

THE OPEN UNIVERSITY OF SRI LANKA
FACULTY OF HEALTH SCIENCES
DEPARTMENT OF MEDICAL LABORATORY SCIENCES
ACADEMIC YEAR 2023/2024 – SEMESTER I



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

FINAL EXAMINATION

DURATION: 03 HOURS

DATE: 28TH MARCH 2024

TIME: 09.30 AM – 12.30 PM

INDEX NO:

Part B: Structured Essay Questions (40 marks)

Q1.

1.1 If a sperm cell of an animal contains eight chromosomes, how many chromosomes would be found in the spermatogonia cell, which is preparing to undergo meiosis? (02 Marks)

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1.2 How many chromosomes would be present in a primary spermatocyte cell at metaphase I of meiosis? (02 Marks)

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1.3 How many chromosomes would be present in a secondary spermatocyte cell at metaphase II of meiosis? (02 Marks)

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1.4 'The genetic composition of a human zygote will differ from that of both parents.' Briefly explain. (04 Marks)

[illegible]

(Total 10 Marks)

Q2.

2.1 What is a karyogram?

(01 Mark)

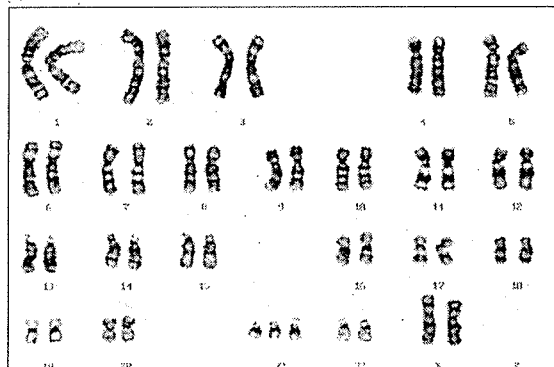
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2.2 Identify the birth defect by examining each of the following karyograms and mention the major symptoms associated.

a)



Birth defect:

(01 Mark)

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Symptoms:

(02 Marks)

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b)



Birth defect:

(01 Mark)

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Symptoms:

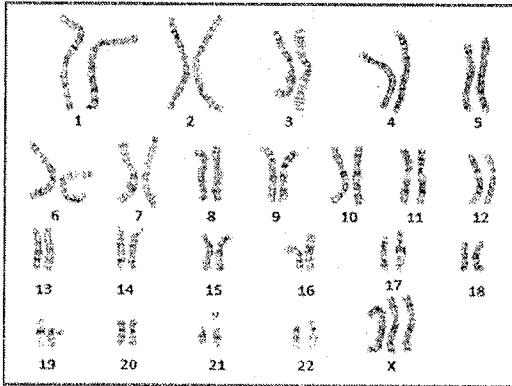
(02 Marks)

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c)



Birth defect:

(01 Mark)

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Symptoms:

(02 Marks)

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(Total 10 Marks)

Q3.

3.1 Assuming the normal chromosomal structure as "1 2 3 4 5 6 7 8" Mention the type of Chromosomal Aberration in the space provided. (06 Marks)

- a) 1 2 5 6 7 8
- b) 1 2 3 4 4 5 6 7 8
- c) 1 2 3 4 5 8 7 6

3.2 Briefly explain the inheritance pattern of Cystic fibrosis.

(04 Marks)

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(Total 10 Marks)

Q4. Write short notes on the following.

a) Packaging of DNA into chromosomes

(05 Marks)

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b) DNA extraction

(05 Marks)

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(Total 10 Marks)

Part C: Essay Questions (30 Marks)

Q1. Discuss the differences between nuclear genome and mitochondrial genome. **(15 Marks)**

Q2. Discuss the importance of genetic counseling in contemporary healthcare, considering its role in addressing various genetic and hereditary conditions. **(15 Marks)**

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