

FORM TP 2018076



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CARIBBEAN EXAMINATIONS COUNCIL

CARIBBEAN SECONDARY EDUCATION CERTIFICATE®
EXAMINATION

HUMAN AND SOCIAL BIOLOGY

Paper 02 – General Proficiency

2 hours

READ THE FOLLOWING INSTRUCTIONS CAREFULLY.

1. This paper consists of SIX questions in TWO sections. Answer ALL questions.
2. Write your answers in the spaces provided in this booklet.
3. Do NOT write in the margins.
4. If you need to rewrite any answer and there is not enough space to do so on the original page, you must use the extra lined page(s) provided at the back of this booklet. **Remember to draw a line through your original answer.**
5. **If you use the extra page(s) you MUST write the question number clearly in the box provided at the top of the extra page(s) and, where relevant, include the question part beside the answer.**

DO NOT TURN THIS PAGE UNTIL YOU ARE TOLD TO DO SO.

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SECTION A

Answer ALL questions in this section.

1. (a) Figure 1 shows a diagram of the human respiratory system.

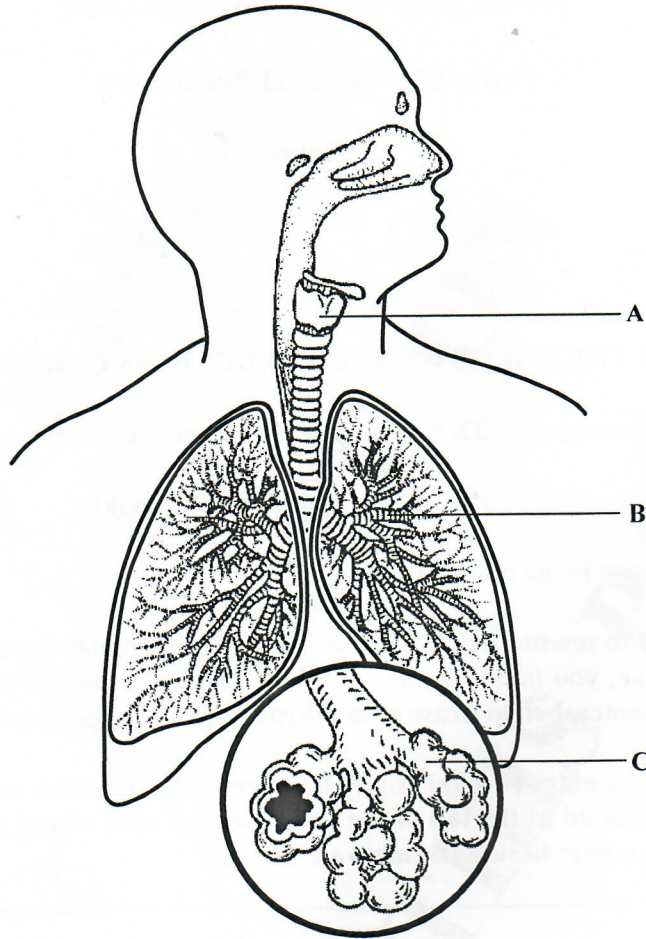


Figure 1. Diagram of the human respiratory system

- (i) Name the structures labelled A and B.

Name of Structure A

Name of Structure B

(2 marks)

- (ii) State the function of the structure labelled C.

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(1 mark)

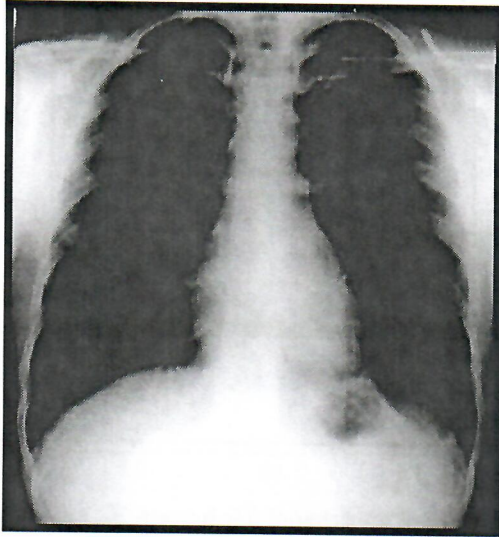
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- (iii) Figure 2 shows two X-ray images of the chest. The X-ray images show the positioning of the organs during breathing.

X-ray D



X-ray E

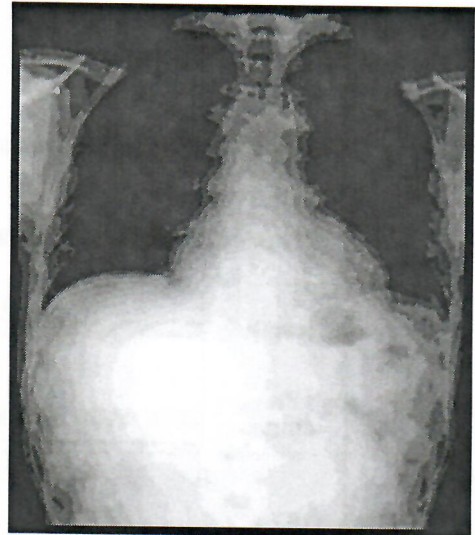


Figure 2. Chest X-ray images

State which X-ray image shows inspiration. Give TWO reasons for your response.

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(3 marks)



(b) Figure 3 shows a graph of the volume of air children inhale during different activities.

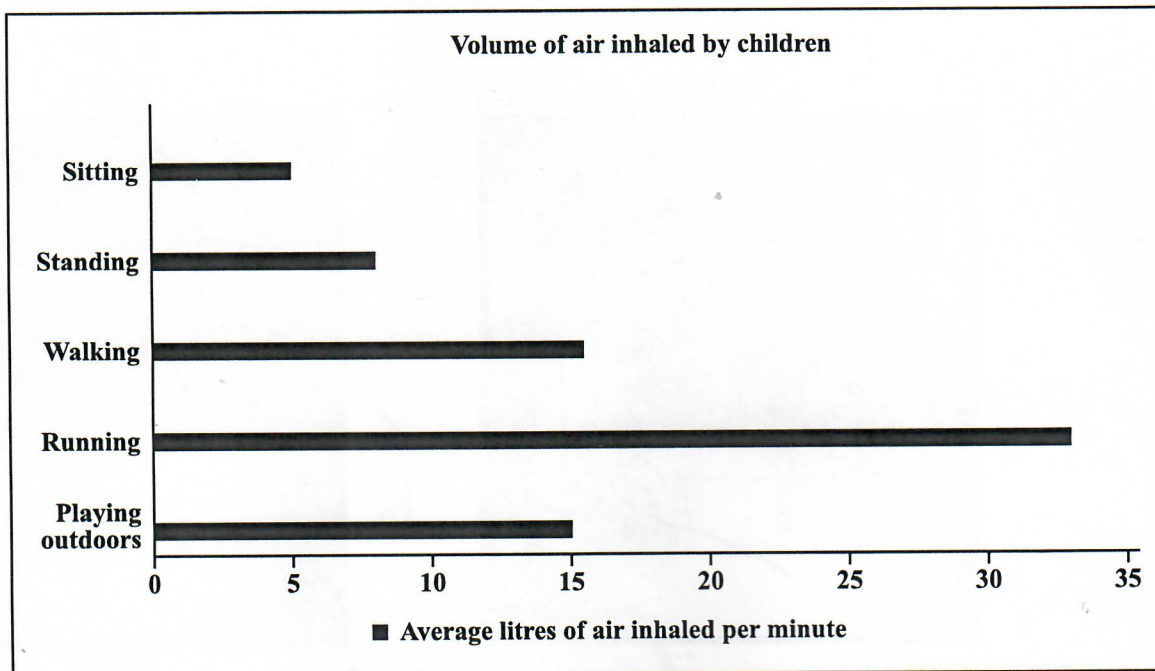


Figure 3. Graph of the volume of air children inhale during activities

Use the graph to determine the activity that involves the MOST intake of air and the activity that involves the LEAST intake of air. Suggest ONE reason for the difference in the intake of air for the two activities.

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(4 marks)

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(c) Figure 4 shows a graph of the breathing rate response to exercise of fit and unfit persons.

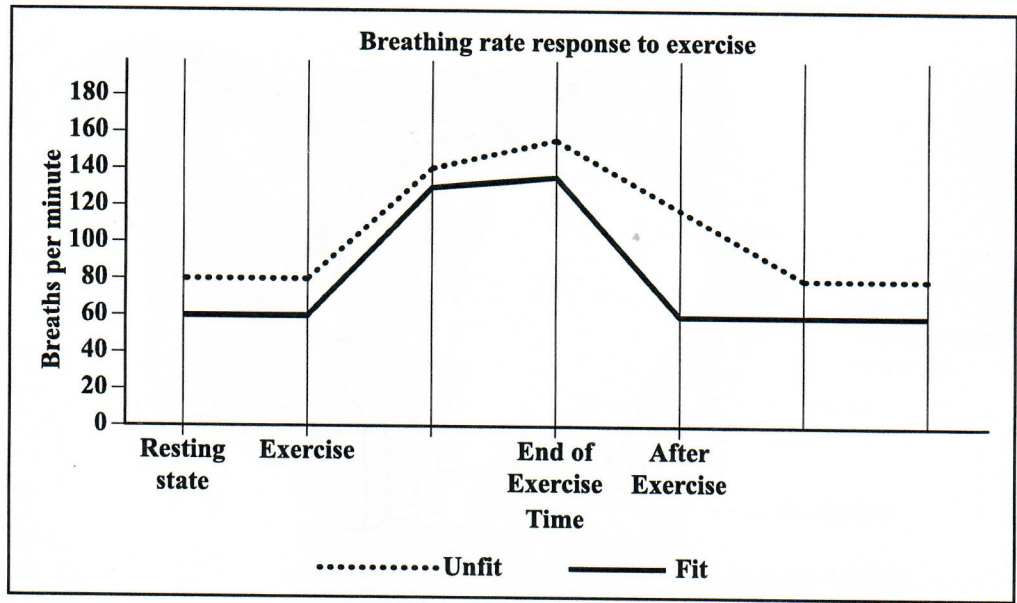


Figure 4. Graph showing the breathing rates of fit and unfit persons

(i) State TWO conclusions which can be made from the graph concerning the breathing rates of fit and unfit persons.

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(2 marks)

(ii) Suggest THREE factors that can contribute to an individual being unfit.

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(3 marks)

Total 15 marks

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2. (a) Figure 5 shows the front view of the female reproductive system.

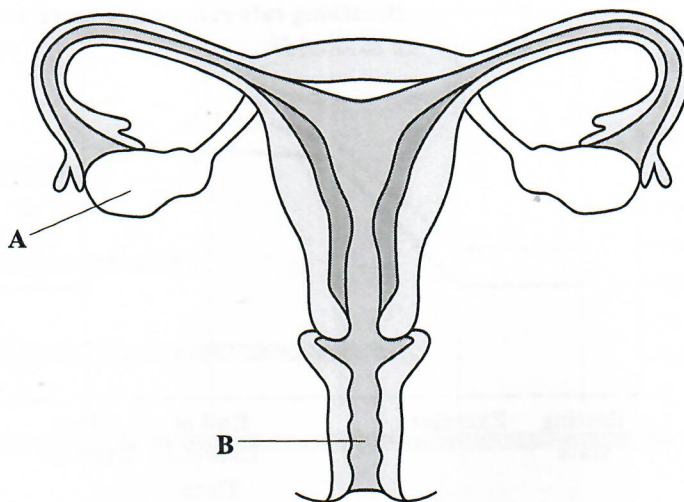


Figure 5. Front view of the female reproductive system

Complete the following table by inserting the name and ONE function of EACH labelled organ, A and B.

Label	Name of Organ	Function of Organ
A		
B		

(4 marks)



(b) Figure 6 shows a diagram of part of the female reproductive system during ovulation.

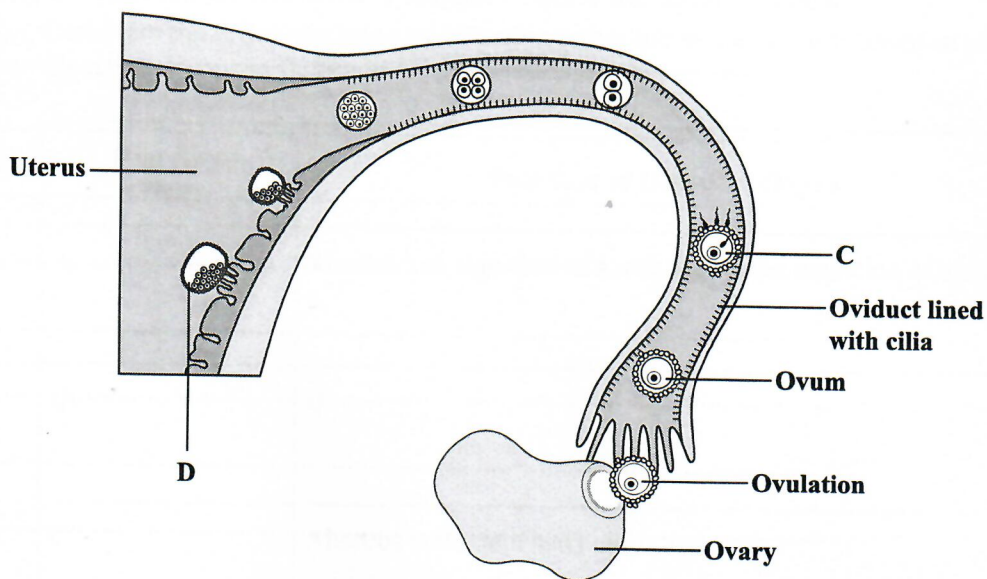


Figure 6. Diagram of female reproductive system during ovulation

Name the processes that are occurring at the areas labelled C and D.

Process at C

Process at D

(2 marks)

(c) Mary has been having miscarriages during the first month of her pregnancies. Her doctor informed her that her ovarian hormonal levels which maintain pregnancy are too low. Suggest to Mary which hormone is being referred to and explain how low levels of this hormone resulted in her miscarriages.

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(3 marks)

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- (d) After being treated for low hormonal levels, Mary becomes pregnant. Her doctor advises her to stop smoking immediately, as women who smoke have more miscarriages than women who do not smoke. Suggest THREE effects that smoking could have on her baby.

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(3 marks)

- (e) Mary considers having an abortion because of the incidence of the Zika virus in the Caribbean and its associated risks. Her doctor explains that a medical abortion can only be done in circumstances where her life is in danger.

- (i) Suggest TWO **other** reasons why an abortion may be considered.

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(2 marks)

- (ii) Explain why a spontaneous abortion could be considered a positive occurrence.

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(1 mark)

Total 15 marks

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3. (a) The digestive system consists of organs which are responsible for the breaking down of ingested food into simple substances that can be assimilated by body cells.

(i) Complete the following table by inserting either the name or ONE function of the digestive organs at A, B and C.

Digestive Organ	Function of Digestive Organ
A.	Mechanical digestion of food; begins the digestion of starch
Liver	B.
C.	Absorbs water and salts only

(3 marks)

(ii) Define the term 'absorption' as it relates to the process of digestion.

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(2 marks)

(iii) State ONE end product of digestion.

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(1 mark)



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(b) A piece of liver and a piece of bread are both crushed and mixed with water. A sample of both is added to THREE test tubes, A, B and C.

(i) Salivary amylase is added to Test tube A and pepsin is added to Test tube B.

Describe what would happen to the liver and the bread in EACH test tube, A and B.

Test tube A

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Test tube B

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(3 marks)

(ii) If hydrogen peroxide is added to Test tube C, state the expected observation and explain why the reaction occurs.

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(2 marks)



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(c) Diabetes mellitus type I is an inheritable disease which is treatable by insulin. Genetic engineering is now being utilized to produce insulin. This involves the use of bacteria and human cells.

(i) Describe the process by which insulin is produced by genetic engineering.

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(3 marks)

(ii) Suggest ONE advantage of using insulin produced by genetic engineering rather than insulin obtained from animals.

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(1 mark)

Total 15 marks

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4. (a) Complete the following table by marking an "X" to indicate which structures are present in EACH cell. The first row has been done for you.

Structure	Bacteria Cell	Animal Cell	Plant Cell
Mitochondria		X	X
Nucleus			
Cell wall			
Mucus membrane			

(3 marks)

- (b) Figure 7 shows a diagram of the cross-section of an animal cell.

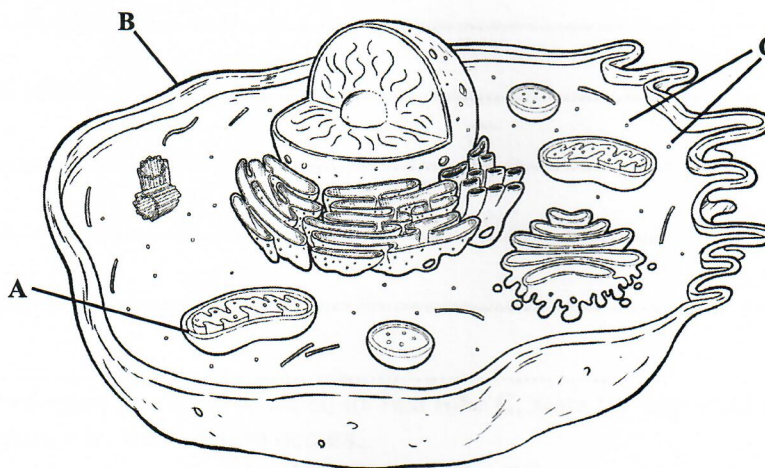


Figure 7. Diagram of the cross-section of an animal cell

Match the labelled structures above with their functions below by placing the correct letter, A, B or C, on the line next to the function.

- (i) Involved in protein synthesis
- (ii) Generates energy for the cell
- (iii) Encloses the contents of the cell

(3 marks)

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(c) Chen, Shiv and Dale purchase similar lunches from a vendor. While eating, the boys notice mosquito larvae swimming in a vase of flowers on a nearby table. A friend joins them and while greeting them sneezes into his hand before shaking Chen's hand. The boys finish lunch and Shiv washes his mouth in a nearby spring.

(i) One week later all of the boys are sick. Chen has the flu, Shiv has contracted cholera and Dale has malaria. Suggest how EACH boy could have contracted his disease.

Chen

Shiv

Dale

(3 marks)

(ii) List THREE possible symptoms that Shiv may experience.

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(3 marks)

DO NOT WRITE IN THIS AREA



- (iii) Suggest THREE preventative actions that could have been taken to reduce the possibility of Dale contracting malaria.

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(3 marks)

Total 15 marks



SECTION B

Answer ALL questions in this section.

5. (a) (i) State ONE advantage and ONE disadvantage of using an antiserum and name ONE situation in which an antiserum should be used.

Advantage

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Disadvantage

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When it is used

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(3 marks)

- (ii) Define the term 'vaccine' and explain how a vaccine differs from an antiserum.

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(3 marks)

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- (b) (i) There is an outbreak of chicken pox and although exposed to this virus, Mia does not contract it. The flu season is approaching so she decides that since she is still breastfeeding her baby, she will get vaccinated for the flu virus.

Identify the THREE types of immunity described in the scenario above and state which type will NOT be long-lasting.

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(4 marks)

- (ii) Suggest ONE short-term benefit and ONE long-term benefit of Mia's baby being vaccinated.

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(2 marks)



- (iii) Mia has developed athlete's foot. Her neighbour says she has some antibiotics that she used for a previous infection and suggests that Mia use some of it. Should Mia use the neighbour's antibiotics? Explain your answer.

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(3 marks)

Total 15 marks



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6. (a) Pit latrines are still commonly used in rural areas within the Caribbean. They provide a means by which sewage is disposed. Figure 8 shows a pit latrine.

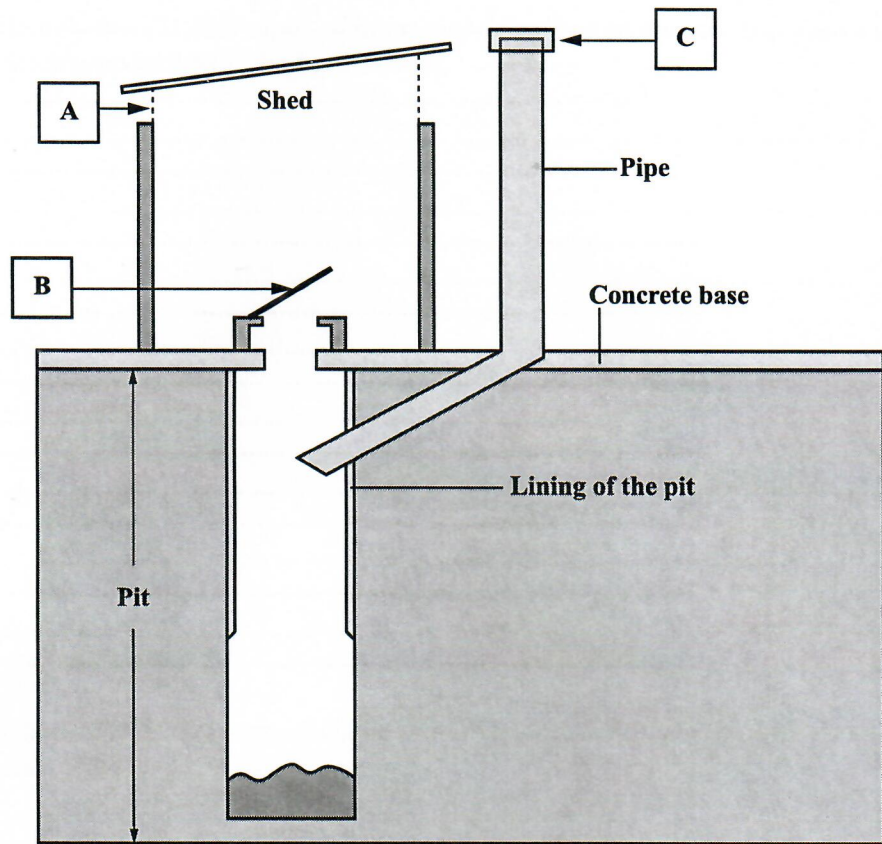


Figure 8. Diagram of a pit latrine

Identify the labelled parts, A, B and C, and state the function of EACH part.

A

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B

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C

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(6 marks)



