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| Engineering and Technology | | | |
| Ramaiah University of Applied Sciences | | | |
| Department | Computer Science and Engineering | Programme | B. Tech. |
| Semester/Batch | 3rd/2019 | | |
| Course Code | CSC201A | Course Title | Discrete Mathematics-1 |
| Course Leader(s) | Ms Sahana P. Shankar and Ms.Supriya | | |

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| Questions | Marking Scheme | | Marks | | |
| Max Marks | First Examiner Marks | Moderator |
| 1 |  | | | | |
| 1.1 | Development of a Python program with comments to create sets and perform the specified operations | 5 |  |  |
| 1.2 | Illustration using Venn diagrams | 2 |  |  |
| **Question 1 Max Marks** | | **7** |  |  |
| 2 |  | | | | |
| 2.1 | Justification of the statement with appropriate reasoning | 2 |  |  |
| 2.2 | Solution to the example problem | 1 |  |  |
| **Question 2 Max Marks** | | **3** |  |  |
| **Total Assignment Marks** | | | 10 |  |  |

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| **Course Marks Tabulation** | | | | |
| **Question** | **First Examiner** | **Remarks** | **Moderator** | **Remarks** |
| 1 |  |  |  |  |
| 2 |  |  |  |  |
| **Marks (Max 10 )** |  |  |  |  |
| **Signature of First Examiner Signature of Moderator** | | | | |

**Please note:**

1. Documental evidence for all the components/parts of the assessment such as the reports, photographs, laboratory exam / tool tests are required to be attached to the assignment report in a proper order.
2. The First Examiner is required to mark the comments in RED ink and the Second Examiner’s comments should be in GREEN ink.
3. The marks for all the questions of the assignment have to be written only in the **Component – CET B: Assignment** table.
4. If the variation between the marks awarded by the first examiner and the second examiner lies within +/- 3 marks, then the marks allotted by the first examiner is considered to be final. If the variation is more than +/- 3 marks then both the examiners should resolve the issue in consultation with the Chairman BoE.

**Assignment**

**Instructions to students:**

1. The assignment consists of **2** questions.
2. Maximum marks is **10**.
3. The assignment has to be neatly word processed as per the prescribed format.
4. The maximum number of pages should be restricted to **5**.
5. The printed assignment must be submitted to the course leader.
6. **Submission Date: 04/11/2019**
7. **Submission after the due date is not permitted.**
8. **IMPORTANT**: It is essential that all the sources used in preparation of the assignment must be suitably referenced in the text.
9. Marks will be awarded only to the sections and subsections clearly indicated as per the problem statement/exercise/question

**Preamble**

In this Course, the principles, concepts and applications of logic and discrete mathematical structures. Set theory, relations, functions, ordering, induction and modular integer arithmetic are covered. Theory and application of Propositional, Predicate and Hoare Logics for verification of computing systems are discussed. Abstract algebraic structures of Boolean algebras, lattices, groups, rings and fields are taught along with their computer science and engineering applications. This Assignment is designed to evaluate the student’s learning outcomes pertinent to the Course.

**Question 1** **(7 Marks)**

Sets are one of the basic building blocks for the types of objects considered in discrete mathematics. All programming languages have set operations. Many different systems of axioms have been used to develop set theory. Boolean algebra is used extensively in the design of digital electronic circuitry, for example in, calculators and personal computers. Set theory provides the basis of topology, the study of sets together with the properties of various collections of subsets. In this context, the student is required to develop a program to create and populate two sets A and B and perform various set operations on them such as union, intersection, complement and difference. The student is also required to illustrate the results using Venn diagrams with the help of software.

The effort needs to be documented along the following lines:

* 1. Development of a Python program with comments to create sets and perform the specified operations
  2. Illustration using Venn diagrams

Note: Contact the Course Leader for the set related data.

**Question 2** **(3 Marks)**

“Mathematical Induction can be applied to prove that the cardinality of a power set is 2n, where n is the cardinality of the set”. State whether the statement is true or false with justification. If True, prove with an example.

The effort needs to be documented along the following lines:

* 1. Justification of the statement with appropriate reasoning
  2. Solution to the example problem