



**Kulleġġ San Nikola Sekondarja tas-Subien, In-Naxxar**  
**St. Nicholas College Naxxar Boys Secondary**  
**Half-Yearly Examinations**  
**February 2016**

Track 3

FORM: 4

BIOLOGY

TIME: 2 Hours

Name \_\_\_\_\_

Class \_\_\_\_\_

**Instructions:**

There are **TWO sections** in this paper.

**Section A – This section carries 55 marks:**

- Write down all your answers on the exam paper.
- **All** questions should be answered.

**Section B – This section carries 45 marks:**

- There are 5 questions but you only answer 3.
- **Answer Question 1 and choose any TWO other questions.**
- Each question carries 15 marks.
- Write your answers for section B on foolscap.

**For Teacher's Use:**

	Section A								Section B					
Question No.	1	2	3	4	5	6	7	8	1	2	3	4	5	
Max. Mark	5	6	5	10	7	5	10	7	15	15	15	15	15	
Actual Mark														<b>Total Mark</b>
														<hr/> <b>100</b>

**Section A: Answer ALL questions in this section.**

1. The role of the digestive system in humans is to break down large food substances into small soluble nutrients.

a. Name the site where digestion starts in humans.

\_\_\_\_\_ 1 mark

b. Name the process that forces food through the oesophagus.

\_\_\_\_\_ 1 mark

c. Briefly explain the process named above.

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_ 3 marks

2. The lungs are responsible for ventilation in humans.

a. Define the term 'ventilation'.

\_\_\_\_\_ 1 mark

b. The lungs are protected by the ribs. Name the muscle present between the ribs.

\_\_\_\_\_ 1 mark

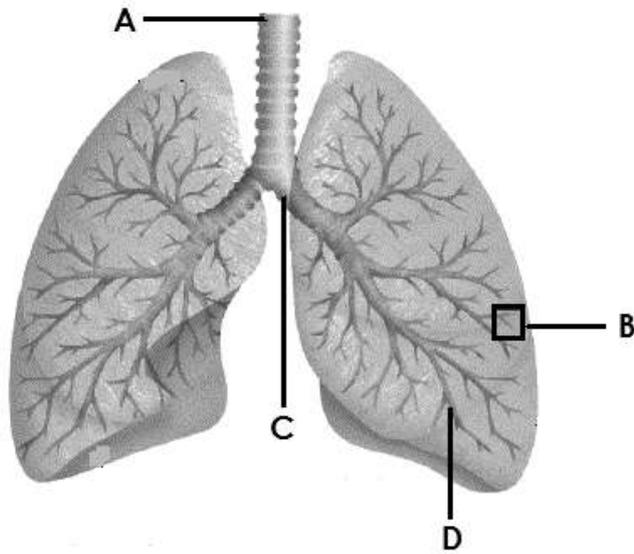
c. State the function of the muscle mentioned above.

\_\_\_\_\_ 1 mark

d. Name the sheet of muscle that separates the lungs from the abdomen.

\_\_\_\_\_ 1 mark

- e. The diagram below shows the structure of the human lungs. Name the parts labelled A – D.



A: \_\_\_\_\_

B: \_\_\_\_\_

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

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

4 marks

3. State the part of the digestive system where:

a. Glucose is absorbed: \_\_\_\_\_

b. Sodium hydrogen carbonate is secreted from: \_\_\_\_\_

c. The digestion of proteins is complete: \_\_\_\_\_

d. Villi are found: \_\_\_\_\_

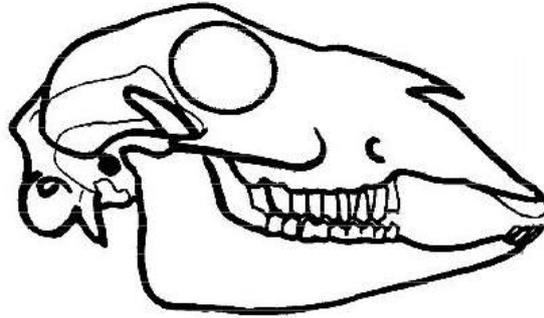
e. Hydrochloric acid is found: \_\_\_\_\_

f. Chemical digestion starts: \_\_\_\_\_

g. Faeces are stored before being egested: \_\_\_\_\_

7 marks

4. During a site visit to the Museum of Natural history in Mdina, a student observed the following skull of a herbivore.



- a. List **THREE** features visible in the diagram that are characteristic of a herbivore jaw.

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3 marks

- b. The student was told that herbivores feed on plant matter that contains starch. Briefly explain how starch is formed in plants.

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1 mark

- c. Describe a chemical test you would carry out in the lab to test a food sample for the presence of starch. State the colour change you would observe for a positive result.

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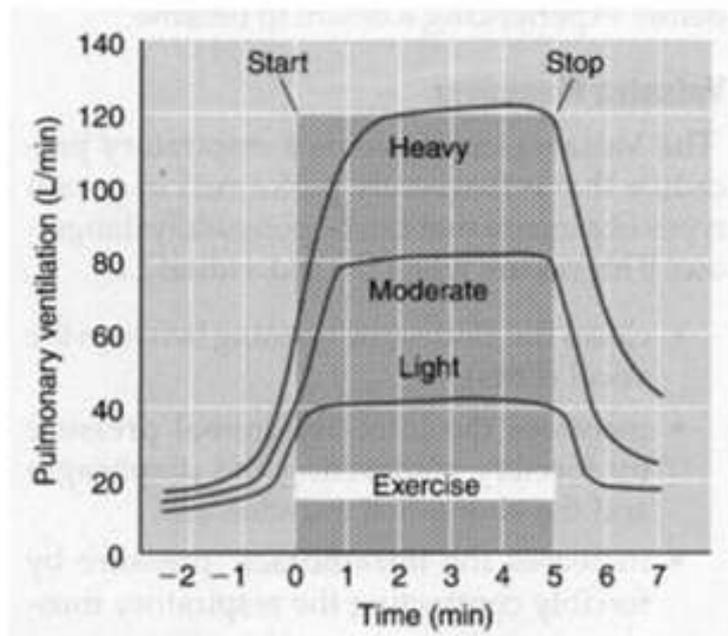
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3 marks

5. The following graph shows the breathing rate at different exercise intensities.



a. Describe the change in the breathing rate taking place during light exercise and heavy exercise.

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2 marks

b. What happens to the volume of the lungs during inspiration?

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1 mark

c. Briefly explain why breathing from the nose is considered healthier than breathing from the mouth.

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1 mark

d. Plants carry out photosynthesis and respiration.

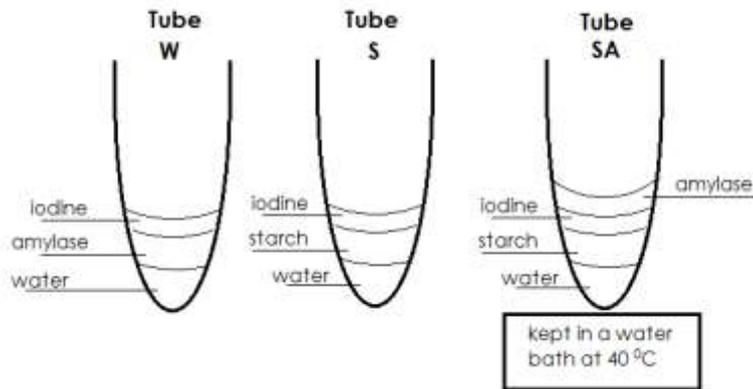
Write down the word equation of photosynthesis.

\_\_\_\_\_ 1 mark

e. Briefly explain why some people prefer to remove plants from their bedroom at night.

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_ 3 marks

6. Luca was carrying out an experiment to investigate the effect of the enzyme amylase on starch solution. He set up the following apparatus:



a. State the function of the enzyme amylase in the human body.

\_\_\_\_\_ 1 mark

b. Explain why tube SA was kept in a water bath at 40°C?

\_\_\_\_\_  
\_\_\_\_\_ 1 mark

c. What is the function of starch in this experiment?

\_\_\_\_\_ 1 mark

d. What result (colour change), if any, would you expect to observe in the tube labelled:

i. W: \_\_\_\_\_

ii. S: \_\_\_\_\_

iii. SA: \_\_\_\_\_

3 marks

e. Give a reason for each result you mentioned above:

W: \_\_\_\_\_

\_\_\_\_\_

S: \_\_\_\_\_

\_\_\_\_\_

SA: \_\_\_\_\_

\_\_\_\_\_

4 marks

7. During heavy exercise, the muscles start carrying out anaerobic respiration.

a. State why this happens.

\_\_\_\_\_

1 mark

b. Describe the movements of the ribcage when a person is breathing out.

\_\_\_\_\_

2 marks

\_\_\_\_\_

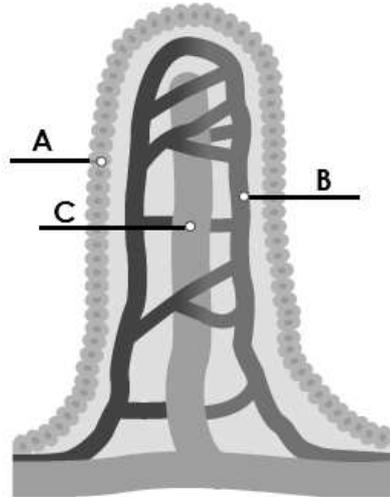
c. Name **ONE** disease caused by cigarette smoking and briefly explain the symptoms of the disease.

\_\_\_\_\_

\_\_\_\_\_

2 marks

8. The diagram below shows the structure of a villus.



a. Name the parts labelled:

A: \_\_\_\_\_

B: \_\_\_\_\_

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

3 marks

b. Describe the function of the villi in the human body.

\_\_\_\_\_

\_\_\_\_\_

2 marks

## **Section B: Answer Question ONE and any other TWO questions.**

1. Yeasts are excellent at alcohol **fermentation**, and humans have taken advantage of this capability in the production of foods and drinks. Alcohol fermentation by yeast is used to produce alcoholic beverages like beer and wine.
- a. Define the word 'fermentation'. 2 marks
- b. Write down an equation showing the process described above which is carried out by yeast to produce alcoholic beverages. 2 marks
- c. Name **ONE** other micro-organism that carries out fermentation and state the product formed by this reaction. 2 marks
- d. A good circulation and good ventilation are required for efficient gas exchange to take place in humans. Briefly explain why. 4 marks
- e. Explain how gas exchange takes place in humans. Draw a diagram to support your answer. 5 marks

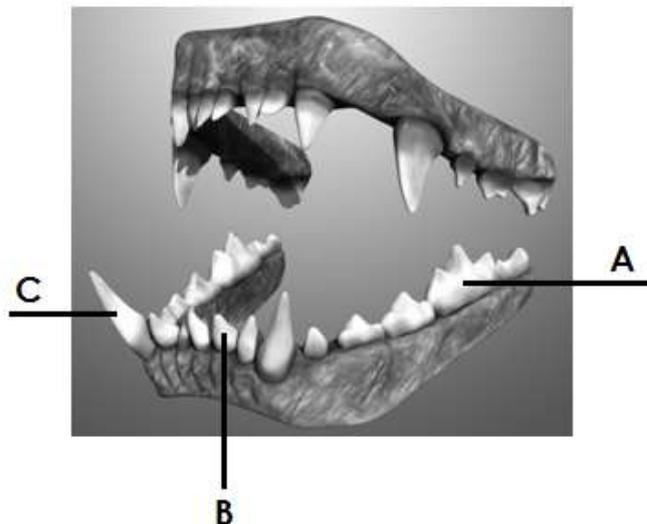
**Total 15 marks**

2. Compare and contrast between:
- a. Scurvy and night blindness 4 marks
- b. Aerobic and anaerobic respiration 4 marks
- c. Carbon dioxide and carbon monoxide 3 marks
- d. Nutrition in amoeba and nutrition in humans 4 marks

**Total 15 marks**

3. Dietary fibre comes from plants. Humans cannot digest fibre but herbivores can.
- a. Give **TWO** reasons why fibre is an important part of a balanced diet. 2 marks
- b. Explain why 'humans cannot digest fibre but herbivore can'. 5 marks
- c. Herbivores have adaptations in their teeth to feed on grass. List **TWO** adaptations and state their functions. 4 marks

d. The diagram below shows the jaw of an animal.



- i. The teeth of this animal show that it is adapted to feed on a particular diet. Name this type of nutrition. 1 mark
- ii. Name the structures labelled A, B, and C. 3 marks

**Total 15 marks**

- 4. All the food that we eat passes through our digestive system.
  - a. Define the term 'digestion'. 1 mark
  - b. State the site of the digestive tract where absorption of water takes place. 1 mark
  - c. For breakfast, John had a slice of bread with butter and cheese and a glass of orange juice. Copy the table below and fill in the missing words. 8 marks

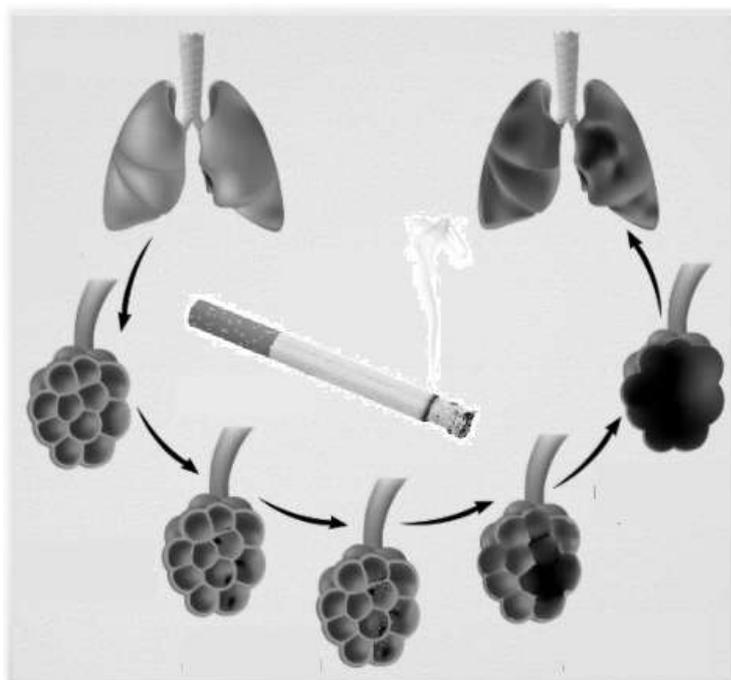
Food	Main nutrient present in the food	Enzyme needed to digest the food
Bread		
Butter		
Cheese		
Orange juice		

- d. Enzymes are biological catalysts that speed up a reaction in our body. List **TWO** characteristics of enzymes. 2 marks
- e. Name the substance responsible for the emulsification of fats. 1 mark
- f. For the substance you named above, state the location where it is: 2 marks
- i. Produced
  - ii. Stored

**Total 15 marks**

5. Discuss the biological message in each of the following posters.

a.



4 marks

b.



3 marks

c.



4 marks

d.



4 marks

**Total 15 marks**