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BM2101 - Analysis of Physiological Systems – Assignment 04

**Compartment Modelling**

**Part 01 - Question 01**

1. Step input to a normal person

Chart, line chart

Description automatically generated

1. Bolus input to a normal person

Chart, line chart

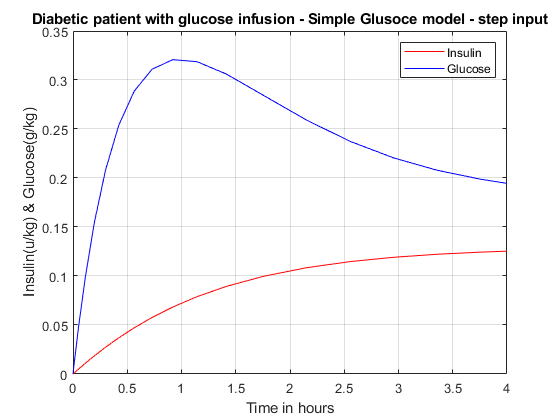
Description automatically generated

1. Step input to a diabetic patient

Chart, line chart

Description automatically generated

1. Step input to a diabetic patient with glucose infusion



**Question 02**

1. Iodine intake for normal condition – 10 days

Chart

Description automatically generated

1. Iodine intake for normal condition – 300 days

Chart

Description automatically generated

1. Drop in intake – 10 days

Chart

Description automatically generated

1. Drop in intake – 300 days

Chart, line chart

Description automatically generated

1. Hyperthyroidism due to autoimmune thyroid disease.

Hypothyroidism is a disease where the thyroid gland can’t produce and release enough thyroid hormone to the blood. When it happens due to autoimmune thyroid disease, the magnitudes of the coefficients related to gland iodine should be reduced.

Chart, line chart

Description automatically generated

A picture containing graphical user interface

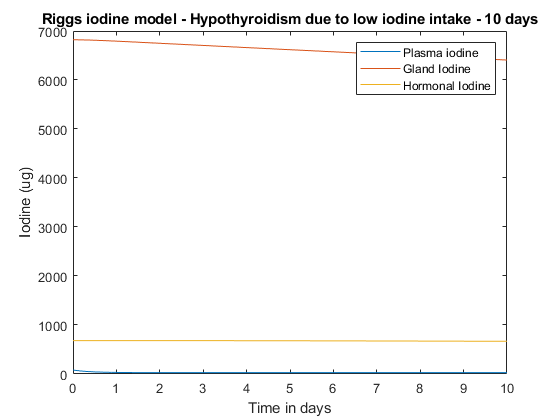
Description automatically generated

1. Hypothyroidism due to low iodine intake.

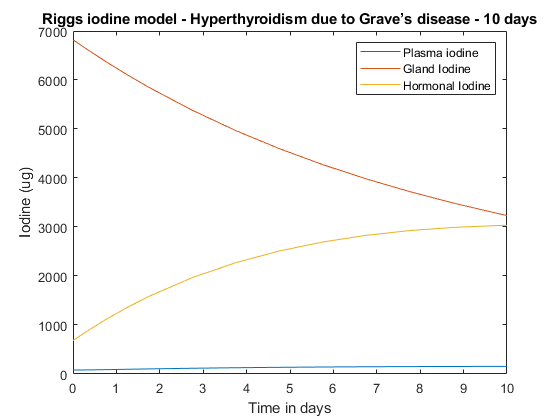
Hypothyroidism can happen also due to low Iodine intake. Then we can change the vector related to intake of iodine.

Chart, line chart

Description automatically generated



1. Hyperthyroidism due to Grave’s disease

Chart

Description automatically generatedHyperthyroidism is a disease that caused by the over production of thyroxine hormone by thyroid gland. Grave’s disease leads to the above mentioned over production of hormones. It is an immune system disorder. Hence the coefficients related to gland iodine should increase.

1. When a person has a goiter, his/her thyroid gland grows larger. Lack of iodine in the diet is the main reason for goiter. Few of common causes for goiters are Hashimoto’s disease, Grave’s disease, Thyroid nodules. We can reduce the iodine input in the riggs model. Also, goiters can lead to either hyperthyroidism or hypothyroidism. Therefore, we cannot exactly say what should we do for the coefficients related to gland iodine.

Not all thyroid tumors are cancerous. Only a small number of types of thyroid tumors are cancerous. The reason behind these cancers can be Iodine deficiency. It can cause either hyperthyroidism or hypothyroidism. Hence, we can use the riggs model with low iodine input.

**Part 02 - Question 01**

Diagram

Description automatically generatedModel 01

Insulin graph

Chart, line chart

Description automatically generated

Glucose graph

Chart, line chart

Description automatically generated

Diagram

Description automatically generatedModel 02

Insulin graph

Chart, line chart

Description automatically generated

Glucose graph

Chart, line chart

Description automatically generated

Diagram, schematic

Description automatically generatedModel 03

Insulin graph

Chart, line chart

Description automatically generated

Glucose graph

Chart, line chart

Description automatically generated

Diagram

Description automatically generatedModel 04

Insulin graph

Line chart

Description automatically generated

Glucose graph

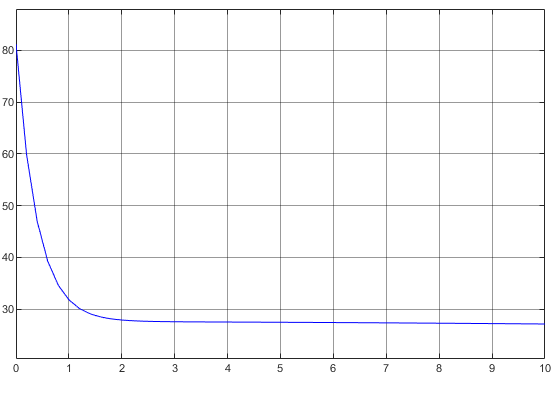
Chart, line chart

Description automatically generated

Diagram

Description automatically generated **Part 02 - Question 02**

Plasma Iodine graph



Gland Iodine graph

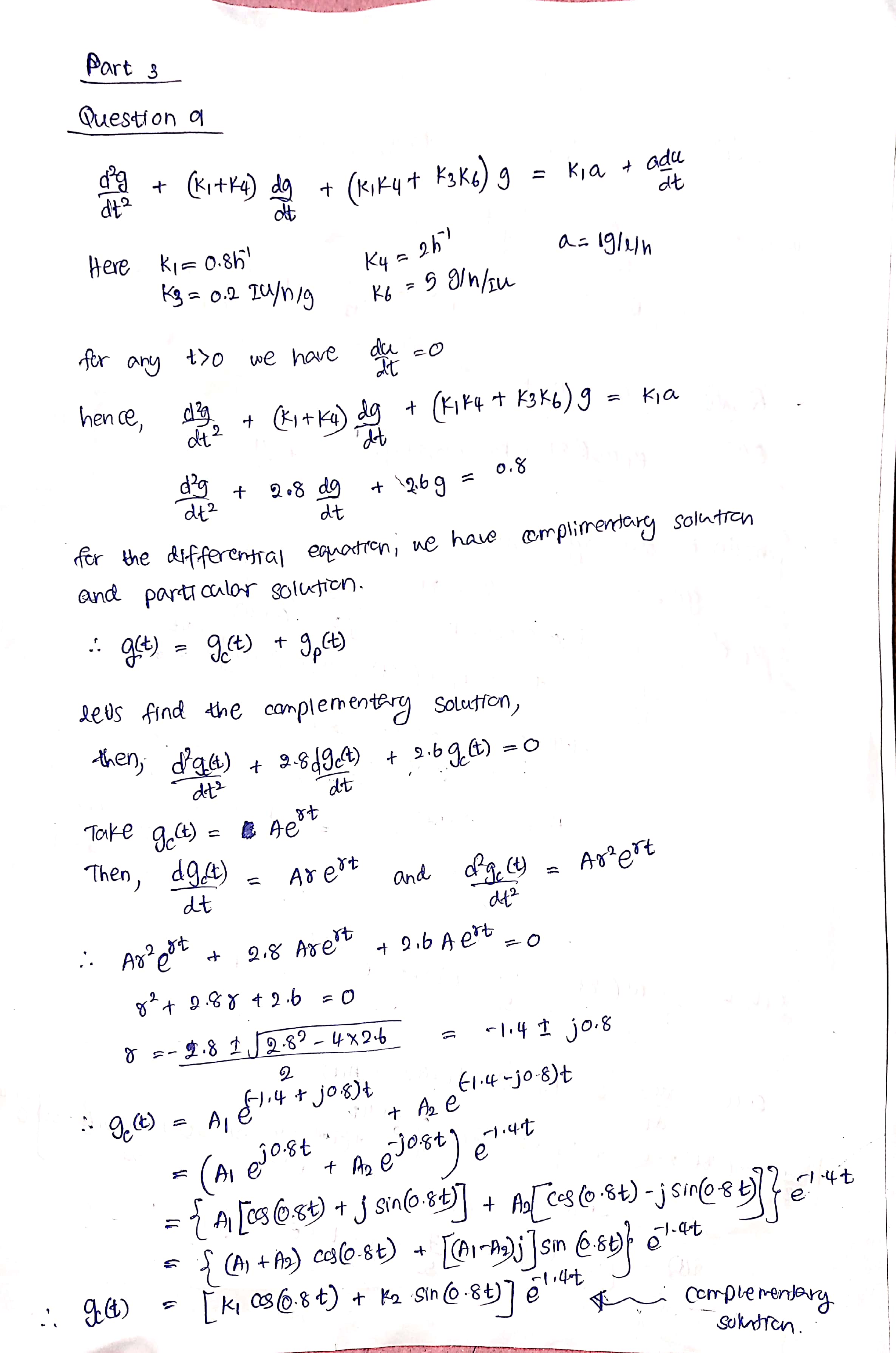
Chart, line chart

Description automatically generated

Hormonal Iodine graph

Chart, line chart

Description automatically generated



Text, letter

Description automatically generated

Diagram, schematic

Description automatically generated

Text, letter

Description automatically generated

Diagram, schematic

Description automatically generated

Chart

Description automatically generated