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St. Nicholas College Naxxar Boys Secondary

Track 2

Half-Yearly Examinations
February 2016

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 in this section
- **Answer ANY THREE** 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**	**8**	**7**	**7**	**8**	**10**	**5**	**5**	**15**	**15**	**15**	**15**	**15**	
Actual Mark														**Total Mark** ____ **100**

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

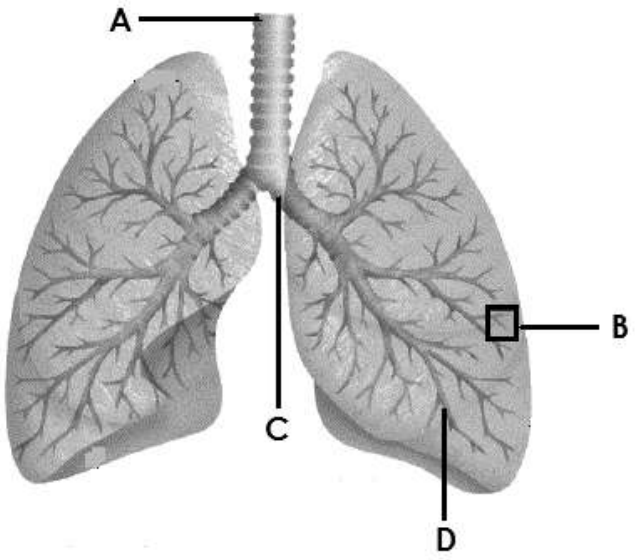
c. State the function of the muscle mentioned above.

_____ 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: _____

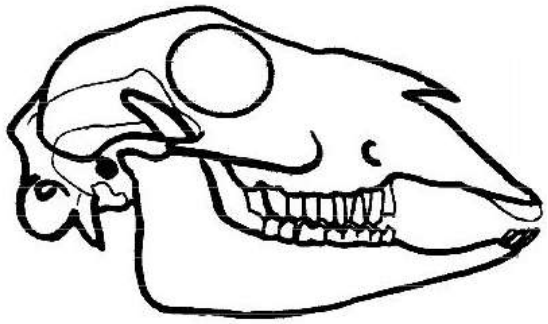
d. Villi are found: _____

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.

_____

_____ 3 marks

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

_____

_____ 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.

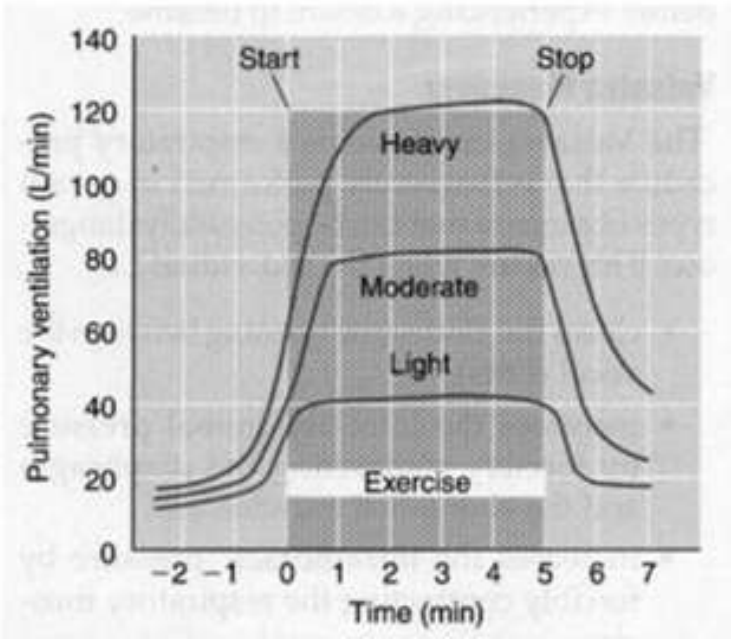
_____

_____

_____

_____ 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.

_____

_____

_____ 2 marks

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

_____ 1 mark

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

_____

_____ 1 mark

d. Plants carry out photosynthesis and respiration.

Write down the word equation of photosynthesis.

_____ 1 mark

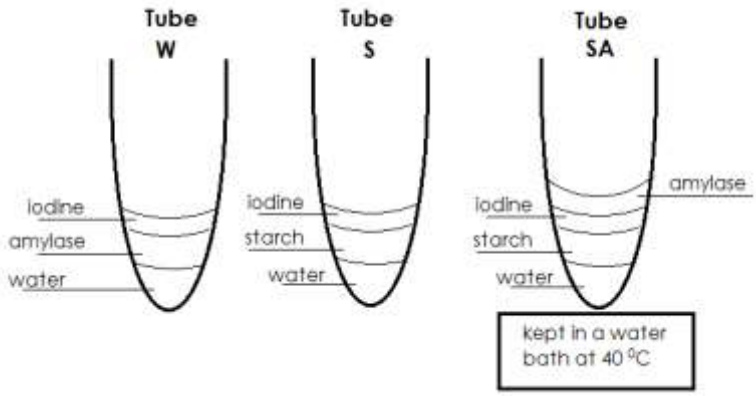
e. Briefly explain why some people prefer to remove plants from their bedroom at night.

_____

_____

_____ 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 40^0C?

_____

_____ 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

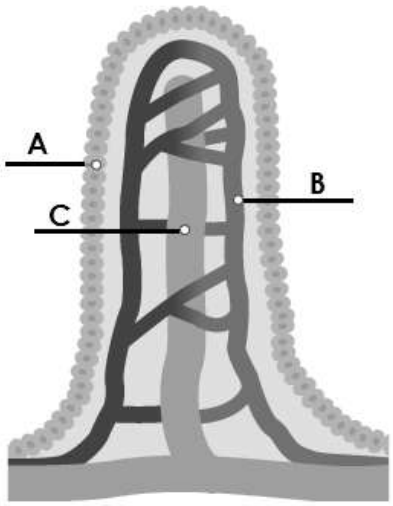
_____

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 ANY THREE 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. Fermentation is another word for anaerobic respiration. Define the term 'anaerobic respiration' — 2 marks

b. Write down the equation of anaerobic respiration which is carried out by yeast cells to produce alcohol. — 2 marks

c. Name **ONE** other micro-organism that carries out anaerobic respiration and state the product formed by this reaction. — 2 marks

d. Name the respiratory surface found in plants and fish. — 2 marks

e. List **TWO** characteristics of an efficient respiratory surface — 2 marks

f. Explain how gas exchange takes place in humans across the alveoli. 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.

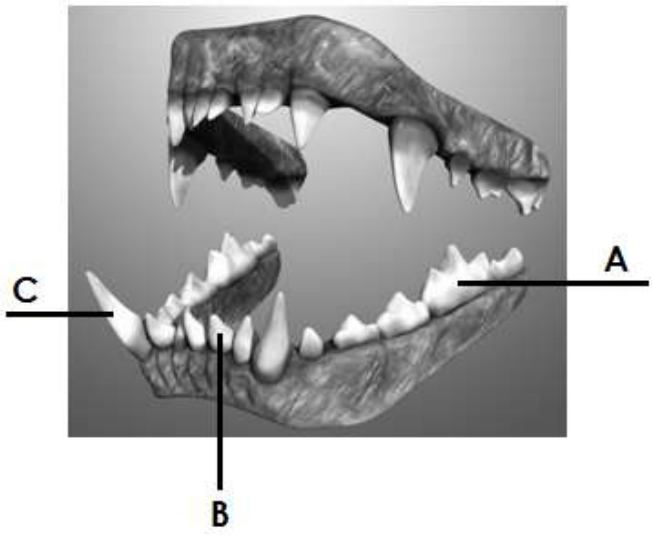
a. Give **ONE** reason why fibre is an important part of a balanced diet. — 1 mark

b. Herbivores have a large chamber called the rumen. Explain the function of the rumen. — 2 marks

c. Which micro-organism is found in the rumen of a herbivore to facilitate the digestion of cellulose? 1 mark

d. Herbivores have adaptations in their teeth to feed on grass. List **TWO** adaptations and state their functions. 2 marks

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



i. The teeth of this animal show that it is adapted to feed only on meat. What is this type of animal called? 1 mark

ii. Name the structures labelled A, B, and C. 3 marks

f. Describe the function of the structures labelled A and C. 2 marks

g. Name **THREE** types of teeth found in humans. 3 marks

Total 15 marks

4. All the food that we eat passes through our digestive system. 1 mark

a. Define the term 'digestion'.

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. 6 marks

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

d. Enzymes are biological catalysts that speed up a reaction in our body. List **TWO** characteristics of enzymes. 2 marks

e. Large fat molecules are difficult to digest. Draw a labelled diagram showing the structure of a lipid molecule. 2 marks

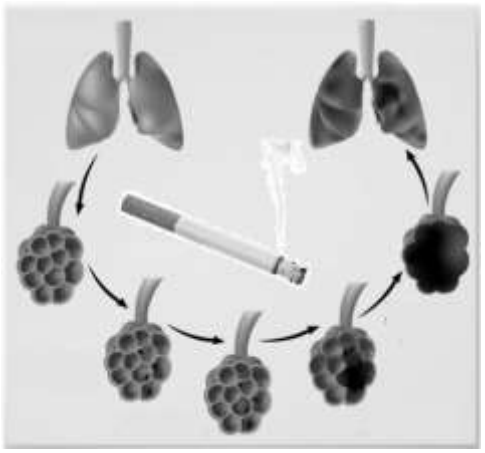
f. Bile is a substance used for the emulsification of large fats molecules. Name the location where bile is produced AND stored. 2 marks

g. Give **ONE** function of fats in our body. 1 mark

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