



**DEPARTMENT OF
EDUCATION**

**LOWER SECONDARY
SCHOOL CERTIFICATE
EXAMINATIONS**

(LSSCE)

SCIENCE

**Wednesday
14th October 2015**

**Time allowed:
3 hours**

8:30 am – 11:30 am

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INSTRUCTIONS TO CANDIDATES:

(To be read out by the external invigilator before the start of the examination)

There are **46** questions in this paper worth **50** marks. Attempt **ALL** questions even if you are not so sure of some of the answers.

The Examination is divided into three parts:

PART A: Multiple-Choice (Questions 1 to 25)

PART B: Short-Answer (Questions 26 to 45)

PART C: Extended Response (Question 46)

The Answer Sheet is part of the Examination Booklet. Take out the middle pages and remove the Answer Sheet by tearing along the perforation. You may use the blank sheet for rough work.

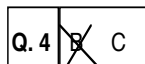
For each question in **PART A** choose the correct answer and write the letter A, B, C or D in the space provided on the **ANSWER SHEET**.

For each question in **PART B and PART C** work out the answer and write the answer in the space provided on the **ANSWER SHEET**.

If you find a question very difficult, do not spend too much time thinking about it. Leave the question out and go on with the rest of the paper. If you have time in the end, return to the difficult questions and think about them more carefully.

Write your answers in **BLUE** or **BLACK** ink (pen or biro).

If you decide to change an answer, make your correction as shown below so that it is clear to the markers what your final answer is. Do **NOT** use **correction fluid** on your answer sheet.



Hand in **BOTH** the Answer Sheet and the papers used for rough work at the end of the examination.

Extra time will NOT be allowed to complete the examination under any circumstances.

The penalty for cheating or assisting others to cheat in national examinations is non-certification.

DO NOT TURN OVER THIS PAGE AND DO NOT WRITE UNTIL YOU ARE TOLD TO START.

PART A: MULTIPLE CHOICE**(QUESTIONS 1 to 25)****25 MARKS**

For each question, choose the correct answer and write the letter A, B, C or D in the space provided on the ANSWER SHEET.

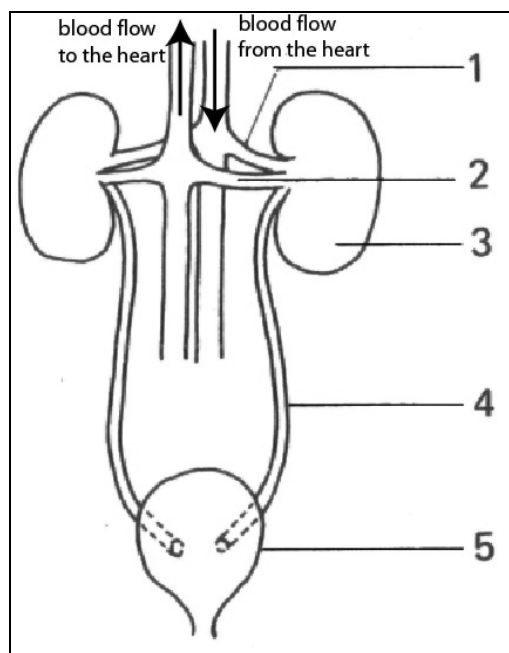
QUESTION 1

Which two (2) activities contribute most to global warming?

- A. Deforestation and reforestation.
- B. Burning of fossil fuels and reforestation.
- C. Deforestation and burning of fossil fuels.
- D. Burning of fossil fuels and decomposition.

For Questions 2 and 3 refer to the following information.

The diagram below shows the urinary system in a mammal. The two arrows in the diagram indicate the direction of the flow of blood to and from the heart while the numbers 1, 2, 3, 4 and 5 represent different parts of the urinary system.

**QUESTION 2**

The correct function of the structure labeled 5 is to

- A. carry urine to the kidneys.
- B. store urine made in the kidneys.
- C. carry water to the kidneys.
- D. store undigested food.

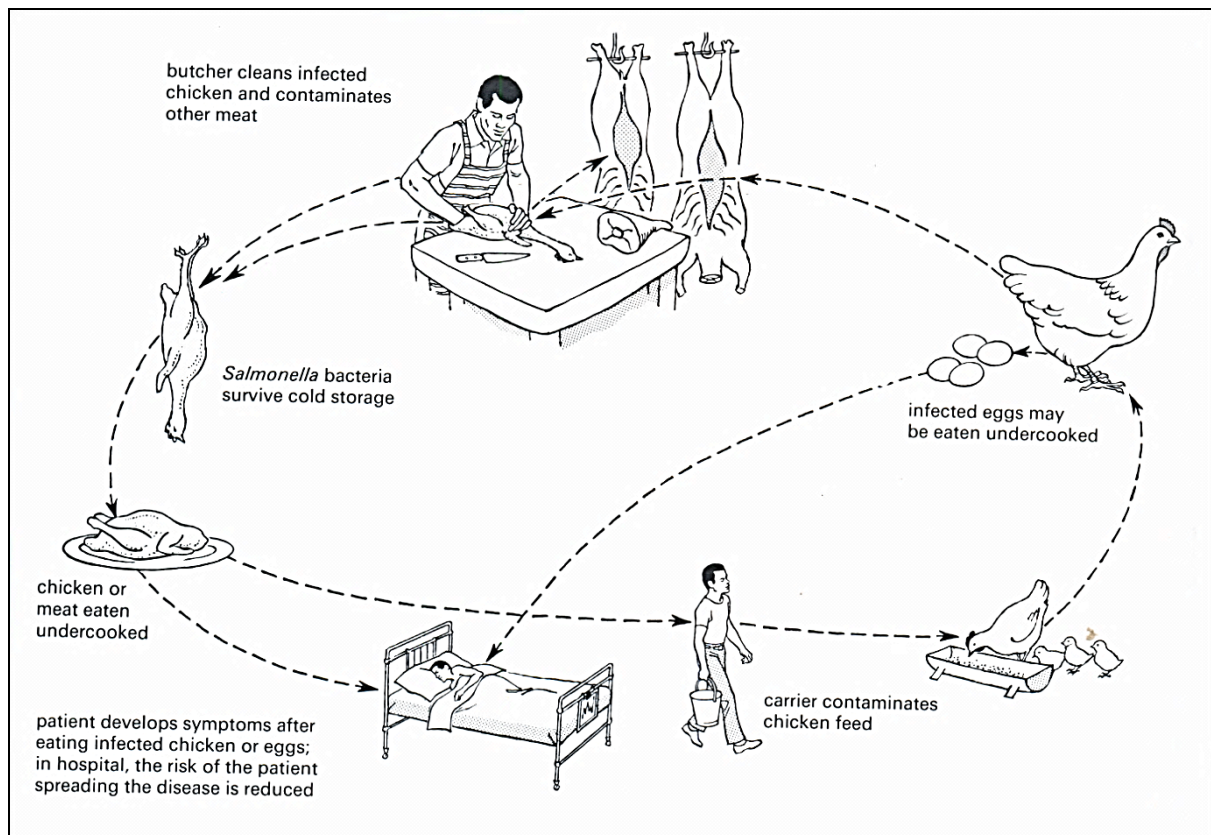
QUESTION 3

The structure labeled 4 carries

- A. urine to the kidneys.
- B. water to the kidneys.
- C. urine to the bladder.
- D. water to the bladder.

For Questions 4 and 5 refer to the following information.

The diagram below shows the stages of the transmission of *Salmonella*, the bacteria which is responsible for food poisoning.



QUESTION 4

According to the diagram, *Salmonella* bacteria

- A. cannot spread to uninfected meat.
- B. can spread when patients are treated.
- C. cannot survive at low temperatures.
- D. can survive in undercooked meat.

QUESTION 5

The diagram shows that *Salmonella* bacteria is mostly transmitted

- A. in food.
- B. in water.
- C. by insects.
- D. by air droplets.

QUESTION 6

Sexually transmitted infections (STIs) are caused by having sexual contact with an infected person.

Below is a list of common STIs in PNG.

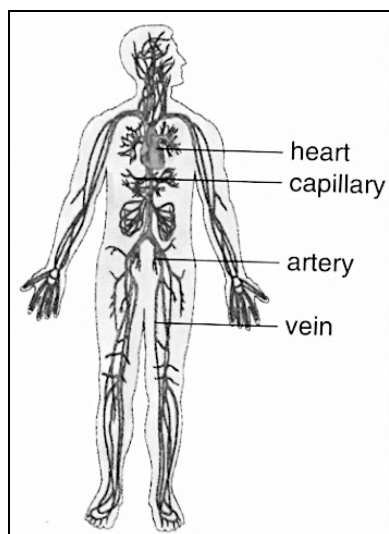
- I. AIDS
- II. Gonorrhoea
- III. Herpes
- IV. Syphilis

Which two (2) of the STI's listed above are mainly caused by bacteria?

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

QUESTION 7

The diagram below shows one of the major systems in the human body.



What is the name of this body system?

- A. Respiratory system
 B. Muscular system
 C. Digestive system
 D. Circulatory system

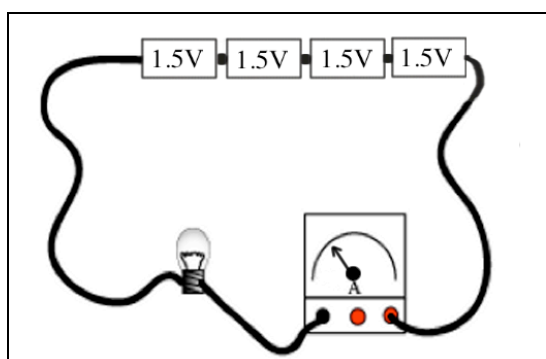
QUESTION 8

Which of the processes below puts oxygen back to the atmosphere?

- A. Burning B. Decomposition C. Photosynthesis D. Respiration

QUESTION 9

The circuit shown below contains a light bulb with a resistance of 5 ohms and 4 dry cells each with a voltage of 1.5 volts. An ammeter is connected with these to give a complete circuit.



The following equation can be used to calculate the value of current in such a circuit.

$$\text{current} = \frac{\text{voltage}}{\text{resistance}}$$

Using the given equation, how much current is flowing in the circuit?

- A. 1.2 amps B. 5 amps C. 14 amps D. 5 amps

QUESTION 10

Below is a list of some electrical devices.

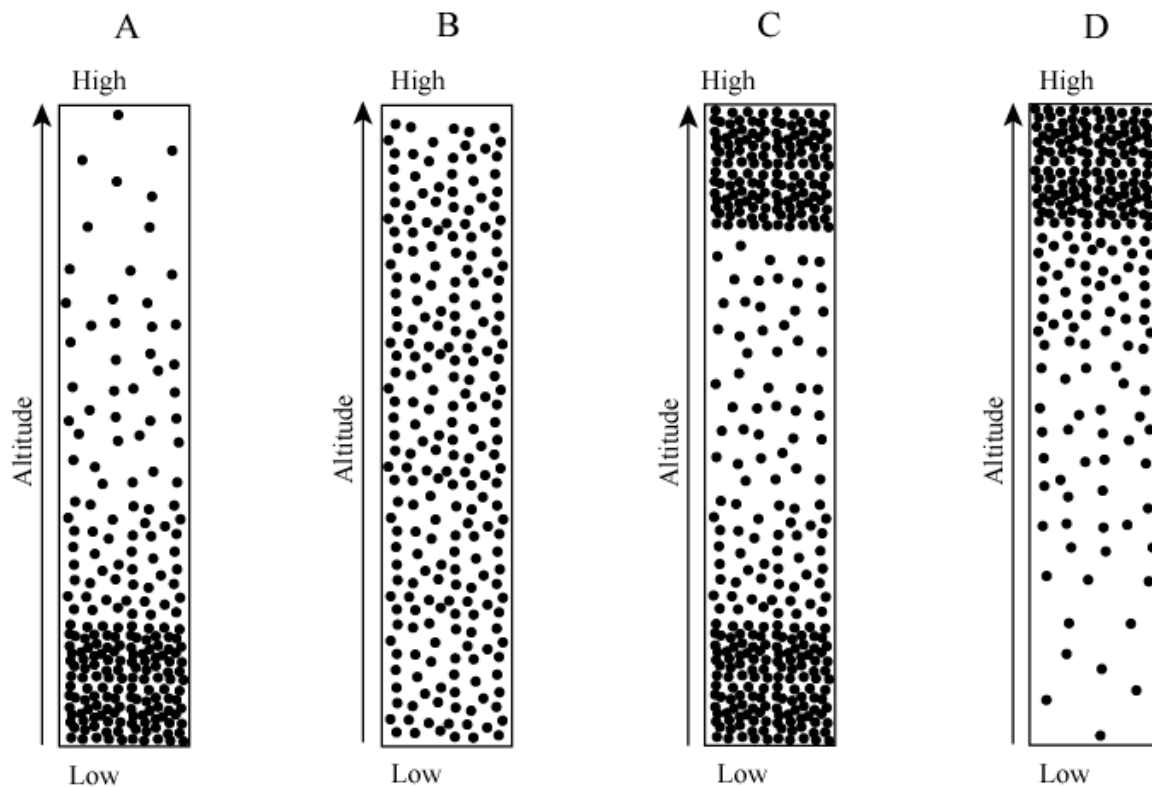
- I. Electric bell
- II. Electric cooker
- III. Electric kettle
- IV. Electric motor

Which two (2) devices listed above mainly operate by making use of the magnetic effect of electricity?

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

QUESTION 11

Which of the following diagrams best shows how air particles vary in a column of air in the Earth's atmosphere as we move from low altitude to high altitude?

**QUESTION 12**

Which plant can increase soil fertility if it is planted in an old garden?

- A. Sweet potato B. Pumpkin C. Cucumber D. Bean

QUESTION 13

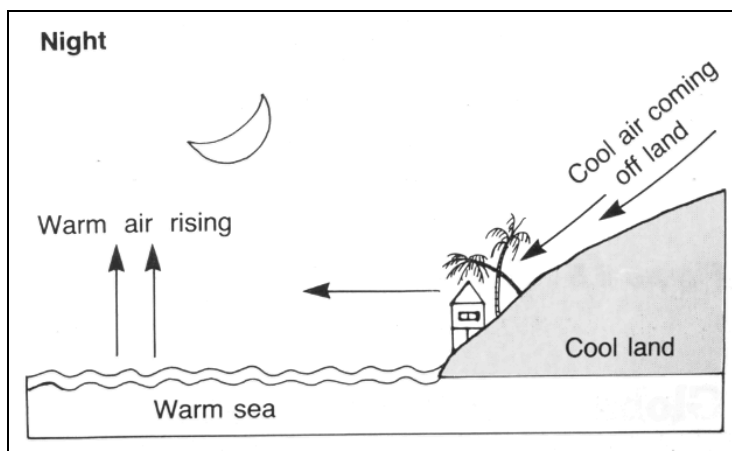
Yeast is a micro-organism which is used in bread making.

Which main group of microbes does Yeast belong to?

- A. Algae B. Bacteria C. Fungi D. Protozoa

QUESTION 14

The diagram below shows how a certain breeze is formed.



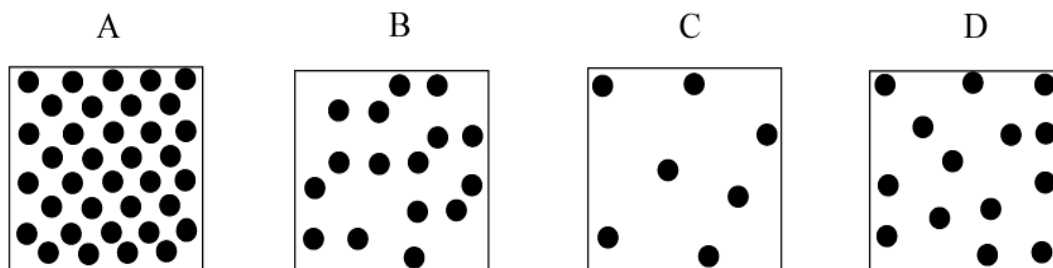
The type of breeze that is shown in the diagram is a _____ breeze.

- A. land B. sea C. mountain D. valley

For Questions 15 and 16 refer to the following information.

Sound waves can only travel through material media such as through, solids, liquids and gases. The waves move through a material medium by causing particles of that medium to knock into one another.

The diagrams below show the arrangements of particles in four (4) different substances A, B, C and D which sound can travel through.



QUESTION 15

Through which substance A, B, C or D would a sound wave travel fastest?

QUESTION 16

Through which substance A, B, C or D would a sound wave travel slowest?

QUESTION 17

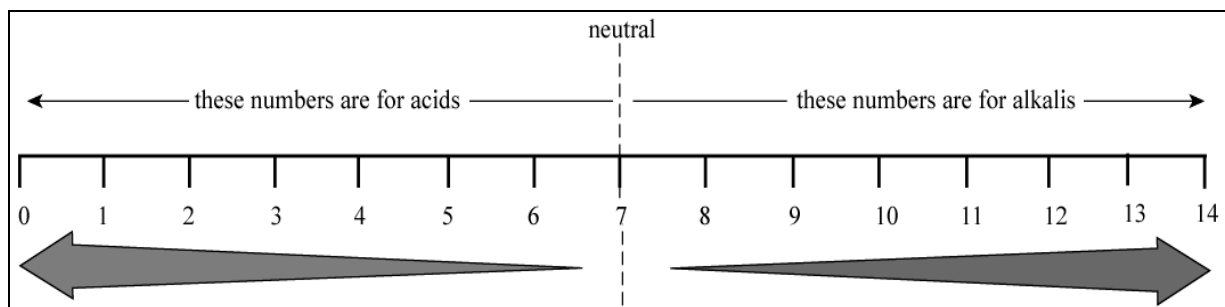
The process of fermentation is responsible for the production of many useful products.

Which of the following substances are produced during fermentation?

- A. Carbon dioxide and yeast. B. Sugar and yeast.
 C. Carbon dioxide and alcohol. D. Sugar and alcohol.

QUESTION 18

Below is the diagram showing the pH scale.



What would be the pH value for hydrochloric acid?

- A. 1 B. 5 C. 7 D. 12

QUESTION 19

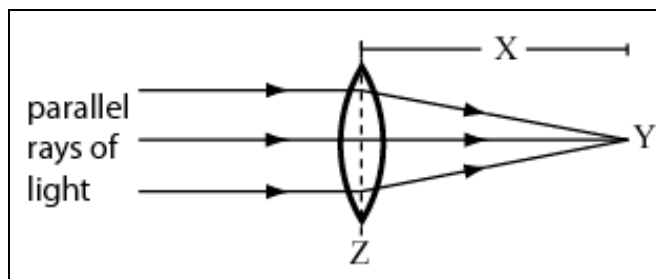
Bromine is an element that is found along period 4 and in group VII.

How many electrons does it have in its outer most shell?

- A. 1 B. 3 C. 4 D. 7

QUESTION 20

The diagram below shows parallel rays of light passing through a lens.

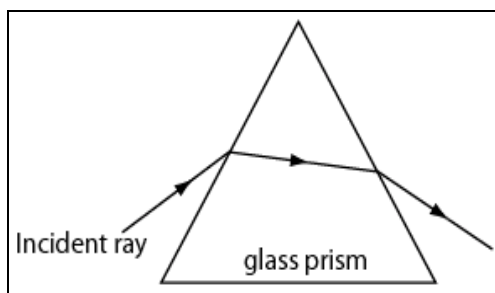


What characteristic of the lens is labelled X?

- A. Axis B. Focal length C. Focal point D. Image distance

QUESTION 21

The diagram below shows a ray of light passing through a prism.



What property of light is shown in the diagram?

- A. Absorption B. Dispersion C. Reflection D. Refraction

QUESTION 22

The table below shows the preservation of meat under different conditions.

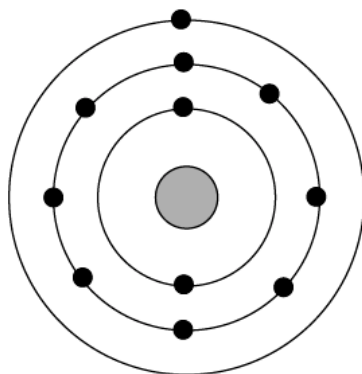
Condition	Temperature	Length of time meat will keep
Freezer	-16°C	3 months
Refrigerator	4°C	4 days
Cool night in the Highlands	15°C	2 days
Midday in the Highlands	25°C	1 day
Coast of PNG	30°C	6 hours

If a piece of meat is cooked in Madang. How many hours longer could the same piece of meat keep from going bad, if it were cooked at midday in Goroka?

- A. 6 hours B. 12 hours C. 18 hours D. 24 hours

QUESTION 23

The diagram below shows the sketch of a particular atom.



The atom shown most likely belongs to the element called

- A. Sodium B. Potassium C. Magnesium D. Calcium

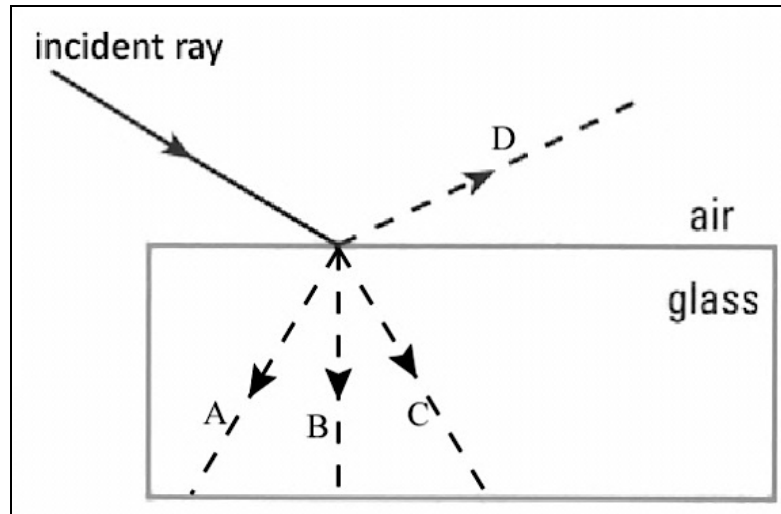
QUESTION 24

In air, a loud sound with a low pitch has a high _____

- A. amplitude. B. frequency. C. note. D. speed.

QUESTION 25

The diagram below shows an incident ray of light passing from air to a rectangular block of glass.



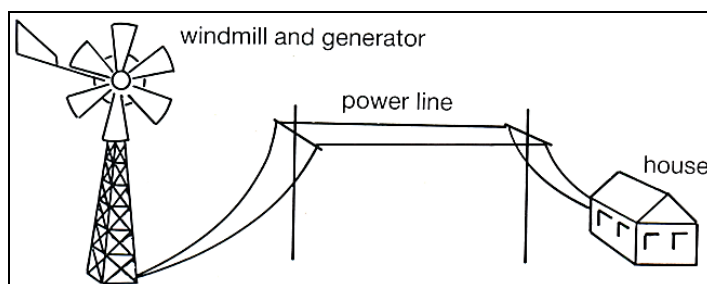
Which of the dashed arrows labeled A, B, C or D correctly shows the direction of the refracted ray?

PART B: SHORT ANSWERS**(QUESTIONS 26 to 45)****20 MARKS****For each question, write the correct answer in the space provided on the ANSWER SHEET.****QUESTION 26**

Name the instrument that is used to measure electric current.

QUESTION 27

The diagram below shows an alternative method of generating electricity.



According to the diagram, what is the natural source of energy used to produce electricity?

QUESTION 28

The three main types of rock are igneous, sedimentary and metamorphic rocks.

Which of these three types of rocks is formed as a result of the cooling down of molten magma?

QUESTION 29If the formula for magnesium carbonate is MgCO_3 .

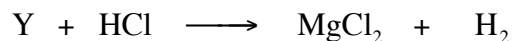
How many atoms are there altogether in one unit of magnesium carbonate? _____ atoms.

QUESTION 30

What is the formula for sodium nitrate? _____

For Questions 31 and 32, refer to the following information.

An unknown metal was placed in a test tube containing dilute hydrochloric acid. An unbalanced symbol equation for this reaction is given below.

**QUESTION 31**

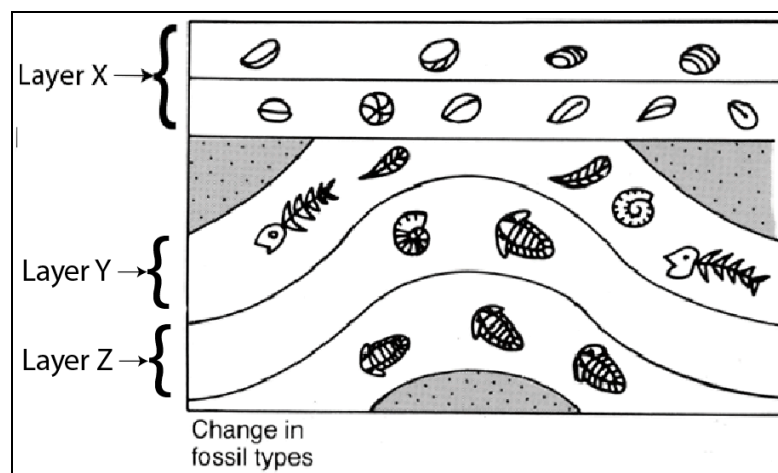
What is the name (not the symbol) of metal Y? _____

*(Correct Spelling required).***QUESTION 32**

What number should be placed in front of HCl to balance the equation? _____

QUESTION 33

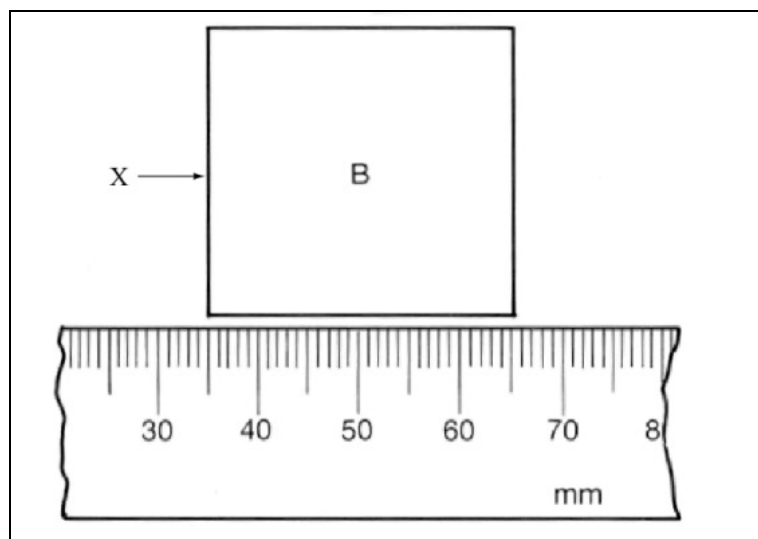
The diagram on the left shows fossils embedded in layers of rock. Three (3) layers X, Y and Z are shown.



Which layer X, Y or Z would contain the oldest fossils?

QUESTION 34

The diagram below shows a small square being measured against a ruler.



What is the length of side X? _____ mm

QUESTION 35

The chemical reaction between copper carbonate and dilute nitric acid is shown by the balanced chemical equation below.



What is the name of the substance given by the symbol $\text{Cu}(\text{NO}_3)_2$?

QUESTION 36

When substance X is treated with dilute hydrochloric acid, a colourless gas which turns limewater cloudy is given off.

The symbol equation for the reaction is;



What is the chemical name (not symbol) of the gas produced? _____

QUESTION 37

Refer to the table below that shows the effect of cigarette smoking on the number of years a person expects to live.

<i>CATEGORY</i>	PRESENT AGE					
	25	30	35	40	45	50
NON-SMOKER	49	44	39	35	30	26
1 – 9 CIGARETTES PER DAY	44	39	35	30	26	22
10 – 19 CIGARETTES PER DAY	43	38	34	29	25	21
20 – 39 CIGARETTES PER DAY	42	36	33	28	24	20

Peter is 30 years old and smokes 15 cigarettes per day.

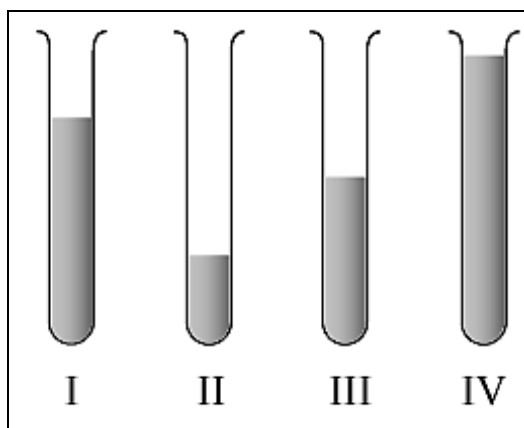
For how many years can Peter expect to live? _____ years.

QUESTION 38

When Calcium metal is burned in air one resulting compound is a white powder called calcium _____.

QUESTION 39

Water is poured to different heights in four (4) identical test tubes labeled I, II, III and IV as shown below.

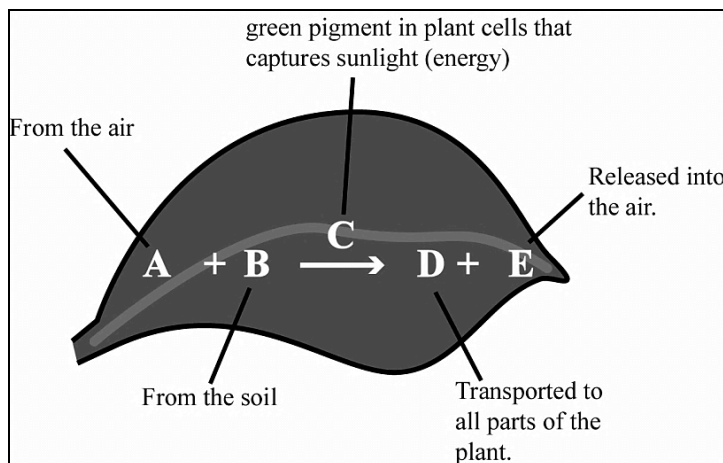


Which test tube I, II, III or IV is likely to produce a sound with the highest pitch?

QUESTION 40

Green plants produce their own food through the process of photosynthesis. The figure below illustrates the chemical reaction that occurs in plant leaves during photosynthesis.

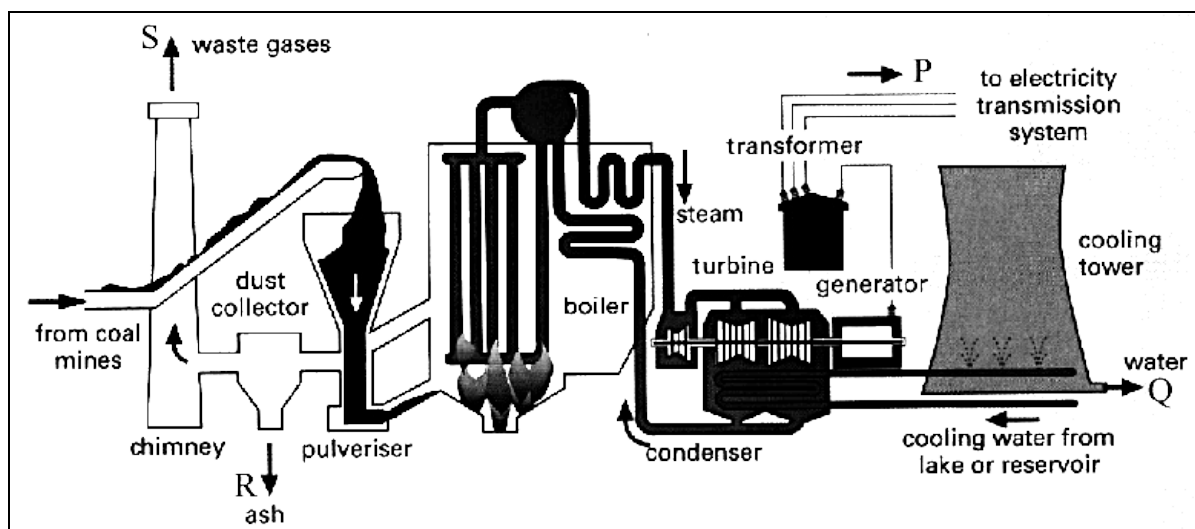
The products produced during photosynthesis and the substances needed for photosynthesis to occur are given by the letters A, B, C, D and E.



What substance is represented by the letter B?

For Questions 41, 42 and 43, refer to the following information.

The diagram below shows the layout of a power station where electricity is produced.



QUESTION 41

What is the name of the fossil fuel used in this power station?

QUESTION 42

According to the diagram, what drives the turbines that produce electricity?

QUESTION 43

Carbon dioxide is one of the harmful gases that result from this method of electricity production.

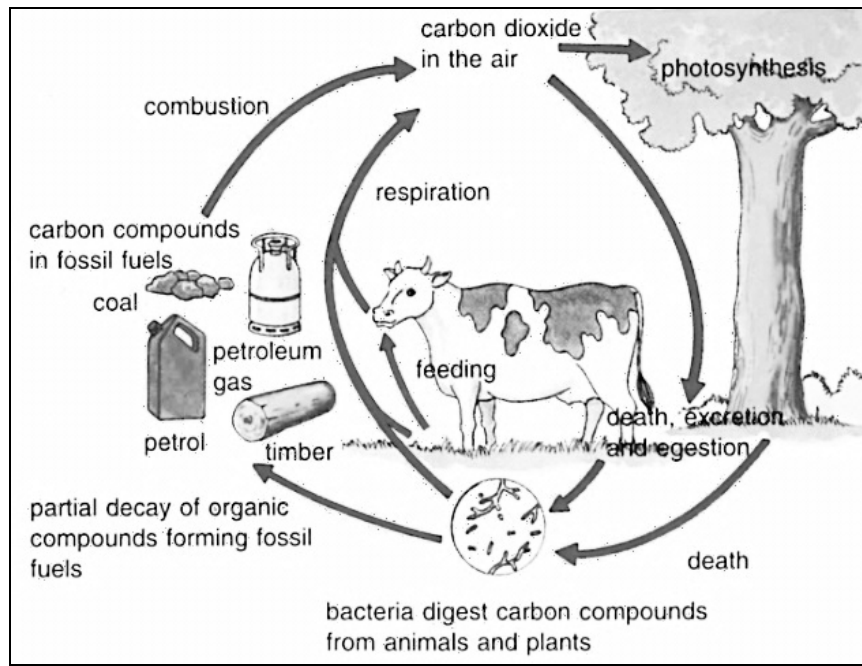
At which point P, Q, R or S in the diagram would carbon dioxide be released to the atmosphere?

QUESTION 44

Name the part of the electromagnetic spectrum that doctors use to examine bone fractures.

QUESTION 45

The diagram below shows a natural cycle.



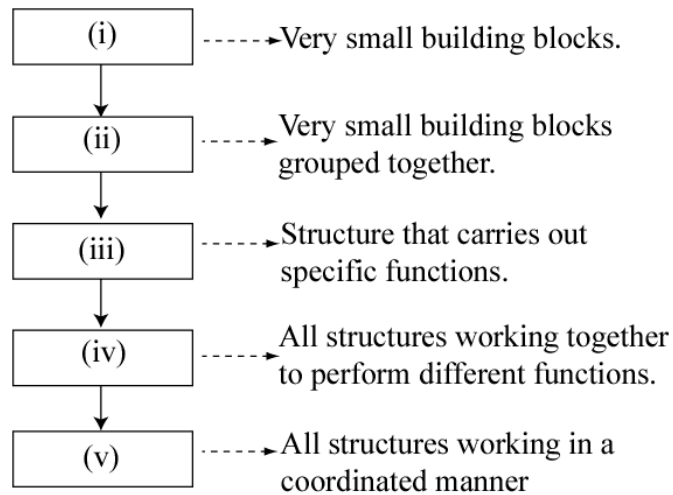
What is the name of the natural cycle illustrated above? _____ cycle.

PART C: EXTENDED RESPONSE**5 MARKS****QUESTION 46**

The diagram below shows the level of organization of the human body.

Choose the correct word from the list complete the diagram.

WORDS: *Tissues, Systems, Organisms, Organs, Cells*



END OF EXAMINATION

SCIENCE - ANSWER SHEET



MARKER 1

YEAR		PROV.		SCHOOL			CAND No.		
1	5								
NAME									
SCHOOL									

PART A: (Questions 1 to 25)

Write the letter of your answer next to each question below.

1		6		11		16		21	
2		7		12		17		22	
3		8		13		18		23	
4		9		14		19		24	
5		10		15		20		25	

PART B (Questions 26 to 45)

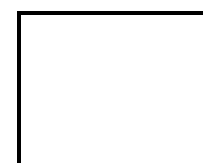
Write your answer next to each question below.

26		31		36	
27		32		37	years
28		33		38	
29	atoms	34	mm	39	
30		35		40	

PART C (Questions 46 to 50)

Write your answer next to each question below.

41		46	i.	
42			ii.	
43			iii.	
44			iv.	
45	cycle		v.	



MARKER 2

DO NOT WRITE ON THIS PAGE

YOU MAY DO YOUR ROUGH WORK ON THIS PAGE

CAREFULLY TEAR ALONG THIS PERFORATION

YOU MAY DO YOUR ROUGH WORK ON THIS PAGE