



UNIVERSITY OF JAFFNA, SRI LANKA
FACULTY OF ALLIED HEALTH SCIENCES
THIRD YEAR FIRST SEMESTER EXAMINATION IN
B.Sc. (HONS) IN MEDICAL LABORATORY SCIENCES – 2019

MLSBM 3131 BIOTECHNOLOGY AND MOLECULAR BIOLOGY 1

Date: 29.04.2021

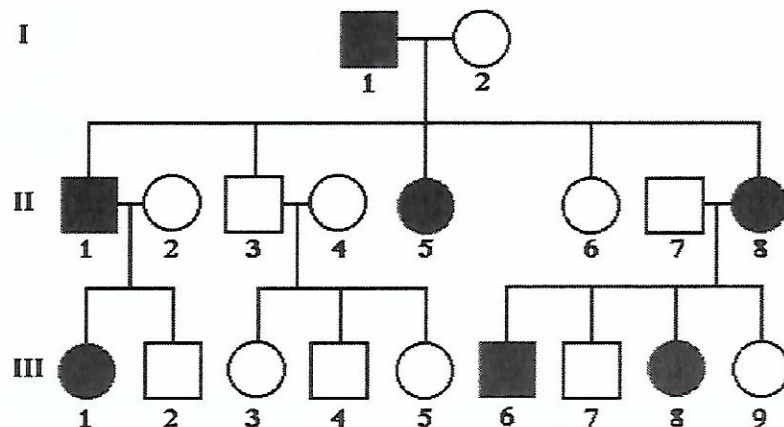
Time: 1 Hour

ANSWER ALL FOUR QUESTIONS

1.

- 1.1. Describe how mutations in DNA are caused. (35 marks)
- 1.2. Explain the importance of DNA mismatch repair mechanism. (25 marks)
- 1.3. Assess the advantage of Homologous Recombination (HR) Repair over Non-homologous end joining (NHEJ). (20 marks)
- 1.4. Name the different kinds of blotting techniques available for DNA, RNA and Protein. (20 marks)

2. Refer the pedigree of a family with hypercholesterolemia to answer the questions below.



- 2.1. Identify the most probable pattern of inheritance for this condition. (10 marks)
- 2.2. Explain your reasons for your identification in 2.1. (40 marks)
- 2.3. Name ^{three} ~~two~~ (03) molecular techniques to determine whether the mutant allele is present in a given individual. (15 marks)
- 2.4. Briefly state how mitochondrial inheritance differs from other inheritance patterns. (35 marks)

- 3.
- 3.1. Write a note on Short Tandem Repeats (STR) in DNA fingerprinting. (40 marks)
 - 3.2. Name one (01) method you could use to determine whether the gene was successfully incorporated in recombinant DNA. (10 marks)
 - 3.3. Briefly explain the method you mentioned in 3.2. (20 marks)
 - 3.4. Briefly describe the uses of gene transfers in biomedical applications with examples. (30 marks)
4. Briefly explain the following in relation to Protein synthesis.
- 4.1. Rho (ρ) protein (30 marks)
 - 4.2. Shine-Dalgarno sequence (20 marks)
 - 4.3. Activation of amino acids (20 marks)
 - 4.4. RNA Polymerase (30 marks)

