



DEPARTMENT OF
EDUCATION

LOWER SECONDARY
SCHOOL CERTIFICATE
EXAMINATIONS

SCIENCE

Tuesday

11 October 2011

Time allowed: 3 hours

8:00 am – 11:00 am

Candidates are advised to
fully utilise the time allocated

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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 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.

Write your candidate number, name and school name in the space given on the **Answer Sheet**.

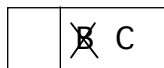
For each question in **PART A** choose the best answer and write its **LETTER** in the space given on the Answer Sheet.

For each question in **PART B and C** work out the answer and write the answer in the space given on the **Answer Sheet**.

If you find a question very difficult, do not spend too much time thinking about it. Skip the question and go on with the rest of the paper. If you have time at 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.

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

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

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

For each question, choose the best answer by writing A, B, C or D in the space provided on the ANSWER SHEET.

QUESTION 1

Which of these organs belong to the digestive system?

- A. pancreas B. kidney C. heart D. bladder

QUESTION 2

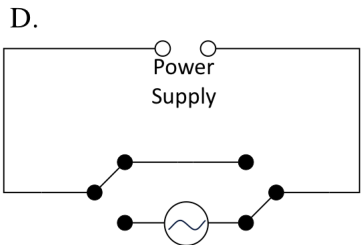
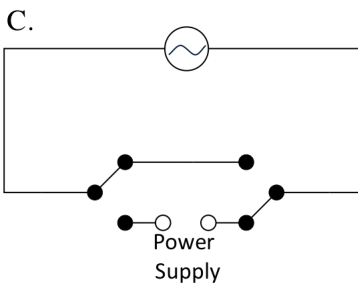
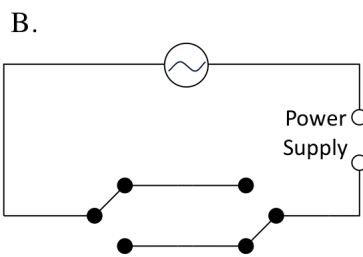
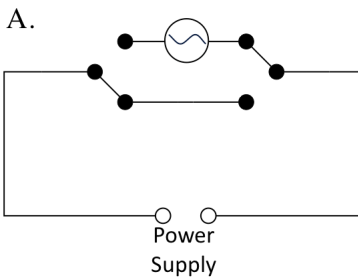
The chamber of heart that pumps blood to the rest of the body is called the

- A. right atrium B. left atrium C. right ventricle D. left ventricle

QUESTION 3

In household electrical wiring it is possible to use two switches to control the same lamp. In such circuits, each switch can be used to turn on and off the same lamp. The diagram shows the symbol of such a switch.

Which circuit below would allow the light to be turned on and off from both switches?



QUESTION 4

The study of the relationship of plants and animals with their natural environment is called

- A. botany B. biology C. zoology D. ecology

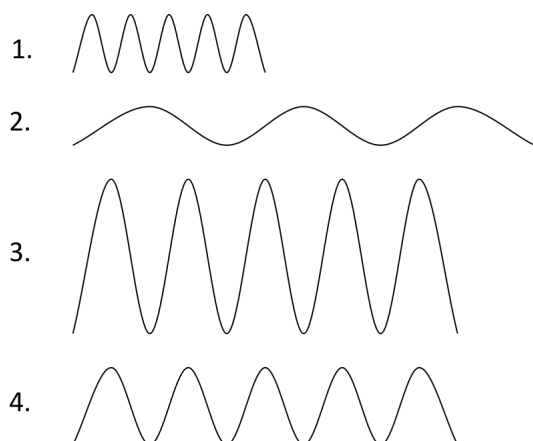
QUESTION 5

The protection of internal organs is among the functions of which body system?

- A. muscular B. circulatory C. skeletal D. nervous

QUESTION 6

The diagrams show four different traces of electromagnetic waves as recorded on an oscilloscope.



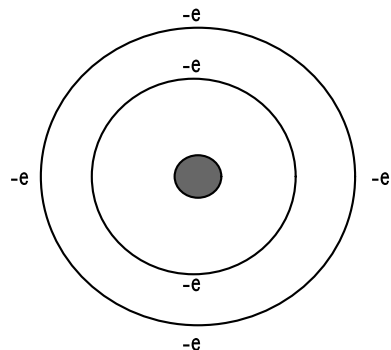
Which wave diagram represents the **loudest sound**?

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

QUESTION 7

The diagram shows the structure of an atom.

To which group and period of the Periodic Table does the atom of the element belong?



- A. Group II and Period 6 B. Group III and Period 3
 C. Group II and Period 4 D. Group IV and Period 2

QUESTION 8

What energy changes take place inside an incandescent light bulb?

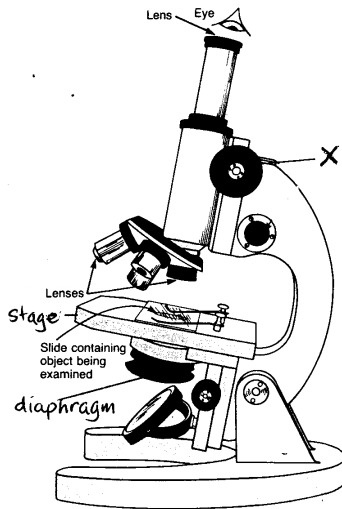
- A. chemical → heat → light
 B. chemical → electrical → light
 C. electrical → heat → light
 D. electrical → light → heat

QUESTION 9

Which of the following carbohydrates cannot be digested by our digestive system?

- A. sugar B. starch C. cellulose D. glucose

For Questions 10 and 11, refer to the diagram of a compound microscope.



QUESTION 10

What is the name of the part labelled X?

- A. fine adjustment knob B. coarse adjustment knob
C. condenser focus knob D. revolving nose piece

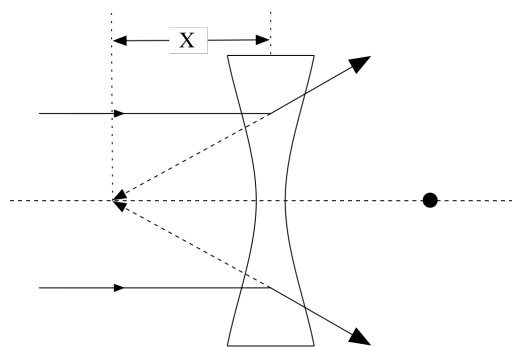
QUESTION 11

What is the proper way to hold or carry a microscope? Use one hand to

- A. hold the body tube and lift the stage with the other hand.
B. lift the stage and hold the arm by the other hand.
C. hold the arm and lift the base with the other hand.
D. lift the base and hold the body tube with the other hand.

QUESTION 12

The diagram below shows the light passing through a concave lens.



What does “X” in the diagram represent?

- A. Principal focus
- B. Light rays
- C. Focal length
- D. Incident ray

QUESTION 13

What is the main energy change that occurs in green plants during photosynthesis?

- A. chemical to mechanical
- B. chemical to kinetic
- C. light to chemical
- D. light to kinetic

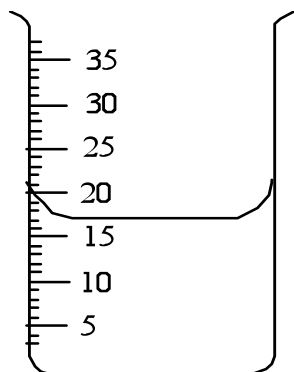
QUESTION 14

The relationship between a dog and a flea is called a _____ relationship.

- A. predator-prey
- B. mutuality or symbiotic
- C. parasitic
- D. communalistic

QUESTION 15

What is the correct reading from the volume of water in the beaker that is shown in the diagram below?



- A. 21 ml
- B. 20 ml
- C. 17 ml
- D. 15 ml

QUESTION 16

Which is the visible part of the electromagnetic spectrum?

- A. x-rays B. light waves C. radio waves D. ultra violet rays

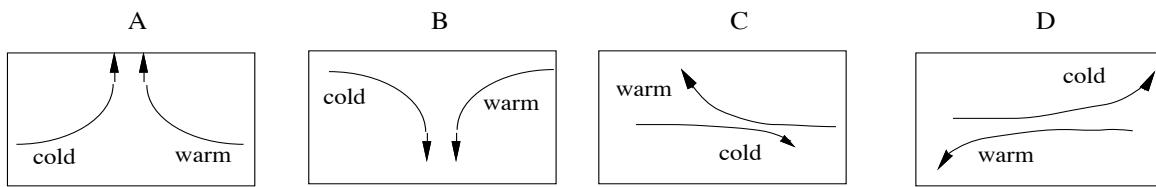
QUESTION 17

Which chemical equation shows the reaction between sodium hydroxide (NaOH) and sulphuric acid (H₂SO₄)?

- A. $\text{NaOH} + \text{H}_2\text{SO}_4 \Rightarrow \text{Na}_2\text{SO}_4 + \text{H}_2\text{O}$
 B. $2\text{NaOH} + \text{H}_2\text{SO}_4 \Rightarrow \text{Na}_2\text{SO}_4 + 2\text{H}_2\text{O}$
 C. $\text{NaOH} + 2\text{H}_2\text{SO}_4 \Rightarrow 2\text{Na}_2\text{SO}_4 + \text{H}_2\text{O}$
 D. $2\text{NaOH} + \text{H}_2\text{SO}_4 \Rightarrow 2\text{Na}_2\text{SO}_4 + \text{H}_2\text{O}$

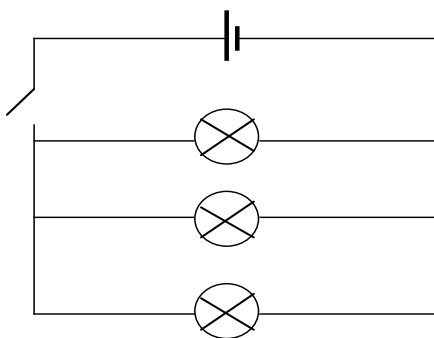
QUESTION 18

Warm air is moving towards cold air. What will happen to the air at the place where they meet?



QUESTION 19

What happens to the brightness of the lamps as the number of lamps is increased in this type of circuit? The lamps are identical.



- A. increases B. decreases
 C. stays the same D. increases then decreases

QUESTION 20

Which of these following electrical symbols show a fuse?

- A. B. C. D. D.

QUESTION 21

Which of these following is a defect of vision that can NOT be corrected?

- A. colour blindness B. long sightedness C. short sightedness D. astigmatism

QUESTION 22

In the electromagnetic spectrum, a wave that has a high frequency will have a low

- A. speed B. wavelength C. amplitude D. period

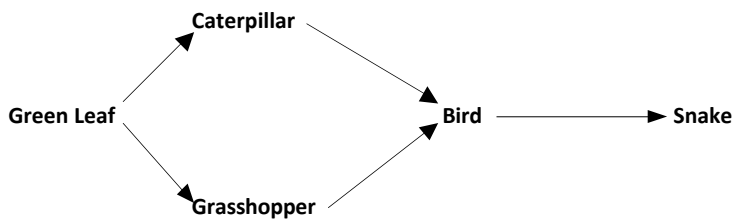
QUESTION 23

Which blood vessel carries oxygenated blood only?

- A. pulmonary artery B. vena cava C. aorta D. capillaries

QUESTION 24

Study the food web below.

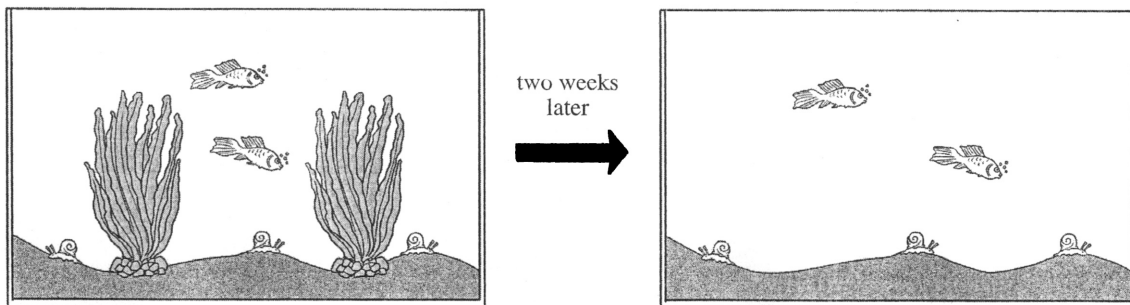


A sudden increase in the population of caterpillars would result directly in a

- A. rise in the number of green leaves.
B. fall in the number of grasshoppers.
C. fall in the number of snakes.
D. rise in the number of birds.

QUESTION 25

An aquarium was set up as shown below.



After two weeks, all the animals in the tank show signs of distress. What is the abiotic factor that may have caused the distress?

- A. insufficient oxygen B. high temperature
C. insufficient carbon dioxide D. excess light

END OF PART A

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

Write your answer in the spaces provided on the ANSWER SHEET.

For question 26 and 27 refer to the Periodic Table.

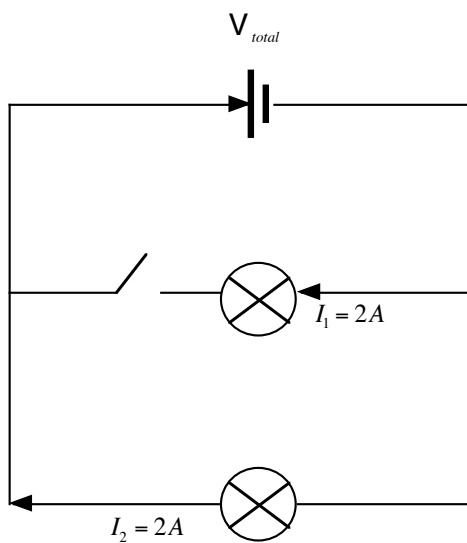
		GROUPS																						
		I	II											III	IV	V	VI	VII	VIII					
PERIODS	1	H																						He
	2	Li	Be											B	C	N	O	F	Ne					
	3	Na	Mg	←----- Transition metals -----→										Al	Si	P	S	Cl	Ar					
	4	K	Ca	Sc	Ti	V	Cr	Mn	Fe	Ni	Co	Cu	Zn	Ga	Ge	As	Se	Br	Kr					
	5	Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe					
	6	Cs	Ba	La	Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi	Po	At	Rn					
	7	Fr	Ra	Ac																				

QUESTION 26What is the **chemical formula** for Barium Chloride?**QUESTION 27**

How many electrons would the atomic structure of Tin have in its outer shell?

QUESTION 28

Refer to the diagram and information below.



What is the total voltage of the battery if the total resistance is 1.5A?

QUESTION 29

Which type of mirror is used in the reflector of a torch?

QUESTION 30

A teacher stood at the finishing line of a 100 metre race with a stopwatch and a starting pistol. He fired the pistol and started the stop watch at the same time. The students started to run and when the winner crossed the finishing line the stop watch showed the time as 11.9 seconds.

Sound travels 100 metres in 0.3 seconds.

What is the *actual time in seconds*, taken by the winner to run 100 metres?

QUESTION 31

A survey was done on five different rivers. The table below shows the bacterial count, oxygen level, numbers of plants and fish in each river.

River	Bacterial Count	Oxygen level	Number of plants	Number of fish
M	Low	Low	Many	Few
N	Low	High	Many	Many
O	High	High	Few	Many
P	High	High	Few	Few
Q	High	Low	Few	Few

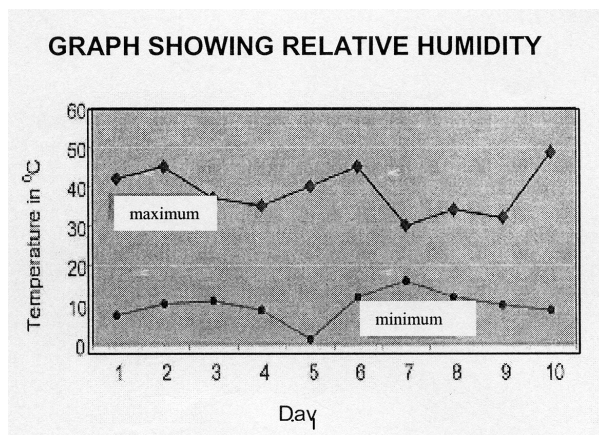
Which river is most polluted?

QUESTION 32

The equation for calculating the speed of a wave is; $\text{Wave speed(m/s)} = \text{frequency(Hz)} \times \text{wavelength(m)}$

If a wave has a frequency of 20 Hz and a speed of 340 m/s in air, what will be the wavelength in metres of the wave?

For Questions 33 and 34, refer to the following information.



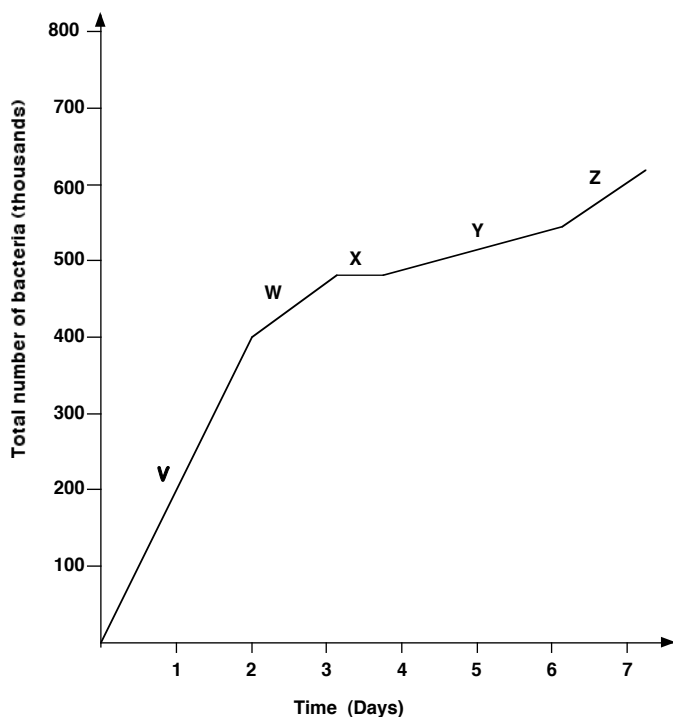
QUESTION 33

Which day had the lowest temperature?

QUESTION 34

What was the highest maximum temperature?

For Questions 35 and 36, refer to the graph.



QUESTION 35

Which letter indicates the period of fastest growth?

QUESTION 36

Which letter indicates the period of no growth?

For Questions 37 and 38, use the words in the list below to complete the sentence.

plasma, parasitism, cartilage, haemoglobin, mutualism, tendons, melanin, ligaments, leucocytes

QUESTION 37

What is the name of the colour pigment that gives blood its red color?

QUESTION 38

What is the name of the fibres that help attach bones to muscles?

For Questions 39 and 40, refer to the following information.

Electrical energy and the cost of electrical energy consumed are calculated as follows;

Electrical energy (kW-hr) = Power (kW) x Time (h)

Cost of Electrical Energy consumed = Electrical Energy x cost per kW-hr

QUESTION 39

If it takes a 3000 watt electric oven to roast a pig in 120 mins, how many kilowatt – hours (kWh) of energy will be consumed?

QUESTION 40

If 12 kilowatt-hour (kWhr) of energy is used to roast 2 pigs and the total cost for energy consumed is K4.80 than what is the cost per kilowatt-hour of energy?

QUESTION 41

What is the term used to describe the different populations that live in the habitat?

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

The following is a list of the types of micro-organism.

- I. Algae
- II. Fungi
- III. Bacteria
- IV. Protozoa
- V. Viruses

QUESTION 42

Which of these microorganisms causes the disease syphilis?

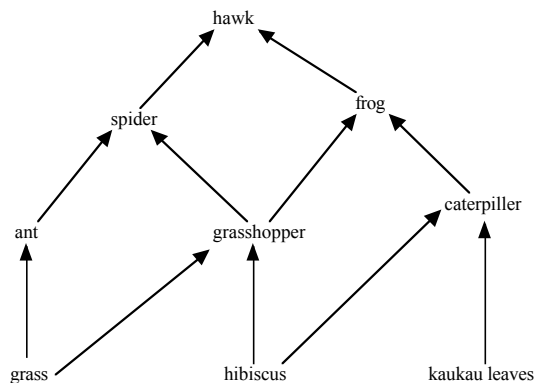
- A. II
- B. III
- C. IV
- D. V

QUESTION 43

Which of these organisms is the source of penicillin?

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

Questions 44 and 45 refer to the food web



QUESTION 44

Which first order consumer will be most affected if its food source is wiped out?

QUESTION 45

How many food chains are found in this food web?

PART C: EXTENDED RESPONSE

QUESTION 46

- (i) Choose the correct chemical formulae from the list given below and place in the blank spaces so that a chemical equation representing **photosynthesis** is formed. (4 marks)
- (ii) Balance the chemical equation. (1 mark)

CO₂, C₆H₁₂O₆, O₃, CO₃, O₂, OH, C₂H₄, and H₂O



END OF EXAMINATION

LOWER SECONDARY
SCHOOL CERTIFICATE EXAMINATION – 2011

SCIENCE – ANSWER SHEET

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MARKER 1

YEAR		PROV.		SCHOOL			CAND No.		
1	1								
NAME									
SCHOOL									

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MARKER 2

PART A: (Question 1 to 25)

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

1	
2	
3	
4	
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21	
22	
23	
24	
25	

PART B (Question 26 to 45)

Write your answer next to each question number below.

26	
27	
28	volts
29	
30	sec

31	
32	meters
33	
34	°C
35	

36	
37	
38	
39	kWhr
40	toea

41	
42	
43	
44	
45	

PART C (QUESTION 46)

Write the correct formula for photosynthesis and balance the equation.



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