**GRIFFITH COLLEGE DUBLIN**

**GRIFFITH COLLEGE CORK**

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**QUALITY AND QUALIFICATIONS IRELAND**

**EXAMINATION**

**HIGHER CERTIFICATE IN COMPUTING SCIENCE**

**STAGE II**

**LINEAR ALGEBRA**

**Module Code: HCC-LA**

**BACHELOR OF SCIENCE IN COMPUTING**

**STAGE II**

**LINEAR ALGEBRA**

**Module Code: BSCO-LA**

**BACHELOR OF SCIENCE (HONS) IN COMPUTING SCIENCE**

**STAGE II**

**LINEAR ALGEBRA**

**Module Code: BSCH-LA**

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**External Examiner(s): Dr Joseph Timoney**

**Date: 24th May 2018 Time: 2.15-4.15**

**THIS PAPER CONSISTS OF FIVE QUESTIONS**

**FOUR QUESTIONS TO BE ATTEMPTED**

**ALL QUESTIONS CARRY EQUAL MARKS**

**THE USE OF NON PROGRAMMABLE CALCULATORS IS PERMITTED**

**GRAPH PAPER TO BE SUPPLIED**

***Note****:* Solutions will get credit for “correct method of working” and, where appropriate, for “checking the answer”.

**QUESTION 1**

1. Let and , find values if X =0

**(6 marks)**

1. Find the angle between vector

**(4 marks)**

1. Proof that the following is true for matrix A,

A =

**(15 marks)**

**Total (25 marks)**

**QUESTION 2**

Given the following system of equations:

x - 2y - 6z = 12

2x + 4y + 12z = -17

x - 4y - 12z = 22

1. Express the system in matrix form.

**(3 marks)**

1. Express the system in augmented matrix form.

**(2 marks)**

1. Using matrices **solve** for x, y and z using **Gauss-Jordan elimination** (reduced row echelon format).

**(20 marks)**

**Total (25 marks)**

**QUESTION 3**

1. A gym has 150 members. 112 of the members use the gym. 68 members go to the classes. 14 of the members don’t use the gym or go to classes. Use this information to complete the Venn Diagram.

G represents those members who use the Gym. C represents those members who go to Classes.

**(6 marks)**



1. The Venn diagram gives information about the number of elements in the set 𝑅 and set 𝑆. Given that P(𝑅)=𝑃(𝑆), find the value of 𝑥.

**(10 marks)**



1. Solve for x value in the expression

**(9 marks)**

**Total (25 marks)**

**QUESTION 4**

1. You are required to plot the graph of a function of x.

Construct a table of values for x and y where **y = 2x3 - 5x2 – x + 4**

for **-3 ≤ x ≤ 3**, with **intervals of 0.5**

You **must** show the intermediate values for each part of the function. ***Note****: you are advised to use 1 decimal place of accuracy for calculations.*

**(15 marks)**

1. Plot the graph of **y = 2x3 - 5x2 – x + 4** for **-3 ≤ x ≤ 3**, with **intervals of 0.5**.

**(10 marks)**

**Total (25 marks)**

**QUESTION 5**

1. Evaluate the modulo arithmetic expressions, 15 \* 17 - 23 \* 12**2  (mod 9)**

**(3** **marks)**

1. Create a **modulo 5** multiplication table.

**(5 marks)**

1. Solve:

**(7 marks)**

1. Find the value for ‘a’, where ‘a’ is constant that ensure the following equation is true for all values of

=

**(10 marks)**

**Total (25 marks)**