**YEAR 11 HUMAN BIOLOGY**

2010

GAS EXCHANGE AND NUTRIENT PROCUREMENT 2A

**SECTION A: MULTIPLE CHOICE – 25 MARKS**

**SECTION B: TERMINOLOGY – 10 MARKS**

**SECTION C: SHORT ANSWER – 45 MARKS**

* Answer all questions on the written section.
* No calculators will be allowed.
* Check your answers carefully.

**Good LuckPART A: MULTPLE CHOICE (25 MARKS).**

Select the best answer from the alternatives provided and mark it on the answer sheets provided.

1. During the process of expiration the:

a) diaphragm lowers.

b) ribs move upwards and outwards.

c) size of the thoracic cavity increases.

d) pressure inside the thoracic cavity increases.

1. The respiratory complaint PLEURISY is caused by:

a) an inflammation of the membrane which lines the lungs, chest wall and diaphragm.

b) a build up of mucus within the lungs.

c) inflation of the intercostal muscles and the diaphragm.

d) collapse of a lung.

1. For optimum gas exchange, the alveoli in the lungs should have:

a) thick walls that have a large surface area.

b) muscular walls with the potential to expand

significantly.

c) thin mucus covered walls.

d) thin walls with the maximum possible surface area.

1. It is impossible to commit suicide by holding one's breath. As soon as one becomes unconscious, breathing starts again. This is due to:

a) the reserve supply of oxygen in the lungs.

b) oxygen reserves in the tissues.

c) the alkalinity of the blood.

d) excess CO2 in the blood which stimulates breathing.

1. Which of the following is the main organ associated with the production of voiced sound?

a) Pharynx.

b) Larynx.

c) Soft palate.

d) Adenoids.

1. An iron lung is used to help people who have trouble breathing. It consists of a cylinder in which the pressure alternates from higher than atmospheric pressure to lower than atmospheric pressure. The patient is put in an iron lung with his or her head outside the cylinder in an air-tight seal around the neck.

An iron lung must take the place of:

a) lungs.

b) bronchial tube.

c) diaphragm and rib muscles.

d) nasal and mouth cavities.

1. Many children in Australia suffer from asthma. Wheezing in asthma would be directly produced by:

a) constriction of the bronchi and bronchioles.

b) grass pollens in the air.

c) mucus obstructing the nasal passages.

d) atmospheric pollution.

1. Compared to inhaled air, exhaled air should contain a higher percentage of:

a) oxygen, carbon dioxide and water vapour.

b) nitrogen, carbon dioxide and oxygen.

c) carbon dioxide and nitrogen.

d) carbon dioxide and water vapour.

**Questions 9 & 10 refer to the information below.**

When air is inhaled it flows through an air tube system to reach the air sacs. The system consists of the following:

**I**-larynx, **II**-bronchioles, **III**-pharynx, **IV**-bronchi, **V**-trachea, **VI**-nasal cavity.

1. Upon inhalation, what order does it follow?

a) VI, V, IV, III, II, I.

b) VI, IV, I, V, III, II.

c) VI, III, I, V, IV, II.

d) VI, IV, II, V, III, I.

1. Which part of the air tube system is common to both the passage of food and air?

a) VI.

b) III.

c) V.

d) I.

1. To stay under water for a much longer time than usual, a swimmer has to inhale and exhale deeply and rapidly for one or two minutes before diving. The most probable reason for this is, the deep breathing:

a) slows down the contraction and relaxation of the

diaphragm muscles.

b) reduces the concentration of carbon dioxide in the

blood.

c) increases metabolic rate and yields more energy for

diving.

d) stimulates the rate of blood circulation for

transport of gases.

1. Which one of the following allows the lungs to move freely and without friction between the inner walls of the thorax?

a) Mucus within the bronchioles.

b) Fluid within the pleura.

c) Moisture in inhaled air.

d) Pulmonary blood supply.

1. The main site of mechanical digestion of food is the…
2. stomach
3. mouth
4. duodenum
5. ileum
6. The basic units which comprise lipids are called
7. fatty acids and glycogen
8. lipase and glucose
9. amino acids and lipase
10. glycerol and fatty acids
11. The gall bladder stores and discharges a product which…
12. acts as a digestive enzyme
13. controls the secretion from the stomach
14. breaks down fats into smaller particles
15. regulates sugar metabolism
16. Digestion is most aptly described as…
17. the intake of any type of food by a living organism
18. the breakdown of large food molecules into smaller absorbable ones.
19. The taking in of soluble, diffusible molecules from the blood into the cells
20. Chewing and swallowing of food
21. Digested foodstuffs are removed from the alimentary canal by the

process of…

1. osmosis
2. diffusion
3. hydrolysis
4. active enzymes
5. In passing from the stomach to the duodenum, food must pass through the
6. pyloric sphincter
7. oesophagus
8. common bile duct
9. cardiac sphincter
10. The inner layer of the alimentary canal consists of…
11. circular muscle
12. mucosa
13. longitudinal muscle
14. submucosa
15. Consider the table below which indicates the parts of the digestive tract where chemical digestion of various food groups occurs.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Section of digestive tract** | **Food 1** | **Food 2** | **Food 3** | **Food 4** |
| Mouth | ✓ |  |  |  |
| Stomach |  | ✓ |  |  |
| Small Intestine | ✓ | ✓ | ✓ |  |

Which of the above foods are more likely to be proteins?

1. Food 1
2. Food 2
3. Food 3
4. Food 4
5. The main function of the large intestine is
6. to store faeces
7. digestion of cellulose
8. absorption of water
9. absorption of digested food

The following diagram is used for the next **two** questions. The following experiment was set up at room temperature to investigate the action of stomach protease (pepsin).

Dilute HCl + Pepsin

Cooked egg white

1. One week later there was no visible change in the egg white. The most logical explanation for this is that
2. the temperature in the room is too low for the pepsin to react
3. the pH of the acid was too high and damaged the structure of the pepsin
4. egg white does not contain protein
5. egg white required both chemical and mechanical digestion in the mouth to prepare it for digestion in the stomach
6. The student wanted to detect traces of the end products of digestion of egg white by pepsin. He should analyse the solution for
7. fatty acids
8. simple sugars
9. amino acids
10. Vitamin B
11. An experiment was set up as shown.

Dilute HCl + pepsin

Water + pepsin

Dilute HCl + pepsin

Water + pepsin

Temp 27o

Temp 47o

Temp 37o

Temp 37o

Cooked egg white

Cooked egg white

Cooked egg white

Cooked egg white

**I**

**II**

**III**

**IV**

In which test tube will the egg white be digested most quickly?

1. I
2. II
3. III
4. IV
5. Absorption of digested food largely occurs in the
6. stomach
7. pancreas
8. small intestine
9. large intestine

END OF MULTI CHOICE SECTION

NAME: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**YEAR 11 HUMAN BIOLOGY**

2010

GAS EXCHANGE AND NUTRIENT PROCURMENT 2A

*WRITTEN SECTION*

**SECTION A: MULTIPLE CHOICE – 25 MARKS**

**SECTION B: TERMINOLOGY – 10 MARKS**

**SECTION C: SHORT ANSWER – 45 MARKS**

* Answer all questions on the written section.
* No calculators will be allowed.
* Check your answers carefully.

**Good LuckMultiple Choice Answer Sheet**

Put a cross (**X**) next to the correct alternative.

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **1** | A | B | C | D |  | **16** | A | B | C | D |
| **2** | A | B | C | D | **17** | A | B | C | D |
| **3** | A | B | C | D | **18** | A | B | C | D |
| **4** | A | B | C | D | **19** | A | B | C | D |
| **5** | A | B | C | D | **20** | A | B | C | D |
| **6** | A | B | C | D | **21** | A | B | C | D |
| **7** | A | B | C | D | **22** | A | B | C | D |
| **8** | A | B | C | D | **23** | A | B | C | D |
| **9** | A | B | C | D | **24** | A | B | C | D |
| **10** | A | B | C | D | **25** | A | B | C | D |
| **11** | A | B | C | D |  |  |  |  |  |
| **12** | A | B | C | D |  |  |  |  |  |
| **13** | A | B | C | D |  |  |  |  |  |
| **14** | A | B | C | D |  |  |  |  |  |
| **15** | A | B | C | D |  |  |  |  |  |

**SECTION B – TERMINOLOGY (10 Marks)**

Give the correct biological term for each of the following.

1. The muscles between the ribs which assist in inhalation and exhalation.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

2. The dome shaped muscle separating the abdominal cavity from the thoracic cavity.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

3. The trachea is prevented from collapsing by rings of

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

4. The process of taking air into the lungs.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

5. The flap of tissue which closes off the trachea when swallowing.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

6. The organ that produces bile using the haemoglobin in worn out red blood cells.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

7. Food moves along the digestive tract due to contractions of muscles along its length. The contractions are called

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

8. The tooth type responsible for the bitting or cutting of food.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

9. The condition characterised by frequent defecation of watery faeces.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

10. The final part of the large intestine in which faeces are formed.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**SECTION C – SHORT ANSWER (45 Marks)**

1. (11 marks)
2. Name the following parts of the digestive tract.

|  |  |
| --- | --- |
| digestive | A: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  B: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  C: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  D: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  E: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  F: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  G: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  H: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  I: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  (9) |
|  |  |

1. Describe the digestive function of parts:

D: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (1)

H: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (1)

1. (12 marks)

Complete the table below about digestion and absorbtion in the small intestine.

|  |  |  |  |
| --- | --- | --- | --- |
| NUTRIENT | Enzymes that digests... | Digestion begins in... | Products of digestion. |
| Starch |  |  |  |
| Protein |  |  |  |
| Lipid |  |  |  |
| DNA |  |  |  |

1. (11 marks)
2. Name and label the structure below.

|  |  |
| --- | --- |
|  | Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Found: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  A: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  B: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  C: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  D: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  E: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  F: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  G: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  (9) |

1. Describe the function of part:

C: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (1)

D: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (1)

1. (5 marks)

The diagram below shows the relationship between an alveolus and a blood capillary.

|  |  |
| --- | --- |
|  | 1. After Inhalation explain why oxygen moves from X to Y and CO2 from Y to X.   \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (2) |

1. Why must the lining of the alveolus remain moist?

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (1)

1. How is the concentration gradient for O2 and CO2 between the air and blood maintained?

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (2)

1. (6 marks)

Describe the characteristics of the lungs that make them well suited to the function they perform.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_