Mathematics for Software Development

BSc (Hons) Computer Games Programming

School of Engineering, Arts, Science and Technology

Answer all of the following questions, showing all of your working. Use extra pages if necessary.

**To be completed by 09:00 Monday 1st February 2021**

Student ID …………………………………..

This problem set has 8 questions, for a total of 100 points.

Marks Awarded:

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Question** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **Total** |
| **Marks Available** | **10** | **10** | **10** | **10** | **15** | **15** | **15** | **15** | **100** |
| **Score** |  |  |  |  |  |  |  |  |  |

Question 1

Answer each of the following. Where the answer is a set list the elements between braces. [1 point each part]

𝒰 = {1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12}

and

Points awarded: \_\_\_\_\_\_\_\_\_ out of a possible 10.

Question 2

Write each of the following sets by listing their elements between braces.

[2 points each part]

Points awarded: \_\_\_\_\_\_\_\_\_ out of a possible 10.

Question 3

Answer each of the following by indicating whether the following statements are True or False. [1 point each part]

1. True/False
2. True/False
3. True/False
4. True/False
5. True/False
6. True/False
7. True/False
8. True/False
9. True/False
10. True/False

Points awarded: \_\_\_\_\_\_\_\_\_ out of a possible 10.

Question 4

Answer each of the following. [1 point each part]

If , and the universal set 𝒰

Find:



Points awarded: \_\_\_\_\_\_\_\_\_ out of a possible 10.

Question 5

In a survey, 200 students are asked if they like basketball (B), football (F) and swimming (S). The Venn diagram below shows the results.

|  |
| --- |
| 𝒰  *z*  *y*  *x*  20  16  18  12  8  F  B  S  42 students like swimming.40 students like exactly one sport.   1. Find the values of x, y and z. [9 marks]   (b) How many students like,  (i) more than one sport, [3 marks]  (ii) basketball or swimming but not football? [3 marks]  *y*  21  18  17  F  B |

Points awarded: \_\_\_\_\_\_\_\_\_ out of a possible 15.

Question 6

A veterinarian surveys 30 of his patrons. They discovers that 15 have dogs, 10 have cats, and five have fish. Four have dogs and cats, three have dogs and fish, and two have a cat and a fish. If only one has all three kinds of pets, how many patrons have none of these pets? Complete the Venn diagram below to show your workings.

|  |
| --- |
|  |

Points awarded: \_\_\_\_\_\_\_\_\_ out of a possible 15.

Question 7

Answer each of the following. [5 points each part]

If , and find:



Points awarded: \_\_\_\_\_\_\_\_\_ out of a possible 15.

Question 8

Answer each of the following.

𝒰 = {1, 2, 3, …, 10} , and

1. Place the 10 numbers in the correct places in the Venn diagram below. [10 points]

𝒰

1. State the value of the following, [1 points each]

Points awarded: \_\_\_\_\_\_\_\_\_ out of a possible 15.