

Class	Register Number	Name
-------	-----------------	------



南洋女子中學校
NANYANG GIRLS' HIGH SCHOOL

End-of-Year Examination 2010
Secondary Three

BIOLOGY

Paper 1

Multiple Choice

Thursday

14 October 2010

Additional materials: Multiple Choice Answer Sheet

45 minutes

0800 - 0845

READ THESE INSTRUCTIONS FIRST

Do not open this booklet until you are told to do so.

Write in soft pencil.

Do not use staples, paper clips, highlighters, glue or correction fluid.

Write your name, class and register number on the Multiple Choice Answer Sheet provided.

There are **thirty** questions in this paper. Answer **all** questions. For each question there are four possible answers, **A, B, C** and **D**. Choose the **one** you consider correct and record your choice in **soft pencil** on the answer sheet.

INFORMATION FOR CANDIDATES

Each correct answer will score one mark. A mark will not be deducted for a wrong answer. Any rough working should be done in this booklet.

This document consists of **15** printed pages.

Setter: BK, KHN & OC

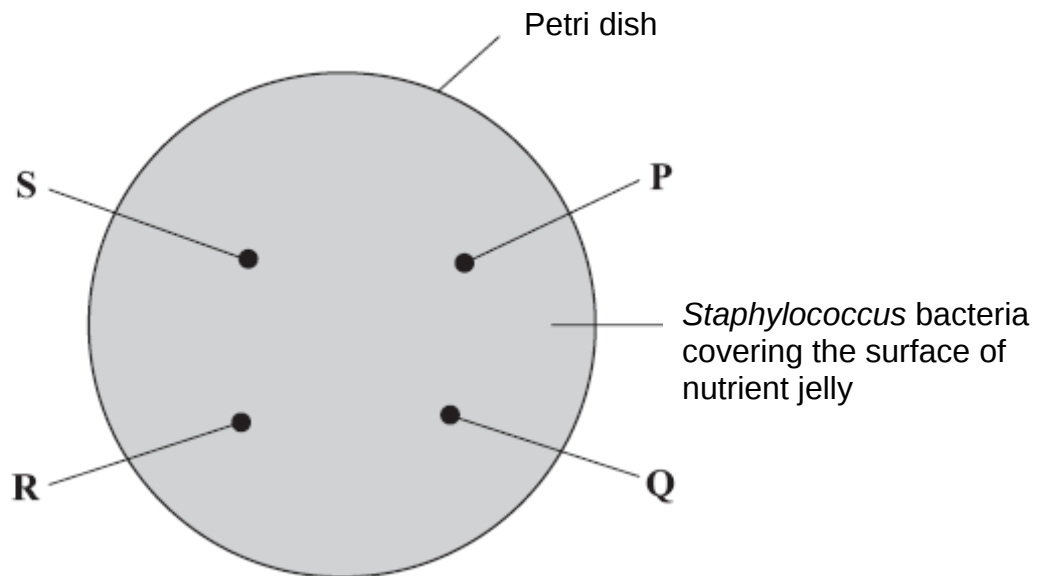
NANYANG GIRLS' HIGH SCHOOL

[Turn over

Questions 1,2 and 3 refer to the diagrams below.

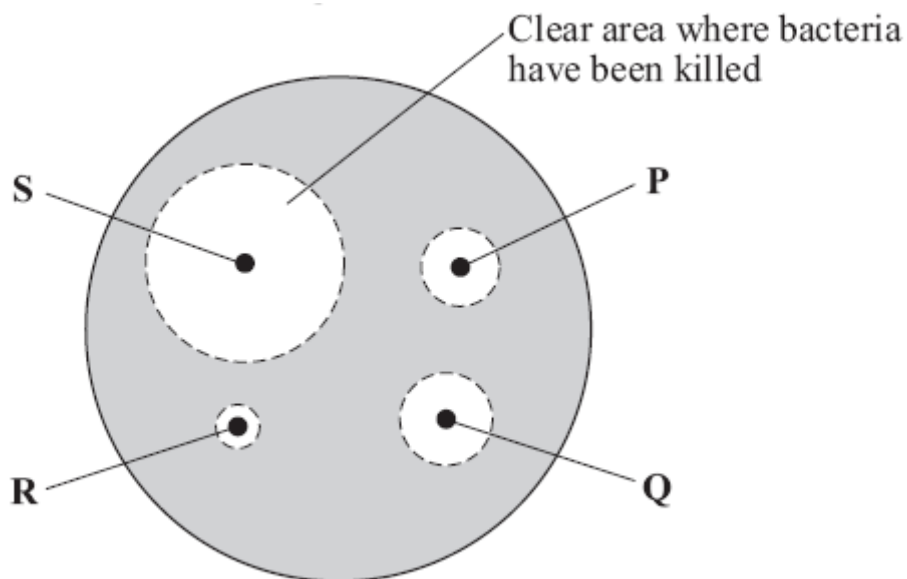
Students investigated the effectiveness of four different antibacterial mouthwashes, **P**, **Q**, **R** and **S**. Identical filter paper discs were soaked in mouthwashes **P**, **Q**, **R** and **S** respectively.

The discs were then placed on *Staphylococcus* bacteria growing in a petri dish, as shown in the diagram below.



The dish was covered and left for 48 hours.

The diagram below shows the appearance of the petri dish after 48 hours.



1 What was the independent variable in this investigation?

- A The temperature of the room.
- B The type of mouthwash.
- C The time the dish was left for incubation.
- D The size of the clear area.

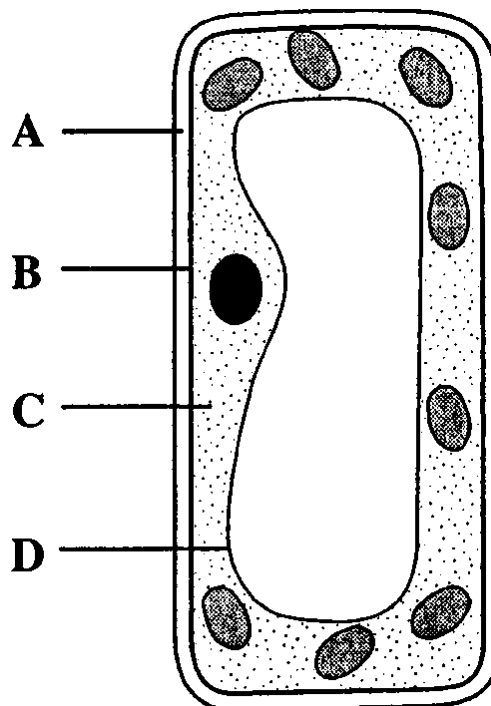
2 Which was a controlled variable in this investigation?

- A The diameter of each bacterium.
- B The diameter of the petri dish.
- C The diameter of the clear area.
- D The diameter of each filter paper disc.

3 Which mouthwash killed the most *Staphylococcus* bacteria?

- | | |
|---|---|
| A | P |
| B | Q |
| C | R |
| D | S |

4 The diagram shows a plant cell. Which label shows the tonoplast?



- 5 Which of the following shows the characteristics of a xylem vessel?

	Nucleus	Chloroplast	Vacuole	Cell wall
A	Present	Present	Present	Present
B	Present	Present	Absent	Absent
C	Absent	Absent	Absent	Present
D	Absent	Absent	Absent	Absent

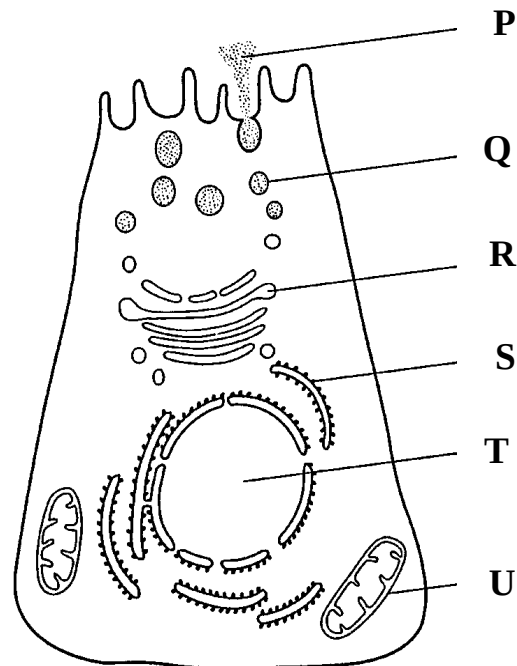
- 6 The table below shows some characteristics of four types of cell. Which cell could be a root hair cell?

	Nucleus	Chloroplast	Mitochondrion
A	✓	×	✓
B	×	✓	✓
C	×	✓	×
D	×	×	×

- 7 A potted plant is left under the sun. After a few hours, a leaf is stained with iodine solution and appeared blue-black. Which structure contributes to the blue-black colouration?

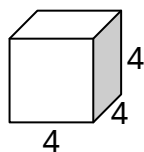
- A** Chloroplast
- B** Nucleus
- C** Air space
- D** Cell wall

- 8 The diagram shows an animal cell.



What is the functional relationship between the labelled structures?

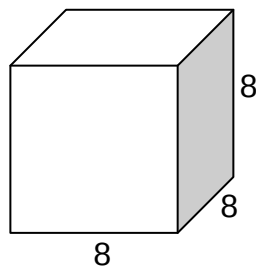
- A P is synthesised by S.
 B Q develops into U.
 C R contains products synthesised by T.
 D S controls the contents of T.
- 9 Four pieces of agar were cut in different sizes and placed into separate dishes of ink. Which block will be stained the fastest? (All units are in cm)



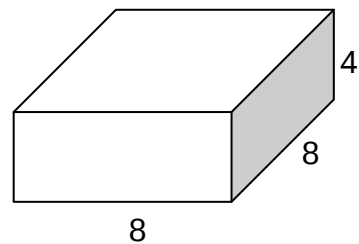
A



B



C



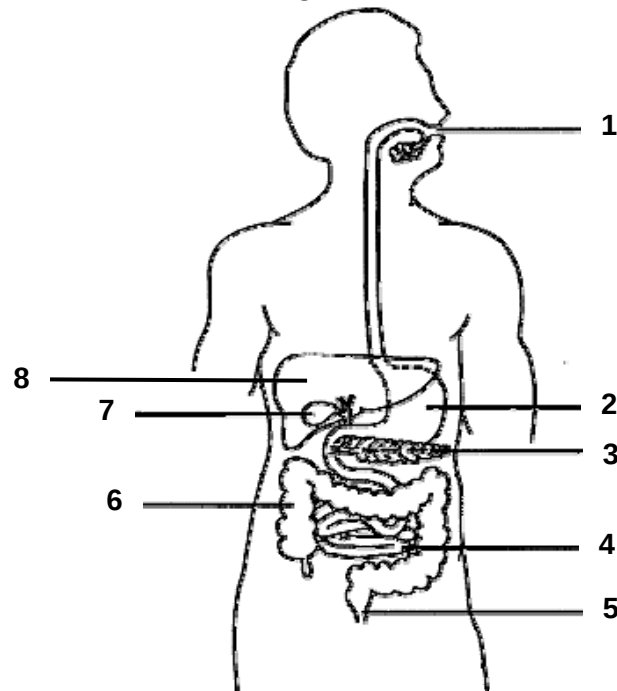
D

- 10** Urine samples from four patients, **A**, **B**, **C** and **D** were tested. Which patient should be treated with insulin injections?

Test Person	Biuret Test	Benedict's Test	Alcohol emulsion test
A	solution formed blue ppt	solution turned violet	solution formed white ppt
B	solution remained blue	solution formed orange ppt	solution remained colourless
C	solution formed orange ppt	solution remained colourless	solution formed white emulsion
D	solution remained violet	solution remained blue	solution remained blue

- 11** What is the terminal (end) portion of the small intestine called?
- A** Cecum
 - B** Duodenum
 - C** Ileum
 - D** Jejunum
- 12** Which of the following organs is not considered part of the digestive system?
- A** Gallbladder
 - B** Pancreas
 - C** Spleen
 - D** Tongue
- 13** Which of the following organs is not considered part of the large intestine?
- A** Appendix
 - B** Colon
 - C** Glottis
 - D** Rectum

Questions 14 and 15 refer to the figure below.



14 Which part **1**, **2**, **3** or **4** does most hydrolysis of triglycerides occur?

- A** 1
- B** 2
- C** 3
- D** 4

15 In which of the following structures does most absorption of water occur?

- A** 5
- B** 6
- C** 7
- D** 8

- 16** The following statements refer to light-dependent and light-independent reactions of photosynthesis.

Statement 1 – Oxygen is produced.

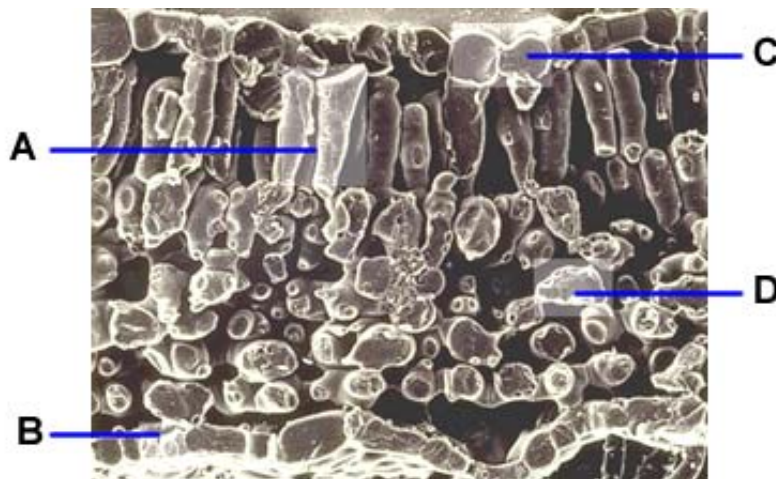
Statement 2 – Carbon dioxide is fixed.

Statement 3 – Occurs in stroma.

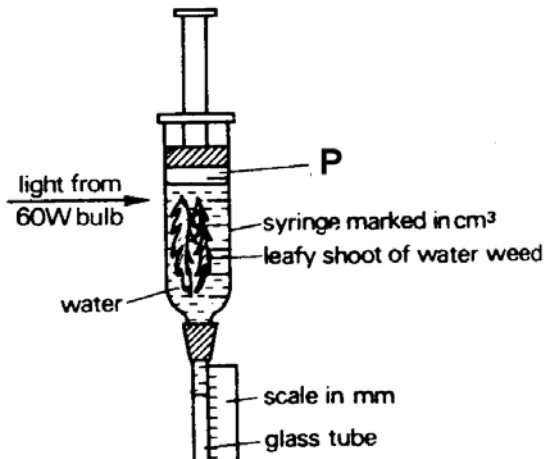
Which of the following shows the correct match of statements to reactions?

	Light-dependent reactions	Light-independent reactions
A	1, 3	2
B	2, 3	1
C	1	2, 3
D	2	1, 3

- 17** The micrograph shows the shapes of the cells in a section of a leaf. In which cell type does most photosynthesis occur?

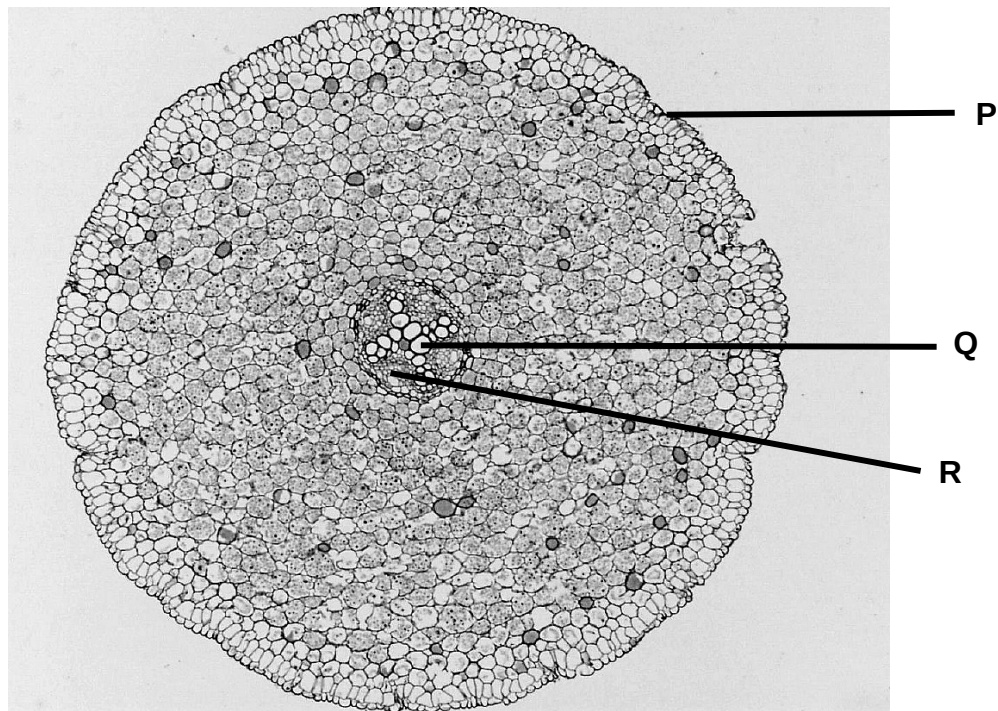


Questions **18** and **19** refer to the diagram below which shows an apparatus that is set up to investigate the rate of photosynthesis in a waterweed.



- 18** Which of the following will significantly increase the rate of photosynthesis of the waterweed?
- A** Submerge the waterweed more by attaching paper clips to it.
 - B** Increase the light intensity of the bulb to 100 W.
 - C** Increase the volume of water in the syringe.
 - D** Increase the space P in the syringe.
- 19** In this experiment, what is the limiting factor in the rate of photosynthesis in the waterweed?
- A** The temperature of the environment.
 - B** The volume of water in the syringe.
 - C** The level of oxygen dissolved in the water.
 - D** The level of carbon dioxide dissolved in the water.

- 20** The photomicrograph below shows a cross section of a *Ranunculus* root.



Source: <http://sols.unlv.edu/Schulte/Anatomy/Roots/RanunculusRoot.jpg>

Identify structures **P**, **Q** and **R**.

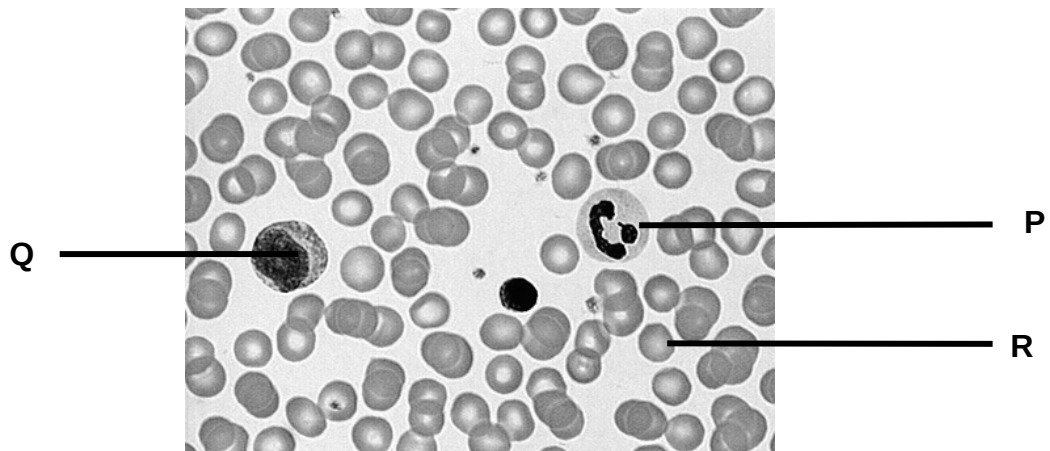
	P	Q	R
A	xylem	phloem	epidermis
B	phloem	xylem	endodermis
C	epidermis	xylem	phloem
D	endodermis	phloem	xylem

- 21** The following statements describe the blood clotting process.
Arrange the statements in order.

- 1** Fibrinogen is converted to fibrin.
- 2** Mesh traps blood cells, forming a clot.
- 3** Prothrombin is converted to thrombin.
- 4** Damaged tissue and platelets produce thrombokinase.
- 5** Fibrin units form threads which form a mesh.

- A** 1, 2, 3, 4, 5
B 1, 3, 4, 5, 2
C 4, 1, 3, 2, 5
D 4, 3, 1, 5, 2

22 The following photomicrograph shows a blood smear.



Source: <http://lifesci.rutgers.edu/~babiarz/Histo/Blood/Smear2.jpg>

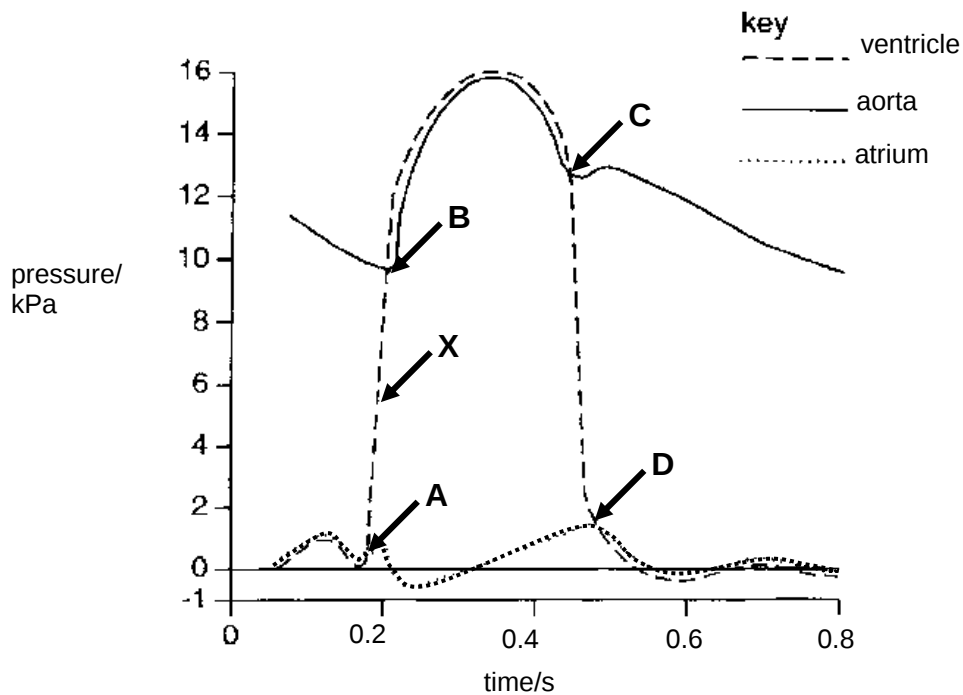
Identify the following cells **P**, **Q** and **R**.

	P	Q	R
A	white blood cell	white blood cell	white blood cell
B	red blood cell	red blood cell	white blood cell
C	white blood cell	white blood cell	red blood cell
D	red blood cell	red blood cell	red blood cell

23 The relative concentrations of substances in the hepatic portal vein (HPV) and hepatic vein (HV) were compared. Predict the relative concentrations of substances between the two veins (> means higher than, < means lower than).

	glucose	carbon dioxide	urea
A	HPV > HV	HPV < HV	HPV < HV
B	HPV < HV	HPV > HV	HPV < HV
C	HPV > HV	HPV > HV	HPV > HV
D	HPV < HV	HPV < HV	HPV > HV

Questions **24** and **25** refer to the graph below, which shows the cardiac cycle.

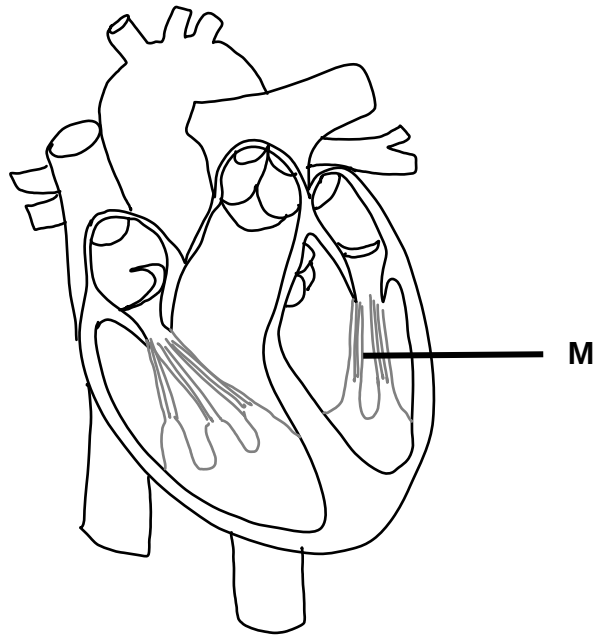


24 The bicuspid valve closes at ____.

25 The best explanation for the pressure at **X** is ____.

- A** the ventricle walls are contracting
- B** the semilunar valve prevents backflow of blood
- C** there is a backsplash of blood against the aorta
- D** the atrium is contracting, so there is a backpressure

- 26 The diagram shows a sectional view of the heart.

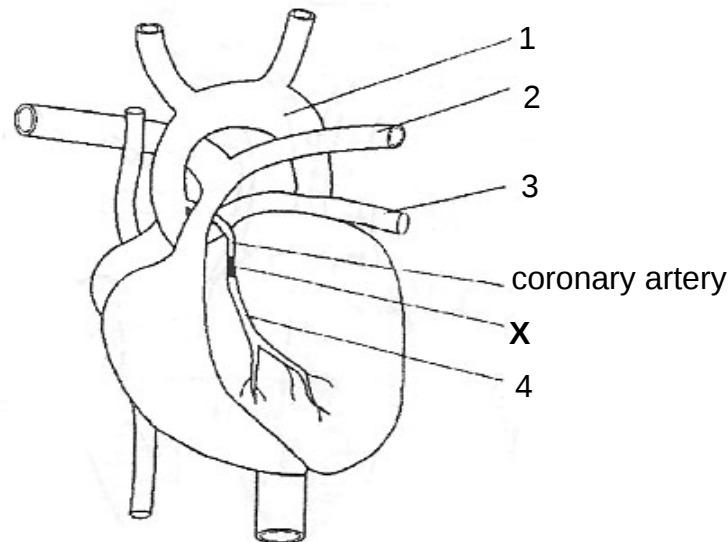


If structure **M** fails in its function, predict the outcomes.

- I** The mitral valve does not prevent backflow of blood.
- II** The tricuspid valve does not prevent backflow of blood.
- III** There will be no blood pressure in the left ventricle.
- IV** The left ventricle begins to contract harder.

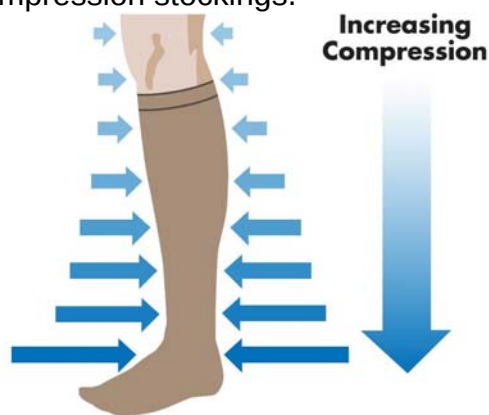
- A** I and III
- B** II and III
- C** II and IV
- D** I and IV

- 27 The following diagram shows a heart with a blockage at point X of the coronary artery.



Suggest where a bypass could be made.

- A between 1 and 3
 - B between 1 and 4
 - C between 2 and 3
 - D between 2 and 4
- 28 The figure below shows compression stockings.



Source: <http://www.insuranceplanavenue.com/>

Compression stockings are recommended when flying on a plane for more than 8 hours, especially in Economy class. Suggest a reason why.

- A It improves arterial circulation
- B It maintains venous circulation
- C It compresses capillaries in the legs
- D It prevents backflow of blood in the veins

29 Glycolysis occurs in the

- A** cytoplasm.
- B** chloroplasts.
- C** mitochondria.
- D** endoplasmic reticulum.

30 The table shows the uptake of oxygen by an athlete at rest and under conditions of strenuous exercise.

Condition	O ₂ in inhaled air /%	O ₂ in exhaled air /%	O ₂ uptake /%	Volume of air breathed in and out/dm ³	Breaths per min
Rest	21.0	17.0	4.0	0.5	12
Exercise	21.0	15.0	6.0	2.0	30

What is the volume of oxygen uptake per minute while exercising?

- A** 0.36 dm³
- B** 1.5 dm³
- C** 2.4 dm³
- D** 3.6 dm³

End of paper