



**PAMIBIA UNIVERSITY
OF SCIENCE AND TECHNOLOGY**

FACULTY OF HEALTH AND APPLIED SCIENCES

DEPARTMENT OF HEALTH SCIENCES

QUALIFICATION : MEDICAL LABORATORY SCIENCES	
QUALIFICATION CODE: 08BMLS	LEVEL: 5
COURSE CODE: CMB521S	COURSE NAME: CELL AND MOLECULAR BIOLOGY
SESSION: NOVEMBER 2019	PAPER: THEORY
DURATION: 3 HOURS	MARKS: 100

FIRST OPPORTUNITY EXAMINATION	
EXAMINER(S)	Ms EDWIG HAUWANGA
MODERATOR:	Ms VANESSA TJIJENDA

INSTRUCTIONS
<ol style="list-style-type: none">1. Answer ALL the questions.2. Write clearly and neatly.3. Number the answers clearly.4. Graph paper included

THIS QUESTION PAPER CONSISTS OF 7 PAGES (Including this front page)

SECTION A (25 MARKS)

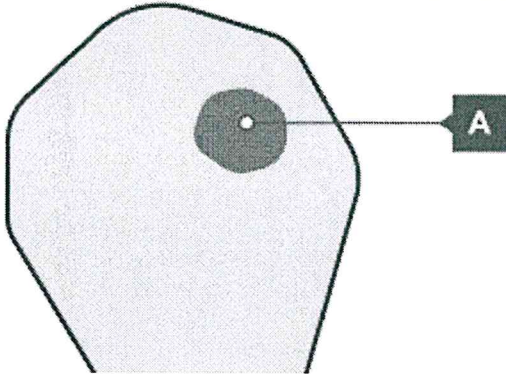
QUESTION 1

[15]

Evaluate the statements in each numbered section and select the most appropriate answer or phrase from the given possibilities. Write the appropriate letter next to the number of the statement/phrase.

1.1 What is the part of the animal cell labelled A?

(1)



- A) Vacuole
- B) Lysosome
- C) Nucleus
- D) Nucleolus

1.2 By which processes does glucose enter cells in the human body?

(1)

- A) Active Transport
- B) Osmosis
- C) Simple diffusion
- D) Facilitated diffusion

1.3 Identify the enzyme that also has proofreading functions.

(1)

- A) Helicase
- B) Primase
- C) RNA polymerase
- D) DNA Polymerase

1.4 Identify phase where replication of genetic material occurs.

(1)

- A) Interphase
- B) G2 phase
- C) S phases
- D) Cytokinesis

1.5 Which of the following statements are true about the G2 phase? (1)

- A) Cell is at rest
- B) Final stage before cell enters mitosis
- C) Stage where chromosomes are duplicated
- D) Each chromosome contains one DNA molecule

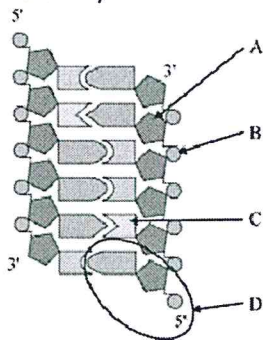
1.6 A sequence of DNA that codes for a molecule that has a function is known as a.... (1)

- A) Chromosome
- B) Genetic material
- C) Gene
- D) Genome

1.7 During base pairing, uracil binds with: (1)

- A) Thymine
- B) Guanine
- C) Adenine
- D) Cytosine

1.8 Identify D... (1)



- A) Nucleotide
- B) Phosphate
- C) Sugar
- D) Nitrogenous base

- 1.9 Which of the following is a stop codons? (1)
- A) CUU
 - B) UAA
 - C) AAU
 - D) CGU
- 1.10 Identify the RNA responsible for transfer of genes to ribosomes for protein synthesis? (1)
- A) sRNA
 - B) mRNA
 - C) rRNA
 - D) tRNA
- 1.11 An example of positive regulation of cell division would be? (1)
- A) G1 Checkpoint
 - B) G2Checkpoint
 - C) P53 gene
 - D) Cyclin depended kinases
- 1.12 Which of the following is not true about the lagging strand? (1)
- A) Runs from 5' to 3'
 - B) Has okazaki fragments
 - C) Is discontinuous
 - D) DNA polymerase runs along it from 5' to 3'
- 1.13 The function of the operon regulatory protein sigma..... (1)
- A) Bind to operator and inhibit transcription
 - B) Helps the RNA polymerase core enzyme recognize the promoter
 - C) Terminates transcription
 - D) Its controls the expression of genes adjacent to it
- 1.14 The microorganism widely used in transcription studies: (1)
- A) *Streptococcus spp*
 - B) *Staphylococcus ssp*
 - C) *Escherichi Coli*
 - D) *Salmonella ssp*

- 1.15 The cloverleaf contains.....non-base-paired *loops* (1)
- A) 1
 - B) 2
 - C) 3
 - D) 4

QUESTION 2 [10]

Fill in the following missing words:

- 1.1 Robert Hook discovered cells while.....invented the microscope and Mathias Schleiden (2)
discovered that.....were made of cells.
- 1.2 Cells differ significantly in size, shape, and (2)
(3)
- 1.3 You able to see the andof a cell using the But not organelles. (1)
(2)
- 1.4 Nucleus bounded in a nuclear envelope which contains
- 1.5 Functions as a manufacturing and packaging system. It works closely with the
Golgi apparatus and the

SECTION B (34 MARKS)

QUESTION 3

[18]

- 3.1 Compare and contrast the two important cytoskeletal machinery that plays a role in mitosis. (8)
- 3.2 For each of the following mitotic phases, state the shape and position of the genetic material (chromosomes). (10)
- Interphase
 - Prophase
 - Metaphase
 - Anaphase
 - Telophase

QUESTION 4

[16]

- 4.1 With the aid of a labelled diagram, illustrate the structure of a chromosome. (6)
- 4.2 Describe how the following three proteins assist in packing genetic material in chromosomes: (9)
- 4.2.1 Nucleosomes
- 4.2.2 Histones
- 4.2.3 Chromatin
- 4.3 How many chromosomes are in a human cell? (1)

SECTION C (41 MARKS)

QUESTION 5

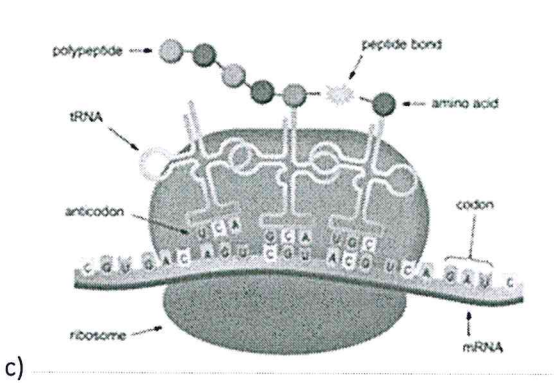
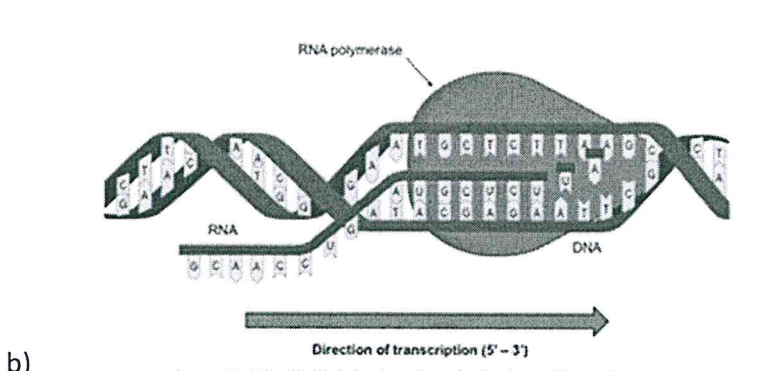
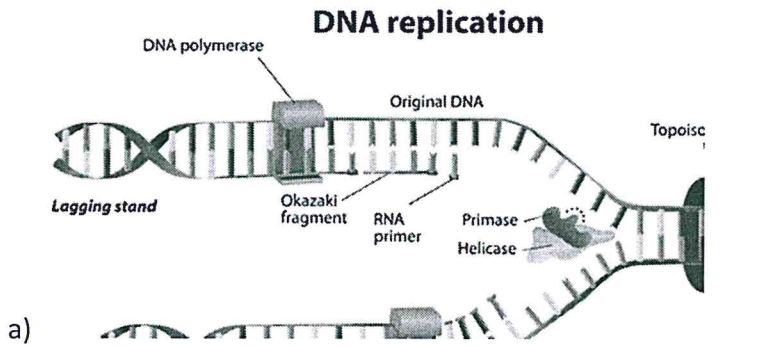
[18]

- 5.1 Unlike the plasma membrane that uses plasma proteins to transport substances in and out of the cells, the nuclear transport is assisted by the nuclear pore complex. Explain how this happens. (8)
- 5.2 Classify the ways in which cells communicate to one another. (10)

QUESTION 6

[23]

6.0 The following diagrams depicts a) replication b) transcription c) translation



6.1 For a) state the functions of the enzymes in the diagram in the correct order of events. (8)

6.2. For b) the RNA polymerase is main enzyme in transcription and also the most studied in vitro. (6)
 What is its function in transcription? Describe the THREE types of RNA polymerases you were taught

6.3 For c, translation occurs in 3 steps. Briefly describe them. **(End of paper)** (9)