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22 MAR 2023

THE OPEN UNIVERSITY OF SRI LANKA
FACULTY OF HEALTH SCIENCES
DEPARTMENT OF MEDICAL LABORATORY SCIENCES
ACADEMIC YEAR 2022/2023 – SEMESTER I



BACHELOR OF MEDICAL LABORATORY SCIENCES HONOURS
MDU6301 – CYTOGENETICS & MOLECULAR GENETICS

FINAL EXAMINATION

DURATION: 03 HOURS

DATE: 22nd MARCH 2023

TIME: 01.30 PM – 04.30 PM

2.

3.

4.

5.

Part B: Structured Essay Questions (40 marks)

Q1.

1.1 State four (04) classes of chromosomes that are based on the position of their centromeres. (02 Marks)

- i.
- ii.
- iii.
- iv.

1.2 List two (02) functions of the chromosome. (02 Marks)

- i.
- ii.

1.3 List the four (04) structural chromosomal aberrations. (04 marks)

- i.
- ii.
- iii.
- iv.

1.4 Briefly describe the cause for Cri-du-chat syndrome. (02 marks)

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(Total 10 marks)

Q2.

2.1 Briefly describe the term "inheritance".

(01 Marks)

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2.2 Outline Mendel's laws of genetic inheritance.

(03 Marks)

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2.3 Illustrate the inheritance of sickle cell anemia from carrier parents to their offspring.

(04 Marks)

2.4 Identical twins share the same genome while non-twin siblings have their own unique genomes. Briefly explain. (02 Marks)

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(Total 10 marks)

Q3.

3.1 What do you mean by genetic counselling? (02 Marks)

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3.2 Outline two (02) uses of genetic counselling. (02 Marks)

- i.
- ii.

3.3 Briefly describe the following terms.

i. Pharmacogenetics (01 Mark)

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ii. Pharmacogenomics (03 Marks)

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3.4 Briefly describe one (01) application of Pharmacogenetics.

(02 Marks)

(Total 10 marks)

Q4.

4.1 Define the term "Recombination".

(01 Mark)

4.2 List two (02) natural gene transfer techniques in microorganisms.

(02 Marks)

- i.
- ii.

4.3 List two (02) limitations of Fluorescence In Situ hybridization (FISH) Technique.

(02 Marks)

- i.
- ii.

4.4

a) List three (03) requirements of Polymerase Chain Reaction (PCR).

(03 Marks)

- i.
- ii.
- iii.

b) Briefly explain two (02) applications of PCR.

(02 Marks)

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(Total 10 marks)

Part C: Essay Questions (30 marks)

Q1. Explain why drug responses differ among individuals.

(15 Marks)

Q2. Explain the difficulties that can arise when dealing with genetics in children. (15 Marks)

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