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GAUTENG PROVINCE
EDUCATION
REPUBLIC OF SOUTH AFRICA

**GAUTENG DEPARTMENT OF EDUCATION
PROVINCIAL EXAMINATION**

**JUNE 2016
GRADE 9**

NATURAL SCIENCE

TIME: 90 minutes

MARKS: 80

13 pages + 1 information sheet

NATURAL SCIENCE**GRADE 9****2**

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INSTRUCTIONS AND INFORMATION

- 1 Write your surname, name and class on the ANSWER BOOK.
- 2 Answer all questions in the ANSWER BOOK provided.
- 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 [30]

SECTION C [30]
- 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.
- 9 The Periodic Table is attached at the end of the question paper.

SECTION A**ANSWER ALL QUESTIONS IN THE ANSWER BOOK.****QUESTION 1****MULTIPLE-CHOICE**

Various options are provided as possible answers to the following questions. Choose the correct option by circling, or placing a cross over the correct letter (A – D).

- 1.1 The material in a cell that carries hereditary information is called ...
- A hydrochloric acid.
 - B deoxyribonucleic acid.
 - C sulfuric acid.
 - D carbonic acid.
- (1)
- 1.2 The physical breaking down of food by crushing, mashing and churning is known as ...
- A absorption.
 - B mechanical digestion.
 - C egestion.
 - D chemical digestion.
- (1)
- 1.3 The following process is not a characteristic of life.
- A Photosynthesis
 - B Respiration
 - C Excretion
 - D Movement
- (1)
- 1.4 The random movement of particles from a region of high concentration to a region of low concentration, is called ...
- A respiration.
 - B diffusion.
 - C breathing.
 - D gaseous exchange.
- (1)
- 1.5 The removal of metabolic waste products from the body which takes place in cells in the form of urine, sweat and exhalation is known as ...
- A excretion.
 - B inhalation.
 - C digestion.
 - D absorption.
- (1)



1.6 The products that are formed when an acid reacts with metal are ...

- A salt and hydrogen.
- B salt and water.
- C salt and carbondioxide.
- D salt and oxygen.

(1)

1.7 Study the following equations and indicate the correct balanced equation.

- A $2\text{Na} + \text{H}_2\text{O} \rightarrow 2\text{NaOH} + \text{H}_2\text{O}$
- B $2\text{Na} + 2\text{H}_2\text{O} \rightarrow 2\text{NaOH} + \text{H}_2$
- C $\text{Na} + 2\text{H}_2\text{O} \rightarrow 2\text{NaOH} + \text{H}_2$
- D $2\text{Na} + \text{H}_2\text{O} \rightarrow 2\text{NaOH} + 2\text{H}_2$

(1)

1.8 New substances that are formed during a chemical reaction are called ...

- A atoms.
- B products.
- C sub-atomic particles.
- D reactants.

(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 your ANSWER BOOK.

- 2.1 The act of cutting something into parts for scientific examination (1)
- 2.2 Chemical substances that make food last longer (1)
- 2.3 A condition where bowel movements occur less frequently and consist of hard, dry stool (1)
- 2.4 A rapid, chemical reaction with O_2 that produces heat and light (1)
- 2.5 The smallest of the three sub-atomic particles that are negatively charged and are located outside the nucleus (1)
- 2.6 Organisms that are so small that they can only be seen when using a microscope (1)
- [6]**

QUESTION 3**MATCHING**

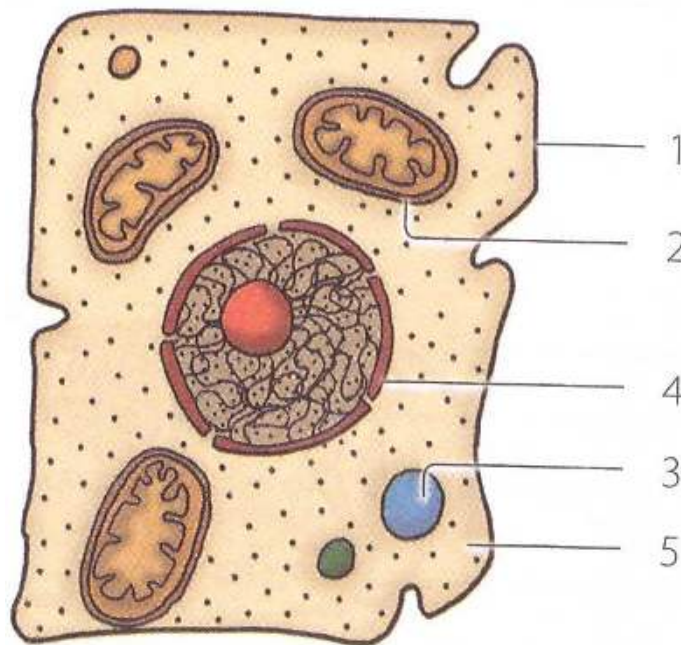
Choose an item from COLUMN B that matches a statement in COLUMN A. Write only the letter (A – H) next to the question number (3.1 – 3.6) in the ANSWER BOOK, for example: 3.7 J.

COLUMN A		COLUMN B	
3.1	The part of the microscope that controls the amount of light that enters	A	Tissue
3.2	A substance that changes colour in an acid and a base	B	Tendon
3.3	A group of cells that have a similar structure and that perform the same function	C	Compound
3.4	A pure substance which is formed by a chemical reaction between two or more different substances	D	Nerve cells
3.5	A tough inelastic tissue which attaches muscles to bones	E	Diaphragm
3.6	Specialised cells that carry messages which co-ordinate the functions of the body	F	Muscle cells
		G	Mixture
		H	Indicator

[6]**TOTAL SECTION A: 20**

SECTION B**LIFE AND LIVING****QUESTION 4****CELLS AS THE BASIC UNITS OF LIFE**

Study the following structure and answer the questions that follow.



- 4.1 Provide a suitable heading for a diagram above. (1)
- 4.2 Provide labels for Part 1 and Part 5. (2)
- 4.3 What is the function of the nucleus in a cell? (2)
- 4.4 Why are animal cells unable to make their own food? (1)
- 4.5 Tabulate TWO differences between a plant cell and an animal cell. (2)
- [8]**

QUESTION 5**SYSTEMS IN THE HUMAN BODY**

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

LOST IN THE DESERT

A man is lost in a desert. It is very hot and his body feels very warm. He sees an oasis with water and plants. He jumps into the water to cool his body. He is thirsty and drinks water.

He finds more plants. Some plants have fruit. He wants to eat the fruit, but he is not sure which plants are edible and which are poisonous. He knows that fruit or parts of plants that have a burning or irritating effect on his skin and mouth must be avoided.

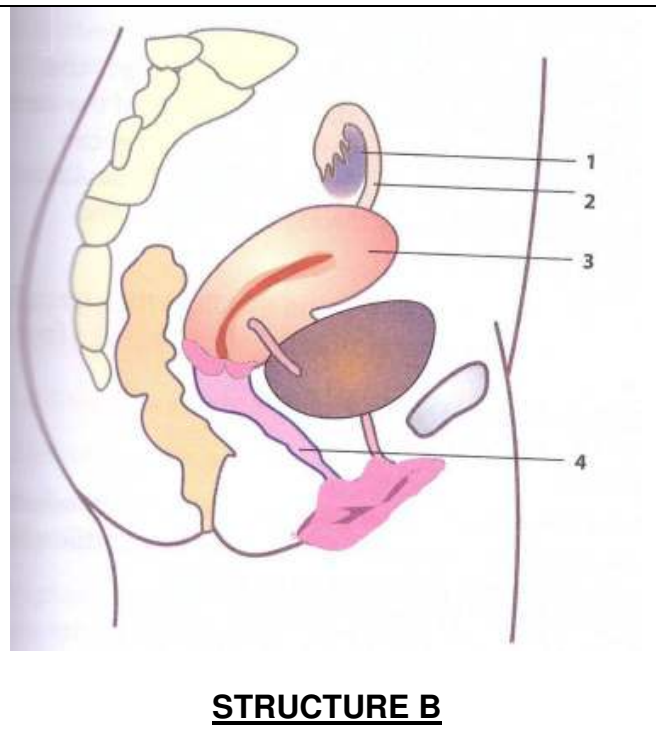
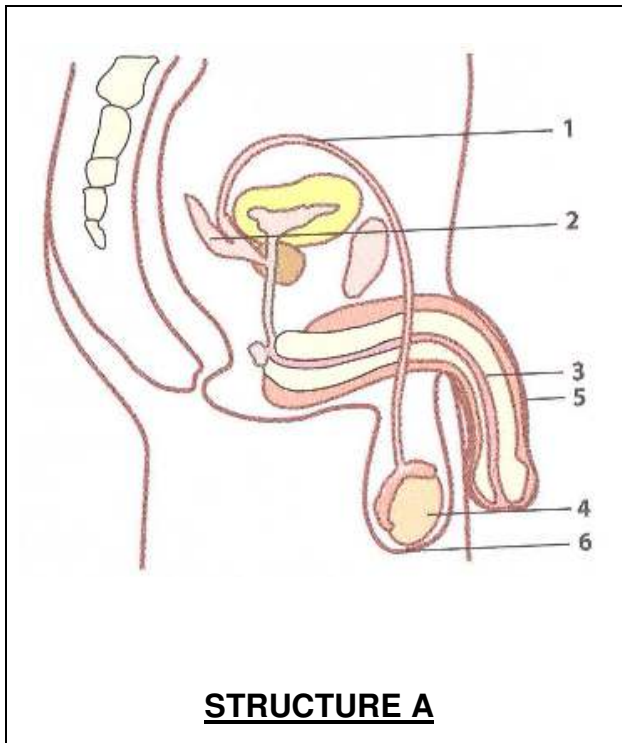
He goes to the shade of the palm trees. He picks the first fruit he sees and puts a small piece in his mouth. It has a bitter taste and his mouth is itching. The second fruit he picks is a prickly pear. The thorns of the fruit's skin hurt him. He takes a leaf from another plant and holds the prickly pear with the leaf. He uses a stone with a sharp edge to peel the skin. He smells the sweet flavor of the fruit and puts it into his mouth. He tastes the sweetness of the fruit.

He falls asleep in a cool place next to the water. After a while he is awakened by a thunderous noise. It is a helicopter looking for him. He runs to the open dunes and waves his arms. The pilot sees him and lands the helicopter.

- 5.1 Write down any TWO sense organs which play roles and the processes involved in each sense organ, while this man is lost in the desert. (4)
- 5.2 Give an example of the stimulus from the text which plays a role in each of the processes mentioned as answers to Question 5.1. (2)
- [6]**

QUESTION 6**THE HUMAN REPRODUCTIVE SYSTEM**

Study the following structures and answer the questions that follow.

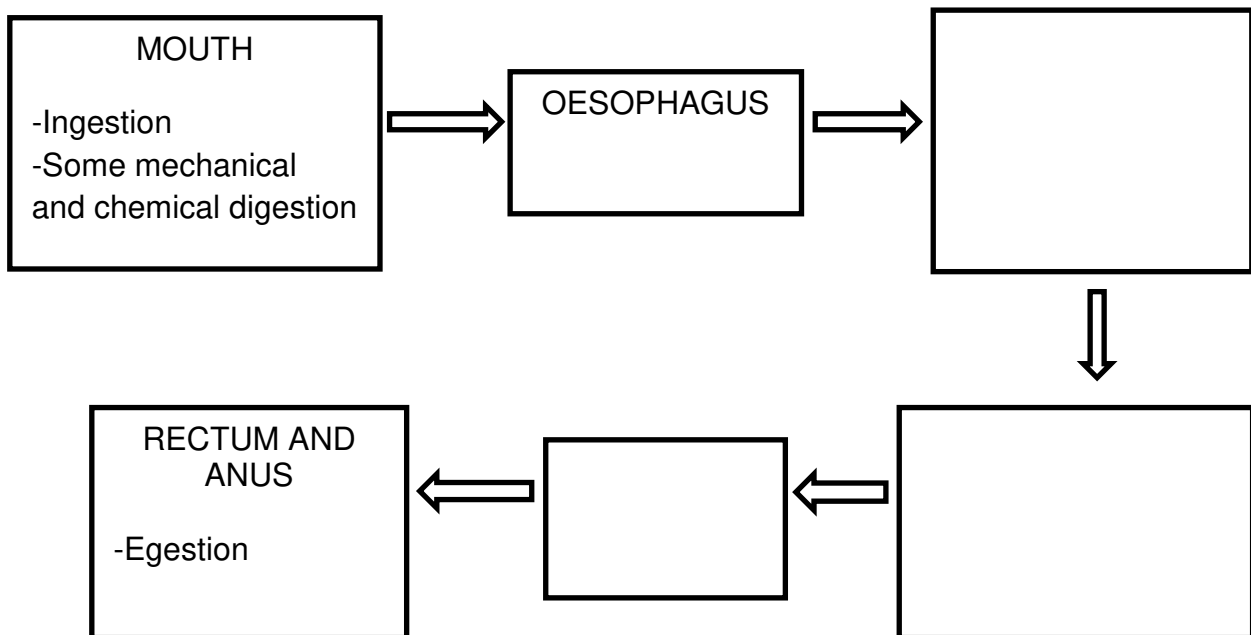


- 6.1 Identify Structure A and Structure B. (2)
- 6.2 Label the part marked 5 in Structure A. (1)
- 6.3 Give a reason why the testes hang outside the body. (2)
- 6.4 The part labelled 3 in Structure B is the uterus. What is its function? (1)
- 6.5 Label the part marked 1 in Structure B. (1)
- 6.6 In which part does fertilisation take place in Structure B. Give the number. (1)
- 6.7 Name the part mentioned in the answer to Question 6.6. (1)
- 6.8 Give ONE reason why condoms are a popular method of contraception. (1)

[10]

QUESTION 7**THE HUMAN DIGESTIVE SYSTEM**

Complete the following flow diagram that represents the passage of food from the time that it is taken into the body to the time that it is egested from the body. The blocks must show the main components and processes involved in digestion.



[6]

TOTAL SECTION B: 30

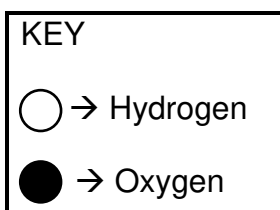
SECTION C**MATTER AND MATERIALS****QUESTION 8****THE PERIODIC TABLE**

Study the symbol $\left[\begin{smallmatrix} 16 \\ 8 \end{smallmatrix} \text{O} \right]$ and use the periodic table provided to answer the questions.

- 8.1 Name the element that the above symbol represents. (1)
- 8.2 Give the element's atomic number. (1)
- 8.3 Is the element a metal, a non-metal or a semi-metal? (1)
- 8.4 Write down the group number of the element in the periodic table. (1)
- 8.5 Write down the name of the compound formed when the element in your answer to Question 8.1 reacts with carbon. (1)
- 8.6 Draw a labelled atomic structure to represent the element in your answer to Question 8.1. (3)
- [8]**

QUESTION 9**CHEMICAL REACTIONS**

- 9.1 Hydrogen will react with oxygen to form the compound water. Use the key provided below to draw a picture model that represents the balanced chemical equation for the reaction.

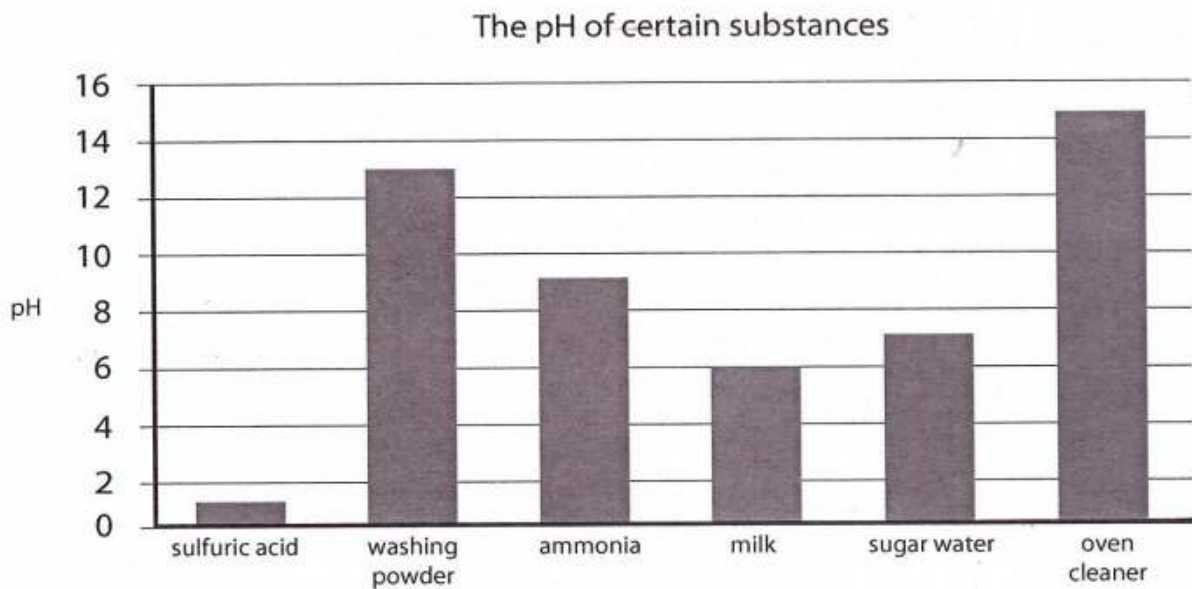


- 9.2 Write down the chemical equation for the reaction in your answer to Question 9.1. (3)
- 9.3 Balance the following chemical equation.



QUESTION 10**THE REACTION OF ACIDS AND BASES**

Consider the following graph.



- 10.1 What type of graph is represented above? (1)
- 10.2 Write down the substance with a pH of 7. (1)
- 10.3 What colour will this substance in Question 10.2 be on a universal indicator? (1)
- 10.4 Identify errors on the graph. (1)
- 10.5 Identify from the graph, all substances which are acids. Give a reason for each substance identified. (4)
- [8]**

QUESTION 11**REACTION OF ACIDS WITH METALS**

A piece of magnesium ribbon was placed into a flask which contained hydrochloric acid (HCl). The contents of the flask became warm and the gas was released.

The balanced chemical equation for the reaction is as follows:



11.1 Explain TWO ways which tell us that a chemical reaction was taking place. (2)

11.2 Asaf and Sonke investigated how the length of the magnesium ribbon would affect the amount of hydrogen gas produced. They thought that a longer piece would release more hydrogen gas. They carried out an experiment to find this out.

11.2.1 Write down the hypothesis for this investigation. (1)

11.2.2 Indicate the independent and dependent variables. (2)
[5]

TOTAL SECTION C: 30

TOTAL: 80

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)
1 2,1 H 1																	2 He 4
3 1,0 Li 7	4 1,5 Be 9											5 2,0 B 11	6 2,5 C 12	7 3,0 N 14	8 3,5 O 16	9 4,0 F 19	10 Ne 20
11 0,9 Na 23	12 1,2 Mg 24											13 1,5 Al 27	14 1,8 Si 28	15 2,1 P 31	16 2,5 S 32	17 3,0 Cl 35,5	18 Ar 40
19 0,8 K 39	20 1,0 Ca 40	21 1,3 Sc 45	22 1,5 Ti 48	23 1,6 V 51	24 1,6 Cr 52	25 1,5 Mn 55	26 1,8 Fe 56	27 1,8 Co 59	28 1,8 Ni 59	29 1,9 Cu 63,5	30 1,6 Zn 65	31 1,6 Ga 70	32 1,8 Ge 73	33 2,0 As 75	34 2,4 Se 79	35 2,8 Br 80	36 Kr 84
37 0,8 Rb 86	38 1,0 Sr 88	39 1,2 Y 89	40 1,4 Zr 91	41 Nb 92	42 1,8 Mo 96	43 1,9 Tc 98	44 2,2 Ru 101	45 2,2 Rh 103	46 2,2 Pd 106	47 1,9 Ag 108	48 1,7 Cd 112	49 1,7 In 115	50 1,8 Sn 119	51 1,9 Sb 122	52 2,1 Te 128	53 2,5 I 127	54 Xe 131
55 0,7 Cs 133	56 0,9 Ba 137	57 La 139	72 1,6 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	81 1,8 Tl 204	82 1,8 Pb 207	83 1,9 Bi 209	84 2,0 Po	85 2,5 At	86 Rn
87 0,7 Fr	88 0,9 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				

KEY/SLEUTEL

Atomic number

Atoomgetal

Electronegativity
ElektronegatiwiteitSymbol
SimboolApproximate relative atomic mass
Benaderde relatiewe atoommassa

END