



**MASINDE MULIRO UNIVERSITY OF
SCIENCE AND TECHNOLOGY
(MMUST)**

MAIN CAMPUS

**UNIVERSITY EXAMINATIONS
2021/2022 ACADEMIC YEAR
(MAIN EXAMINATION PAPER)**

FIRST YEAR, SECOND TRIMESTER EXAMINATION

**FOR THE DEGREE
OF**

**BACHELOR OF SCIENCE IN CLINICAL MEDICINE/HEALTH
PROFESSION EDUCATION AND BSC.PHYSIOTHERAPY**

COURSE CODE: BIO 111/112

COURSE TITLE: MEDICAL BIOCHEMISTRY II

DATE: WEDNESDAY 20TH APRIL 2022 **TIME: 8:00 – 11:00 AM**

INSTRUCTIONS TO CANDIDATES

Section A: Multiple choice questions 20 marks
Section B: Short Answer Questions 40 marks
Section C: Long Answer Questions 40 marks

TIME: 3 Hours

MMUST observes ZERO tolerance to examination cheating

This Paper Consists of 5 Printed Pages. Please Turn Over. 

Section A: Multiple choice questions

1. The function of β subunit of polymerase is
 - a) Template binding
 - b) Catalytic binding
 - c) Promoter binding
 - d) Cation binding
 - e) Anion binding
2. Which enzyme is used to join nicks in the DNA strands?
 - a) Primase
 - b) DNA polymerase
 - c) DNA ligase
 - d) Endonuclease
 - e) Exonuclease
3. During DNA replication the synthesis of the leading strand of DNA results in fragments known as:
 - a) Okazaki fragments
 - b) Satellite segments
 - c) Kornberg segment
 - d) Double-helix segment
 - e) Alpha helix segment
4. Which of the following base pairing rule is correct?
 - a) Adenine with guanine and thymine with cytosine
 - b) Thymine with adenine and guanine with uracil
 - c) Adenine with cytosine and guanine with thymine
 - d) Adenine with thymine and guanine with cytosine
 - e) Uracil with thymine and guanine with cytosine
5. Which enzyme is used in the unwinding of DNA?
 - a) Ligase
 - b) Topoisomerase
 - c) Helicase
 - d) Exonuclease
 - e) Endonuclease
6. An example of a purine base in RNA is
 - a) Thyamine
 - b) Adenine
 - c) Uracil
 - d) Cytosine
 - e) Thiamine
7. Formation of a new DNA molecule from the parent DNA which are exactly similar to its replica is called
 - a) Transcription
 - b) Replication
 - c) Translation

- d) Mutation
e) mutarotation
8. The enzymes responsible for joining the okazaki fragments are
- a) DNA polymerase I
 - b) DNA polymerase II
 - c) DNA ligase
 - d) Topoisomerase
 - e) DNA helicase
9. Which of the following is true according to Chargaff's rule
- a) $A+G=T+C$
 - b) $A=C$
 - c) $G=T$
 - d) $A+T/C+G=1$
 - e) $C+G/A+T=1$
10. The complete replication apparatus moving along the DNA molecule at a replication fork is called
- a) Polysome
 - b) Replisome
 - c) Replicon
 - d) Origin
 - e) Primer
11. The smaller subunit of ribosome in eukaryotes is
- a) 30s
 - b) 60s
 - c) 40s
 - d) 80s
 - e) 73s
12. The enzyme which help in the formation of peptide bond is
- a) Translocase
 - b) Peptidyl transferase
 - c) DNA polymerase
 - d) Transaminase
 - e) oxidoreductase
13. Amino acids are the building blocks of:
- a) DNA
 - b) RNA
 - c) Lipids
 - d) Proteins
 - e) Carbohydrates
14. The largest molecules in our bodies are:
- a) Nucleic acids
 - b) Chromosomes
 - c) Proteins
 - d) Amino acids

- e) Carbohydrates
15. The human body is composed mainly of
- Calcium, iron, phosphorus and zinc
 - Oxygen, hydrogen, calcium and iron
 - Oxygen, nitrogen, hydrogen, and carbon
 - Magnesium, carbon, iron, hydrogen
 - Nitrogen, iron, oxygen, carbon and hydrogen
16. Which of the following statement is true about the protein synthesis process?
- When a section of a DNA molecule unwinds and unzips along its bases, a transfer RNA forms by copying one side of the DNA
 - The transfer RNA leaves the nucleus and goes out to the ribosome in the cytoplasm where proteins are assembled with the help of mRNA
 - Statement number (a) is true while statement number (b) is false
 - All the statements are true
 - None of the above
17. Each tRNA anticodon has three bases. The three base combinations are codes for attracting specific kinds of:
- Endoplasmic reticula
 - Ribosomes
 - Amino acids
 - Proteins
 - Enzymes
18. What covalent bonds that link nucleic acid monomers?
- Hydrogen bonds
 - Carbon – nitrogen bond
 - Oxygen – nitrogen bond
 - Phosphodiester bonds
 - Carbon – carbon double bonds
19. A gene is essentially a:
- Sequence of many codons in a DNA molecule
 - Single codon in a DNA molecule
 - Chromosome
 - Replisome
 - Origin of DNA replication
20. Portions of DNA molecules that do not contain the codes for proteins are called:
- Introns
 - Exon
 - Mutagens
 - Extron
 - Oncogene

Section B: Short Answer Questions

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40 Marks

1. Demonstrate and explain Chargaff's principle using a clear diagram (8marks)
2. Explain the different between and DNA and RNA molecules (8 marks)
3. What is the function of single strand binding protein (SSBP) and DNA helicase? (8 marks)
4. Demonstrate and explain the Watson and Crick model of DNA with a clear diagram (8 marks)
5. What are the Pribnow and TATA boxes and explain their role in the process of DNA replication? (8 marks)

Sections C: Long Answer Questions

40 marks

1. Describe the process of protein biosynthesis (20 marks)
2. Define biotransformation and explain five (5) mechanisms of biotransformation (20 marks)