Basic Education

KwaZulu-Natal Department of Basic Education
REPUBLIC OF SOUTH AFRICA

LIFE SCIENCES

COMMON TEST

MARCH 2016

NATIONAL SENIOR CERTIFICATE

GRADE 10

MARKS: 60

TIME: 1 hour

N.B. This question paper consists of 7 pages.

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INSTRUCTIONS AND INFORMATION

Read the following instructions carefully before answering the questions.

1. Answer ALL the questions.
2. Write ALL the answers in the ANSWER BOOK.
3. Start the answers to each question at the top of a NEW page.
4. Number the answers correctly according to the numbering system used in this question paper.
5. Present your answers according to the instructions of each question.
6. ALL drawings must be done in pencil and labelled in blue or black ink.
7. Draw diagrams, flow charts or tables only when asked to do so.
8. The diagrams in this question paper are NOT necessarily drawn to scale.
9. Do NOT use graph paper.
10. You must use a non-programmable calculator, protractor and a compass where necessary.
11. Write neatly and legibly.

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SECTION A

QUESTION 1

1.1 Various options are provided as possible answers to the following questions. Choose the correct answer and write only the letter (A to D) next to the question number (1.1.1 to 1.1.5) in your ANSWER BOOK, for example 1.1.6 D.

1.1.1 Which ONE of the following statements is TRUE about mitosis?

A A somatic cell divides to form two unidentical cells
B It forms cells to repair and replace worn out or damaged tissue
C The daughter cells formed have half the number of chromosomes as the mother cell
D It leads to the formation of gametes in humans

( )

1.1.2 The organelle that is responsible for packaging and secreting enzymes is the …

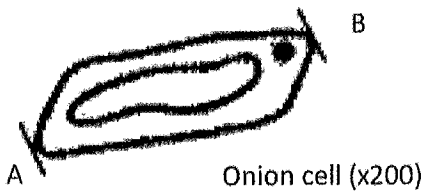
A mitochondrion.
B chloroplast.
C golgi body.
D endoplasmic reticulum.

1.1.3 When viewing a specimen the total magnification is 600x. If the magnification on the eyepiece is 10x then the magnification on the objective lens is…

A. 6x
B. 60x
C. 200x
D. 600x

( )

1.1.4 The actual size of the cell shown below when measured between points A and B is …



Onion cell (x200)

A 2 mm
B 0,2 mm
C 5 mm
D 20 mm

1.1.5 A scientist carried out an investigation on the rate of diffusion under three temperature conditions: 15°C, 25°C and 35°C.

Which ONE of the following statements applies to the above investigation?

A Temperature is the dependent variable
B A possible hypothesis is that an increase in temperature will lead to a decrease in the rate of diffusion
C The aim is to investigate whether the rate of diffusion has an effect on the temperature
D For the investigation to be valid, the temperature should be kept constant

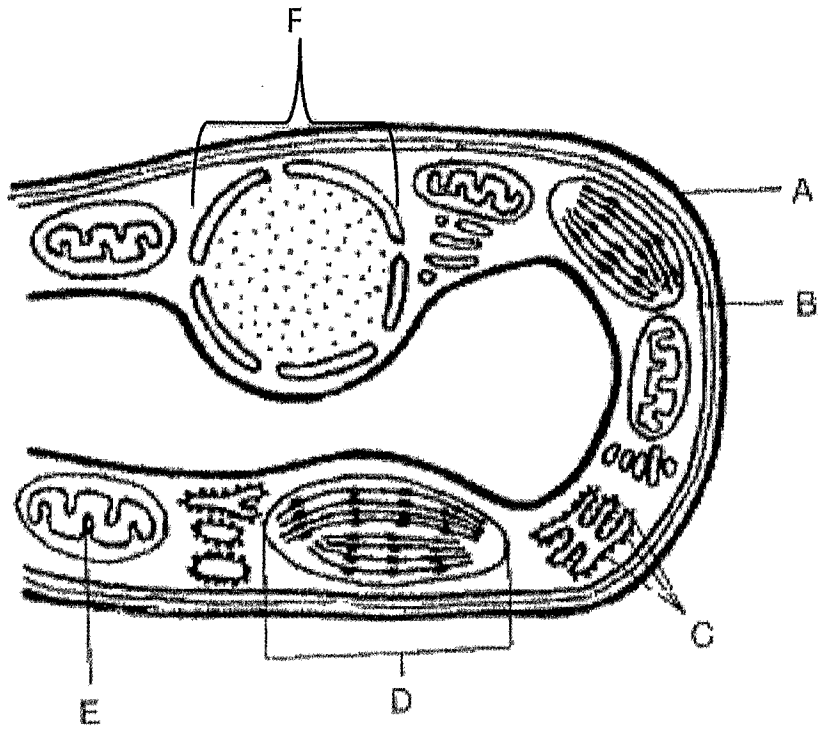
(5 x 2) **[10]**

TOTAL SECTION A: 10

SECTION B

QUESTION 2

2.1 The diagram below shows part of a cell as seen under an electron microscope.



2.1.1 Does the diagram represent a plant or animal cell? (1)

2.1.2 Give TWO visible reasons for your answer. (2)

2.1.3 Identify the small round structures **C**. (1)

2.1.4 Give ONE function of:

(a) Part **A**
(b) Part **D**. (2)

2.1.5 Explain ONE property of part **B** that helps it in carrying out its function. (2)

2.1.6 State what would happen if the part labelled **F** was removed from the cell. (1)

2.1.7 Explain why you would expect part **E** to be found in large numbers in muscle cells. (2)
(11)

2.2 Explain how the excess use of fertilisers may lead to eutrophication **(4)**
[15]

QUESTION 3

3.1 Read the passage below and answer the questions.

> Cells may begin to malfunction in the body. This results in cancer. This condition may be caused by cells dividing by mitosis in an uncontrolled manner. Abnormal number of cells may cause appearance of tumours (swellings of body parts). Tumours may be benign or malignant.
>
> Radiation from the sun may cause skin cancer. Tar in cigarette is carcinogenic and can cause lung cancer. Viruses are considered as the major cause of human cancer like cervical cancer and liver cancer. At present time certain diet and lifestyle increase risk of cancer. Cancer can be treated in different ways.

3.1.1 Name the disease that is caused by an uncontrolled cell division. (1)

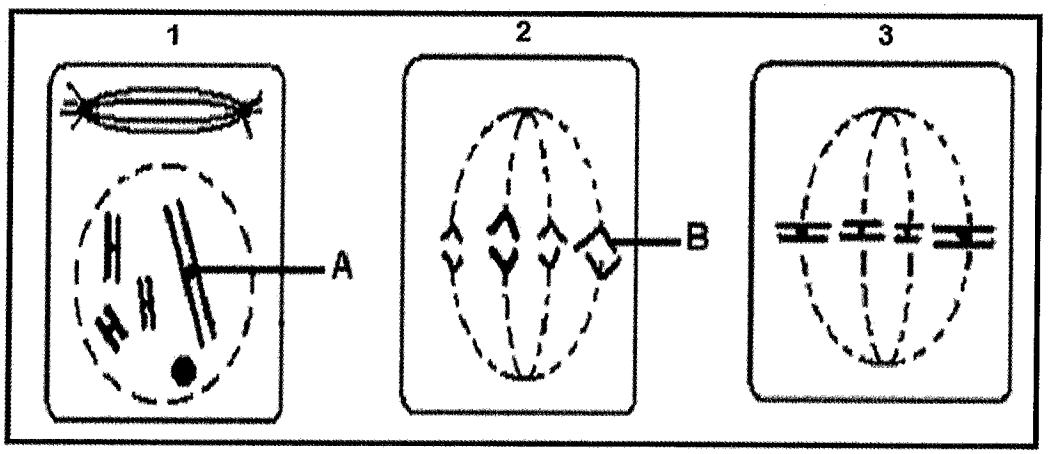
3.1.2 What term is used for substances that can cause cancer? (1)

3.1.3 From the passage, state the causes of the following types of cancer:

(a) Cervical cancer
(b) Skin cancer
(c) Lung cancer (3)
(5)

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3.2 Study the following diagrams representing different phases of mitosis.



3.2.1 Identify part **B**. (1)

3.2.2 State the function of part labelled **A**. (1)

3.2.3 Use the NUMBERS ONLY to arrange the phases of mitosis into the correct sequence from the above diagrams. (3)

3.2.4 How many chromosomes would be found in the daughter cells at the end of mitosis? (1)

3.2.5 Identify the phase of mitosis shown by diagram **3**. (1)

3.2.6 Give a reason for your answer in QUESTION 3.2.5. (2)

3.2.7 Name the phase of mitosis that is missing from the above diagrams. (1)
(10)

[15]

SECTION C

QUESTION 4

Organic compounds play an important role in the structure and functioning of a cell.

In this regard describe:

(a) The test for glucose in food items (5)
(b) The biological importance of lipids (3)
(c) THREE properties of enzymes (9)

Content: (17)
Synthesis: (3)

[20]

NOTE: NO marks will be awarded for answers in the form of flowcharts, tables or diagrams.

TOTAL SECTION C: 20
GRAND TOTAL: 60

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Grades 10 + 11

Basic Education

KwaZulu-Natal Department of Basic Education
REPUBLIC OF SOUTH AFRICA

LIFE SCIENCES

MEMORANDUM

COMMON TEST

MARCH 2016

NATIONAL SENIOR CERTIFICATE

GRADE 10

N.B. This memorandum consists of 4 pages including this page.

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SECTION A
QUESTION 1
1.1

1.1.1 B✓✓
1.1.2 C✓✓
1.1.3 B✓✓
1.1.4 B✓✓
1.1.5 B✓✓

(5 x 2) **(10)**

TOTAL SECTION A: 10

SECTION B
QUESTION 2
2.1

2.1.1 Plant Cell✓ (1)

2.1.2 Chloroplast present✓
One large vacuole present✓
Cell wall present✓
Mark first TWO only Any (2)

2.1.3 Ribosome✓ (1)

2.1.4 (a) Protection✓/Shape/Support/Allows entry of substances
(b) Photosynthesis✓ (2)

2.1.5 It is selectively permeable✓
and is thus able to control the movement of substances in and out of the cell✓/allow only certain substances to move through (2)

2.1.6 - Cell may die✓
- No control of cell activities✓
- No transmission of hereditary characteristics✓
- No protein synthesis✓ Any (1)

2.1.7 Mitochondria produce energy✓
A large amount of energy is required for muscle action✓ (2)
(11)

2.2 - Excess fertilisers drained into rivers✓/lakes/ dams
- Results in rapid growth of algae✓and other aquatic plants
- Algae prevents sunlight from reaching plants growing in deeper water✓
- Prevents photosynthesis✓ of other water plants
- Plants will die✓/rot
- Decomposing plants reduce oxygen in water✓
- Aquatic animals die✓ (any 4) (4)
(15)

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QUESTION 3

3.1

3.1.1 Cancer✓ (1)

3.1.2 Carcinogens✓ (1)

3.1.3 (a) Viruses✓
(b) Sun radiation✓
(c) Tar in cigarette✓/carcinogen (3)
(5)

3.2

3.2.1 Chromatid✓ (1)

3.2.2 Joins chromatids together✓ (1)

3.2.3 1✓- 3✓- 2✓ (3)

3.2.4 4✓ (1)

3.2.5 Metaphase✓ (1)

3.2.6 - Chromosomes arrange themselves along the equator✓ of the cell
- in a single✓ row (2)

3.2.7 Telophase✓ (1)
(10)
[15]

TOTAL SECTION B: 30

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SECTION C
QUESTION 4

(a) **Glucose test**
- Make a solution✓ of the unknown substance
- Add Benedict's Solution✓/Fehlings A and Fehlings B Solution
- Heat the solution✓ in a beaker
- If the solution turns green✓/yellow/orange
- then glucose is present✓
- If the solution remains blue✓
- then glucose is absent✓ (5)

(b) **Importance of lipids**
- Storage form of energy✓
- Act as packaging layer✓ between organs
- Serves as insulating layer✓ under the skin
- Components of cell membranes✓ Any (3)

(c) **Substrate specific✓**
- Specific enzyme acts on a specific substrate✓
- Its shape allows it to act✓ or fit in a specific substrate

Enzymes are sensitive to temperature changes✓
- At lower temperatures, enzyme is inactive✓
- At higher temperatures, enzyme becomes denatured✓

Enzymes are sensitive to pH changes✓
- There is an optimum pH at which they work best✓
- Enzymes denature when exposed outside its optimum pH range✓

(9)

Content (17)
Synthesis (3)

ASSESSING THE PRESENTATION OF THE ESSAY

RELEVANCE	LOGICAL SEQUENCE	COMPREHENSIVE
All information provided is relevant to the topic	Ideas arranged in a logical/ cause-effect sequence	Answered all aspects required by the essay in sufficient detail
Only information relevant to the glucose test, importance of lipids and properties of enzymes is given. There is no irrelevant information.	Ideas on all three items required are arranged in a logical sequence especially for the glucose test and the properties of enzymes	At least **3/5** points on the glucose test; **2/3** points on the importance of lipids and **6/9** points on the properties of enzymes, is given.
1 mark	1 mark	1 mark

TOTAL SECTION C: 20

GRAND TOTAL: 60

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