End of Section I

II. Structured Questions (30 marks)

- 1 Our body is made up of over 200 types of cells. Most of them contain the same organelles but the numbers can differ significantly. For example, muscle cells contain a large number of mitochondria. In the salivary gland, which is a site of enzyme production, the secreting cells have a large amount of rough endoplasmic reticulum.
 - **a** Explain why

i	muscle cells contain a large number of mitochondria.	(2 marks)
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ii the secreting cells in the salivary gland have a large amount of rough endoplasmic reticulum. (2 marks)

b State the level of organization of a group of muscle cells. (1 mark)

2 Complete the following table about different sub-cellular structures and their functions. (5 marks)

Sub-cellular structure	Function
	Encloses the cell and controls the movement
ä	of substances in and out of the cell
Nucleus	b
Chloroplast	c
Cell Wall	d
e	Contains water and dissolved substances

3 **a** How many essential amino acids are there out of the 20 amino acids?

- (1 mark) b Meat that contains more essential amino acids are considered as more nutritious. Why? (2 marks) What is the name of the reaction required to link up two amino acids? С (1 mark) d Which structure of the cell controls the making of different protein by the rough ER? (1 mark) What kind of electron microscope is required for us to see the internal e structure of rough ER? (1 mark) f What kind of electron microscope is required for us to see the
- 3-dimensional external structure of rough ER? (1 mark)
- **g** Why can't we see the rough ER using the light microscope? (1 mark)

4 The table below shows some nutritional information of two brands of burgers.

	Mass of food substances (g per 100 g of burger)		
	'Healthy' burger	Chicken burger	
Proteins	13.1	30.0	
Lipids	2.8	13.0	
Water	5	4	

a John is 16 years old. He needs 50 g of proteins per day.

- i Calculate the amount of 'Healthy' burger John needs to eat in order to obtain the amount of proteins he needs per day. (1 mark)
- ii Calculate the amount of chicken burger John needs to eat in order to obtain the amount of proteins he needs per day. (1 mark)

b The manufacturer claimed that the 'Healthy' burger is good for health and less likely to lead to obesity. Use information in the table to explain.

(1 mark)

c It is suggested that adding tomato and vegetable to the burger is also good for health because they are rich in a certain carbohydrate. Name the carbohydrate and explain why this carbohydrate is good for health.

			(4 marks)
d	i	List THREE functions of food to our body.	(3 marks)
	ii	Is 'wood' a food for human? Explain.	(2 marks)

(Bonus question)

iii Is 'wood' made up of glucose molecules? Why is it not sweet?

(3 marks)

End of Paper