| Faculty of Engineering and Technology | | | |
|---|---|---|---|
| **Ramaiah University of Applied Sciences** | | | |
| Department | Computer Science and Engineering | Programme | B. Tech. in CSE |
| Semester/Batch | 7/2017 | | |
| Course Code | CSC401A | Course Title | Computational Intelligence |
| Course Leader | Dr. Vaishali R. Kulkarni/Prof. Prabhakar/Mr. Sagar U. | | |

| **Assignment-02** | | | |
|---|---|---|---|
| **Reg.No.** | | **Name of Student** | |

| **Sections** | | **Marking Scheme** | **Marks** | | |
|---|---|---|---|---|---|
| | | | **Max Marks** | **First Examiner Marks** | **Moderator** |
| **Part A** | | | | | |
| | **A.1.1** | **A critical review of capabilities of Artificial Neural Networks (ANNs)** | **04** | | |
| | **A.1.2** | **The application areas of ANNs** | **04** | | |
| | **A.1.3** | **Conclusion** | **02** | | |
| | | **Part-A Max Marks** | **10** | | |
| **Part B.1** | | | | | |
| | **B.1.1** | **A model of generalised fuzzy decision system** | **05** | | |
| | **B.1.2** | **Fuzzy sets with attributes** | **05** | | |
| | **B.1.3** | **Python program demonstration** | **05** | | |
| | | **B.1 Max Marks** | **15** | | |
| | | **Total Assignment Marks** | **25** | | |

| **Course Marks Tabulation** | | | | |
|---|---|---|---|---|
| **Component-1 (B) Assignment** | **First Examiner** | **Remarks** | **Moderator** | **Remarks** |
| A | | | | |
| B.1 | | | | |
| B.2 | | | | |
| **Marks (out of 25)** | | | | |

**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 1

**Instructions to students:**

1. The assignment consists of **3** questions: Part A-**1** Question, Part B-**4** Questions.
2. Maximum marks are **25**.
3. The assignment must be neatly word processed as per the prescribed format.
4. The maximum number of pages should be restricted to 1**0**.
5. Restrict your report for Part-A to 3 pages only.
6. Restrict your report for Part-B to a maximum of 7 pages.
7. The printed assignment must be submitted to the course leader.
8. **Submission Date: 16th Jan 2021**
9. **Submission after the due date is not permitted.**
10. **IMPORTANT**: It is essential that all the sources used in preparation of the assignment must be suitably referenced in the text.
11. Marks will be awarded only to the sections and subsections clearly indicated as per the problem statement/exercise/question

**Preamble**

The Computational Intelligence course aims to teach the concepts of computational intelligence, intelligent agents, and their applications. The principles of knowledge representation, search strategies, learning, reasoning, and planning are covered in detail. Application of principles of computational intelligence for machine learning, robotics and perception are discussed. Students are required to analyse a given scenario and apply the principles of computational intelligence to design & synthesize intelligent agents.

**Part A** **(10 marks)**

Artificial Neural Networks (ANNs) are very efficient in solving a wide variety of problems. Image recognition, speech processing, time series prediction and robust generalization are the legendary applications of ANNs. On the one hand, researchers are continually developing more and more advanced ANNs to address varieties of challenges. However, some critics argue that ANNs cannot deliver human-like autonomous learning since they make over-simplified assumptions about the structure of the biological nervous system. In this context, the student must write a literature survey on the topic given below:

**"ANNs have been successful in delivering human-like performance in all domains of applications."**

Your report should include:

**A.1.1** A critical review of cognitive capabilities of ANNs

**A.1.2** The application areas in which ANNs have been successful in delivering human-like performance

**A.1.4** Conclusion

**Part B** **(15 Marks)**

Fuzzy approach is based on premise that the key elements in human thinking are not just numbers. Decision maker's response to the different alternatives and preferences to the various attributes may be sometimes expressed in linguistic variables.

Consider the student PROJECT EVALUATION PROBLEM. For project evaluation generally a panel of experts is created. Students show their project with project report and power point presentation. Experts judge the project on different aspects such as project goal and area, functionality, project report documentation etc. and give their opinion linguistically as excellent, very good, good or average or bad. Their opinion is then combined for grading the project. It is difficult to quantify these linguistic opinions, then combining them and deciding the grade. Fuzzy Logic (FL) may serve this purpose very effectively and efficiently. Apply FL for this problem. Your report should include:

**B.1.1**. A model of generalised fuzzy decision system for project evaluation

**B.1.2** Fuzzy sets with attributes

**B.1.3** Python program demonstration for at least 50 test cases.