RAMAIAH UNIVERSITY
OF APPLIED SCIENCES

Faculty of Engineering and Technology			
Ramaiah University of Applied Sciences			
Department	Computer Science and Engineering	Programme	B. Tech. in CSE
Semester/Batch	06/2018		
Course Code	19CSC311A	Course Title	Graph Theory and Optimization
Course Leader	Ms. Pallavi R. Kumar and Mr. Narasimha Murthy K. R.		

Assignment-2			
Reg.No.		**Name of Student**	

Sections		Marking Scheme	Max Marks	First Examiner Marks	Moderator
				Marks	
Part A	A.1.1	Introduction	02		
	A.1.2	GSP Literature Survey	03		
	A.1.3	Challenges of GSP	04		
	A.1.4	Conclusion	01		
		Part-A Max Marks	10		
Part B	B.1.1	Algorithm or Flowchart	04		
	B.1.2	Code Explanation	05		
	B.1.3	Screenshots	06		
		B.1 Max Marks	15		
		Total Assignment Marks	25		

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

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 1

Term - 1

Instructions to students:

1. The assignment consists of **2** questions: Part A-**1** Question, Part B-**1** Question.

2. Maximum marks is **25**.

3. The assignment has to be neatly word processed as per the prescribed format.

4. The maximum number of pages should be restricted to **10**.

5. The printed assignment must be submitted to the course leader.

6. **Submission Date: 20th June 2021**

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

This course intends to teach the concepts, techniques and applications of graph theory and discrete optimization. Basic graph theory and applications of optimization theory for efficient solution of graph problems arising in Computer Science and Engineering as well as Discrete Optimization techniques for Integer Linear Programming and Combinatorial Optimization and their applications are dealt in detail. Students are trained to apply discrete optimization and graph theory to design and analyze solutions for problems in Computer Science and Engineering.

Part A **(10 Marks)**

Historically, Digital Signal Processing (DSP) deals mostly with signals that exist in a continuous domain, and are then sampled to obtain a corresponding digital representation, which is then processed. The sampling grids are in general uniform. Thus, it is only natural that the bulk of signal processing research targets uniform grids. More recently, however, with the ever increasing reach of signal processing techniques, significant attention is being placed on signals that are either intrinsically digital (e.g., social signals, pin codes), or are sampled by a process that does not follow a regular sampling pattern.

As such many of the traditional DSP tools are not applicable in the presence of digital signals and hence the need for a new class of tools arises. Graph Signal Processing (GSP), or processing signals that live on a graph (instead of on a regular sampling grid), has received a lot of attention as a promising research direction.

Develop an essay on the topic **"Graph Signal Processing - Overview and Challenges"**.

Your essay should emphasize on:
  A.1.1 Introduction
  A.1.2 Literature survey on concept on GSP
  A.1.3 Challenges of GSP
  A.1.3 Conclusion

Part B **(15 Marks)**

Develop a computer program that can be used to find the shortest path given an adjacency matrix of a network. The program should allow the user to choose between single source shortest path and all pairs shortest path. Note that the given adjacency matrix may contain positive and negative weights.

Your document should contain:
  B.1.1. Flowchart or Algorithm
  B.1.2 Explanation of important sections of code
  B.1.3 Screenshots to demonstrate working of code and limiting conditions of the algorithms chosen