



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: JANUARY 2020	PAPER: THEORY
DURATION: 3 HOURS	MARKS: 100

SUPPLEMENTARY/SECOND OPPORTUNITY EXAMINATION PAPER	
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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 (45 MARKS)

QUESTION 1

[15]

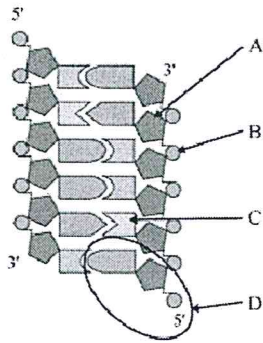
Evaluate the statements in each numbered section and select the most appropriate answer or phrase from the given possibilities. Write the appropriate letter next to the number of the statement/phrase.

- 1.1 The endoplasmic reticulum works closely with which of the following organelle to carry out its function? (1)
- A) Vacuole
 - B) Lysosome
 - C) Nucleolus
 - D) Gogli Apparatus
- 1.2 Which of the following is not true about mitotic spindle but rather speaks of contractile ring: (1)
- A) Physically splits the cell in two
 - B) Made of microtubules
 - C) Duplicates chromosome
 - D) Splits the nucleus in two
- 1.3 Identify the enzyme responsible for relaxing the DNA helix during replication (1)
- A) Helicase
 - B) Primase
 - C) Ligase
 - D) Topoisomerase
- 1.4 Identify the histone protein that pulls the nucleosomes together to complete the chromosomal structure (1)
- A) H1
 - B) H2A
 - C) H2B
 - D) H3
- 1.5 Functional sections of DNA molecule that code for a protein are defined as.... (1)
- A) Codon
 - B) Exons
 - C) Intron
 - D) Promotor

- 1.6 A macrophage is responsible for: (1)
- A) Exocytosis
 - B) Vesicular Transport
 - C) Phagocytosis
 - D) Pinocytosis
- 1.7 Vesicular transport is between the endomembrane system, which of the following organelles form part of this system. (1)
- A) Endoplasmic Reticulum
 - B) Golgi Apparatus
 - C) Plasma membrane
 - D) Lysosome
- 1.8 Identify the protein that is responsible for the identification of target organelles during vesicular transport? (1)
- A) Rab proteins
 - B) SNARE
 - C) COPI coated proteins
 - D) Clathrin coated proteins
- 1.9 Communication often involves converting signals that carry information from one form to another, this is known as..... (1)
- A) Paracrine signalling
 - B) Transduction signalling
 - C) Endocrine signalling
 - D) Neuronal signalling
- 1.10 The following molecules are all transported by active transport except..... (1)
- A) Glucose
 - B) Amino acids
 - C) Potassium
 - D) Carbon Dioxide
- 1.11 Identify the cell adhesion molecule that form desmosomes (1)
- A) Selectin
 - B) Immunoglobulin
 - C) Cadherin
 - D) Integrin

1.12 Label the following DNA structure according to the letters

(4)



1.12.1 A-

1.12.2 B-

1.12.3 C-

1.12.4 D-

QUESTION 2

[10]

Define the following terms:

1.1 Chromosome

(2)

1.2 Gene

(2)

1.3 Genome

(2)

1.4 Genetic code

(2)

1.5 Codon

(2)

QUESTION 3**[21]**

3.1 Match the following statements in column B with the appropriate phases in column A, on phase can represent more than one statement. Write the number representing the statement with the matching phase next to it. (10)

Column A	B
3.1.1 Nucleus divides into two	Prophase
3.1.2 Chromosomes arrive at opposite poles and decondense	Metaphase
3.1.3 Chromosome becomes visible as they begin condensing	Anaphase
3.1.4 Mitotic spindle breaks down	Telophase
3.1.5 Nuclear membrane starts disappearing	
3.1.6 Chromatids split in two	
3.1.7 Chromatid attach to spindle fibres	
3.1.8 Chromatids pulled to opposite sides	
3.1.9 Division of cytoplasm starts	
3.1.10 Spindle fibres start to appear	

3.2 Identify four scientist that played a significant role in the study of cells and state the roles they each played. (8)

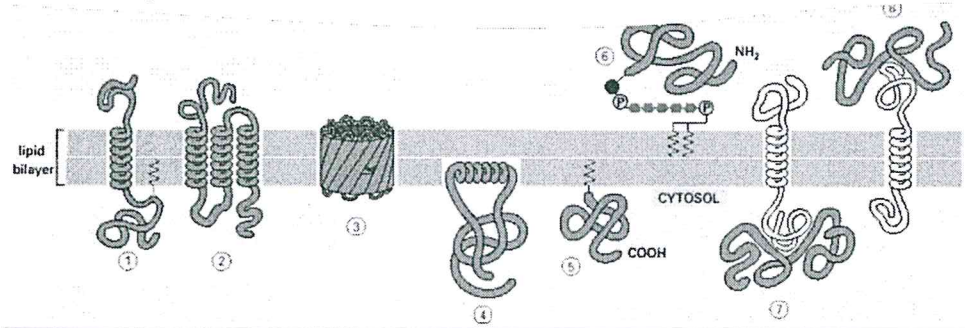
3.3 What does the cell theory state? (3)

SECTION B (24 MARKS)

QUESTION 4

[14]

4.1 With the help of the diagram, state how proteins are organized into the lipid bilayer. (4)



4.2 With examples, state the main functions of membrane proteins. (10)

QUESTION 5

[10]

5.1 State the difference between leading and lagging DNA replication strands. (6)

5.2 For the following DNA strand going through replication:

- 3' AAA TCG GTA GAA GCC CAA ACG TTC CAC GAT GCG ... 5'

a) Predict the sequence of the complementary strand (2)

b) Is the new strand lagging or leading? Explain your answer (2)

SECTION C (31 MARKS)

QUESTION 6

[16]

6.1 Explain how the G-protein coupled receptor fulfils its role in cell signalling.

(8)

6.2 Explain the functions of the following proteins in translation:

(8)

6.2.1 Initiation factor 1 (IF1)

6.2.2 Initiation Factor 2 (IF2)

6.2.3 Initiation Factor 3 (IF3)

6.2.4 Elongation Factor Temperature stable (EFT_S)

6.2.5 Elongation Factor Temperature unstable (EFT_U)

6.2.6 Elongation Factor G (EF_G)

6.2.7 Release Factor

6.2.8 Peptidyl Transferase

QUESTION 7

[15]

7.1 Explain the mechanisms a cell has in place to regulate cell division to ensure minimum errors during the different phases.

THE END!