



GAUTENG PROVINCE
EDUCATION
REPUBLIC OF SOUTH AFRICA

**GAUTENG DEPARTMENT OF EDUCATION
PROVINCIAL EXAMINATION
JUNE 2017
GRADE 9**

NATURAL SCIENCES

TIME: 2 hours

MARKS: 100

13 pages + 1 data sheet

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INSTRUCTIONS AND INFORMATION

1. Write your name and class on the first page of the ANSWER BOOK provided.
2. Answer all questions in the ANSWER BOOK.
3. This question paper consists of SECTION A, SECTION B and SECTION C based on the prescribed content framework in the CAPS document.
4. Allocation of marks:

SECTION A: 20
SECTION B: 42
SECTION C: 38
5. This examination paper consists of eleven questions.
6. Follow the instructions of each question.
7. All drawings should be done in pencil and labelled in blue or black ink.
8. Write neatly and legibly.

SECTION A

ANSWER **ALL** QUESTIONS IN THE ANSWER BOOK

QUESTION 1**MULTIPLE-CHOICE QUESTIONS**

Various options are provided as possible answers to the following questions. Choose the correct option and make a cross over the correct letter A, B, C or D next to the question number in your ANSWER BOOK.

- 1.1 The cell organelle where food is manufactured is the ...
- A nucleus.
 - B mitochondrion.
 - C chloroplast.
 - D cell membrane. (1)
- 1.2 The smallest blood vessels in the circulatory system are the ...
- A capillaries.
 - B veins.
 - C arteries.
 - D nodes. (1)
- 1.3 The tube that transports urine from the kidney to the bladder is the ...
- A urethra.
 - B aorta.
 - C ureter.
 - D oesophagus. (1)
- 1.4 The cells in sense organs that detect stimuli from the environment are the ...
- A nerves.
 - B effectors.
 - C receptors.
 - D impulses. (1)

1.5 Which one of the following shows pH values arranged from the most acidic to the least acidic?

- A 6 : 4 : 2 : 1
- B 1 : 4 : 2 : 6
- C 6 : 2 : 1 : 4
- D 1 : 2 : 4 : 6

(1)

1.6 How many atoms are present in three molecules of potassium carbonate (K_2CO_3)?

- A 12
- B 8
- C 18
- D 6

(1)

1.7 An orange solid formed by the reaction of iron and oxygen in the presence of water is known as ...

- A combustion.
- B galvanising.
- C rust.
- D electroplating.

(1)

1.8 The symbol for Iron is ...

- A I.
- B Ir.
- C Fe.
- D Fn.

(1)

[8]

QUESTION 2**TERMINOLOGY**

Give the correct **scientific term** for each of the following descriptions. Write only the term next to the question number (2.1 – 2.6) in the ANSWER BOOK.

- 2.1 A statement or possible explanation for an investigation (1)
- 2.2 Products formed when a metal reacts with oxygen (1)
- 2.3 The functional unit of all living organisms (1)
- 2.4 Coating iron with more reactive metal to protect it from rusting (1)
- 2.5 The ability to move from one place to another (1)
- 2.6 Air sacs where gaseous exchange takes place (1)
- (6)**

QUESTION 3**MATCHING ITEMS**

Choose an item from **COLUMN B** that matches a statement in **COLUMN A**. Write only the letter (A – H) next to the question number (3.1 – 3.6) in the ANSWER BOOK, for example 3.7 I.

COLUMN A	COLUMN B
3.1 Controls the amount of light passing through the microscope	A. Excretory system
3.2 Removes wastes from the body and regulates the body's fluids	B. Menstruation
3.3 Forms a milky solution when bubbled through limewater	C. Oxide
3.4 A compound formed when a substance reacts with oxygen	D. Products
3.5 Monthly bleeding when the lining of the uterus is shed	E. Diaphragm
3.6 New substances that form in a chemical reaction	F. Ovulation
	G. Non-metal
	H. Carbon dioxide gas

(6)
TOTAL SECTION A: [20]

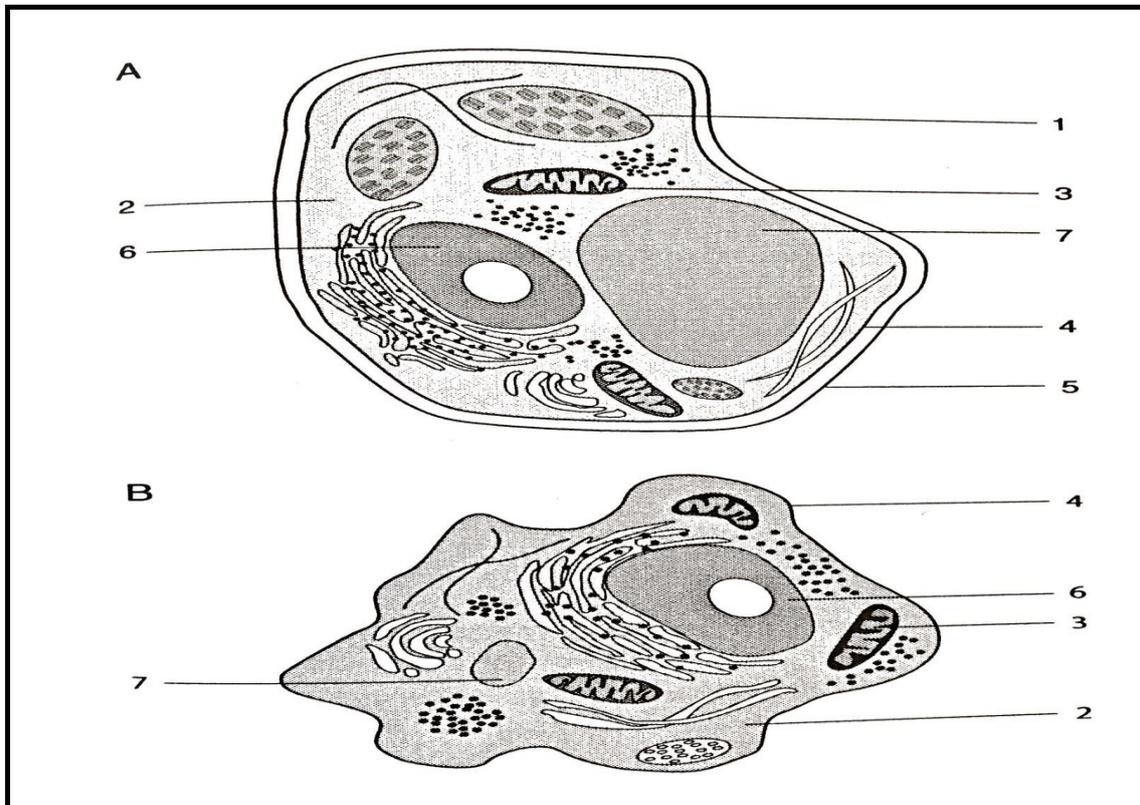
SECTION B

LIFE AND LIVING THINGS

QUESTION 4

CELLS AS BASIC UNITS OF LIFE

Study the following structures and answer the questions that follow.

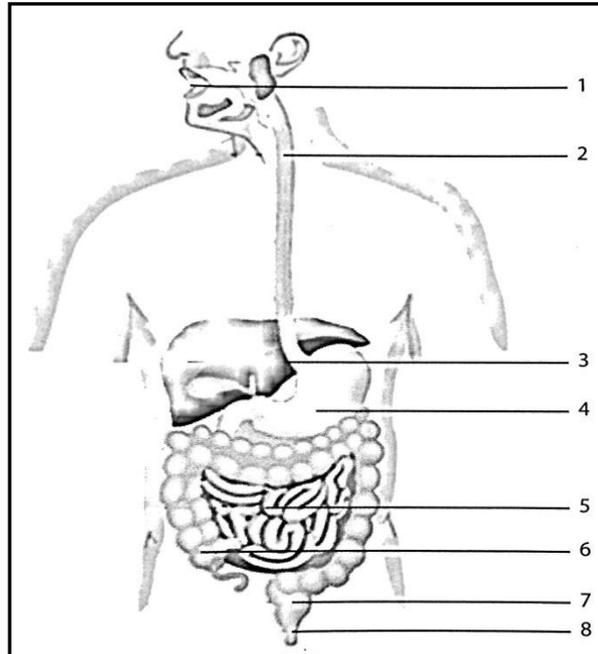


- 4.1 Identify structure A and structure B. (2)
- 4.2 Provide labels for the parts numbered 1 and 7 in structure A. (2)
- 4.3 Give the function of the part numbered 5 in structure A. (1)
- 4.4 Provide labels for parts numbered 3 and 6 in structure B. (2)
- 4.5 Give the function of the part numbered 1 in structure A. (1)
- 4.6 Tabulate TWO ways in which structure A differs from structure B. (2)
- 4.7 Name the organelle in plant and animal cells that contains the cell's DNA. Explain why DNA is important to the cell. (3)

(13)

QUESTION 5**SYSTEMS IN THE HUMAN BODY**

Study the diagram below and answer the questions that follow.



- 5.1 Supply labels for the parts numbered 2 and 5. (2)
- 5.2 Explain what happens to the glucose that is stored in the muscle cells. (2)
- 5.3 State the process that takes place in parts numbered 1, 4, 6 and 8. (4)
- (8)**

QUESTION 6**BREATHING, GASEOUS EXCHANGE, CIRCULATION AND RESPIRATION**

Read the following case study and answer the questions that follow.

Main processes in the circulatory system:

Our circulatory system is actually made up of two systems that function together:

- *A short system that circulates blood between the lungs and the heart; and*
- *A much longer system that circulates blood from the heart throughout the body and back again.*

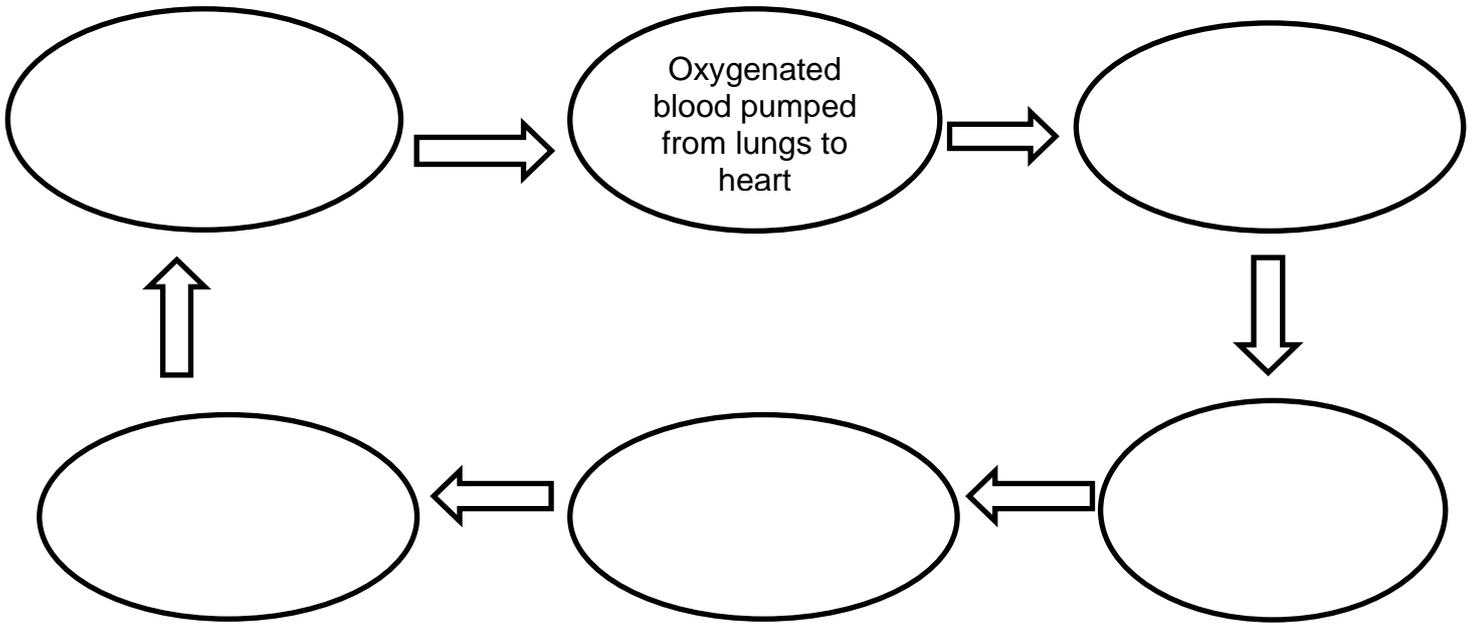
This process occurs as follows:

- *Blood is circulated from the heart to the lungs. At the lungs, carbon dioxide (CO₂) leaves the blood and oxygen (O₂) enters the blood. This process is known as **gaseous exchange**. Since the blood now contains more oxygen than carbon dioxide, we say it is oxygenated. This **oxygenated** blood returns to the heart.*
- *Once in the heart the oxygenated blood is then circulated to deliver the oxygen to all the cells in the body before returning to the heart. At the same time as it delivers oxygen, the blood also collects carbon dioxide from the cells. This blood has more CO₂ than O₂, so it is **deoxygenated** blood. The carbon dioxide is excreted when it next returns to the lungs.*

This process occurs over and over again throughout your life, thousands of times a day!

[Source: N S – SIYAVULA]
[GRADE 9 – FUNDED BY SASOL]

6.1 Use the provided information to complete the circular diagram below to show how blood travels through the circulatory system (composed of two systems).



(5)

6.2 Differentiate between *breathing* and *gaseous exchange*.

(2)

6.3 Compare the arteries and veins according to the headings given in the left column of the table.

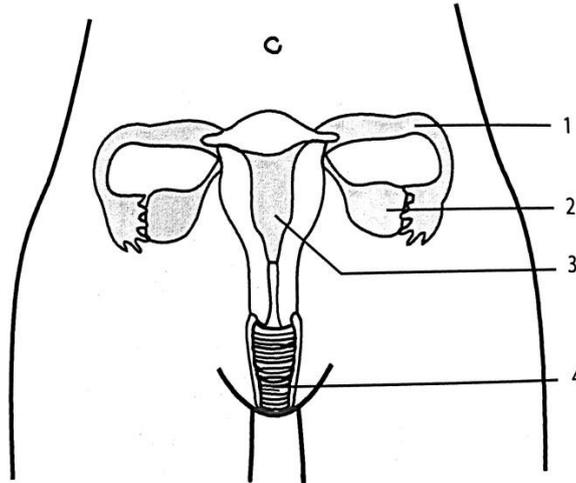
	ARTERIES	VEINS
Direction of blood flow		
Type of blood transported		
Thickness of walls		

(3)

(10)

QUESTION 7

THE REPRODUCTIVE SYSTEM



- 7.1 Give the number of the part where the egg cell is released. (1)
- 7.2 Give the number of the part where the sperm cell and the egg cell meet. (1)
- 7.3 A condom is a thin latex sheath that is used to cover the penis during sexual intercourse and prevents sperm from entering the female body.
- Explain TWO advantages of using condoms during intercourse. (2)
- 7.4 Read the following statement:
- “A girl can become pregnant the first time that she has sex.”*
- Is this statement true or false? Support your answer with reasons. (2)
- 7.5 Explain why pregnant mothers should not drink alcohol. (3)

(9)

TOTAL SECTION B: [40]

SECTION C**MATTER AND MATERIALS****QUESTION 8****PERIODIC TABLE, ELEMENTS AND COMPOUNDS**

Study the symbol $\left[\begin{matrix} 13 \\ 27 \end{matrix} \text{Al} \right]$ and use the periodic table provided to answer the questions below.

- 8.1 Name the element that this symbol represents. (1)
- 8.2 Give the element's mass number. (1)
- 8.3 Give the element's atomic number. (1)
- 8.4 Give the period number where this element is found. (1)
- 8.5 For what is this substance commonly used? (1)
- 8.6 Draw a labelled atomic structure to represent the element in your answer to Question 8.1. (5)
- 8.7 Use the symbols for elements to write formulae for the following compounds:
- 8.7.1 Ammonia with a ratio of one Carbon atom to three Hydrogen atoms (1)
- 8.7.2 Sodium Chloride with a ratio of one Sodium atom to one Chlorine atom (1)
- (12)**

QUESTION 9**ACIDS, BASES AND pH VALUES**

9.1 Vusi investigated the reaction between hydrochloric acid and sodium hydroxide solution. He puts 5 ml sodium hydroxide solution into a breaker and adds a few drops of universal indicator. He then adds hydrochloric acid slowly until he is sure that the pH of the solution is 7.

9.1.1 Predict the colour of the solution after he first added the universal indicator. Support your answer with a reason. (2)

9.1.2 Name the reaction that occurs between an acid and an alkali. (2)

9.1.3 Write a balanced chemical equation for the reaction. (2)

9.1.4 Suggest how Vusi would know when the pH was 7. (1)

9.1.5 In this reaction a salt is produced. Apply your knowledge to name the salt. (1)

9.1.6 Vusi wanted a dry sample of the salt produced after the reaction. Suggest how he would do this. (1)

9.2 Farmers need to know the pH of the soil to determine what crops they should grow. Look at the table showing different pH values at which some crop plants will grow.

pH	8	7.5	7	6.5	6	5.5	5	4.5
Crop	Beetroot Mint	Beetroot Mint	Carrot Lettuce Onions	Cauliflower Lettuce	Cauliflower	Potato	Potato	

9.2.1 In what pH range will potatoes grow well? (1)

9.2.2 If a soil had a pH range of 7.6 which crop could be grown? (1)

9.2.3 What can a farmer do if his soil has a pH of 4? (1)
(12)

QUESTION 10**REACTION OF NON-METALS WITH OXYGEN**

When carbon is burnt in air, a colourless gas called carbon dioxide is formed.

- 10.1 Give the word equation for the reaction of carbon in air. (2)
- 10.2 Give the chemical equation of the reaction. (2)
- 10.3 Draw the model / picture equation for this reaction. (3)
- (7)**

QUESTION 11**REACTION OF METALS WITH OXYGEN**

When magnesium is burnt in air it forms a white powder.

- 11.1 State the gas with which the magnesium reacts. (1)
- 11.2 Write down the name of this type of rapid chemical reaction that produces heat and light. (1)
- 11.3 Write the chemical equation of this reaction. (3)
- 11.4 Write down a balanced model / picture equation for the reaction. (4)
- (9)**

TOTAL SECTION C: [40]

TOTAL: 100

END

THE PERIODIC TABLE OF ELEMENTS / DIE PERIODIEKE TABEL VAN ELEMENTE

1 (I)	2 (II)	3	4	5	6	7	8	9	10	11	12	13 (III)	14 (IV)	15 (V)	16 (VI)	17 (VII)	18 (VIII)	
2,1 1 H 1																	2 He 4	
1,0 3 Li 7	1,5 4 Be 9											2,0 5 B 11	2,5 6 C 12	3,0 7 N 14	3,5 8 O 16	4,0 9 F 19	10 Ne 20	
0,9 11 Na 23	1,2 12 Mg 24											1,5 13 Al 27	1,8 14 Si 28	2,1 15 P 31	2,5 16 S 32	3,0 17 Cl 35,5	18 Ar 40	
0,8 19 K 39	1,0 20 Ca 40	1,3 21 Sc 45	1,5 22 Ti 48	1,6 23 V 51	1,6 24 Cr 52	1,5 25 Mn 55	1,8 26 Fe 56	1,8 27 Co 59	1,8 28 Ni 59	1,9 29 Cu 63,5	1,6 30 Zn 65	1,6 31 Ga 70	1,8 32 Ge 73	2,0 33 As 75	2,4 34 Se 79	2,8 35 Br 80	36 Kr 84	
0,8 37 Rb 86	1,0 38 Sr 88	1,2 39 Y 89	1,4 40 Zr 91		1,8 42 Mo 96	1,9 43 Tc 96	2,2 44 Ru 101	2,2 45 Rh 103	2,2 46 Pd 106	1,9 47 Ag 108	1,7 48 Cd 112	1,7 49 In 115	1,8 50 Sn 119	1,9 51 Sb 122	2,1 52 Te 128	2,5 53 I 127	54 Xe 131	
0,7 55 Cs 133	0,9 56 Ba 137	57 La 139	1,6 72 Hf 179	73 Ta 181	74 W 184	75 Re 186	76 Os 190	77 Ir 192	78 Pt 195	79 Au 197	80 Hg 201	1,8 81 Tl 204	1,8 82 Pb 207	1,9 83 Bi 209	2,0 84 Po	2,5 85 At	86 Rn	
0,7 87 Fr	0,9 88 Ra 226	89 Ac																
					58 Ce 140	59 Pr 141	60 Nd 144	61 Pm	62 Sm 150	63 Eu 152	64 Gd 157	65 Tb 159	66 Dy 163	67 Ho 165	68 Er 167	69 Tm 169	70 Yb 173	71 Lu 175
					90 Th 232	91 Pa	92 U 238	93 Np	94 Pu	95 Am	96 Cm	97 Bk	98 Cf	99 Es	100 Fm	101 Md	102 No	103 Lr

