RAMAIAH UNIVERSITY OF APPLIED SCIENCES

Faculty of Engineering & Technology			
Ramaiah University of Applied Sciences			
Department	Computer Science and Engineering	**Programme**	B. Tech.
Semester/Batch	4th/2017		
Course Code	CSC212A	**Course Title**	Data Communication
Course Leader	Dr. Rinki Sharma, Prof. A. Prabhakara		

Assignment no 1

Name of Student		Register No	

Sections		Marking Scheme	Max Marks	First Examiner Marks	Second Examiner Marks
Part-A	A1.1	Benefits and limitations of Source-Channel separation theorem	02		
	A1.2	Significance and applications of Joint Source and Channel Coding (JSCC)	02		
	A1.3	Conclusion	01		
		Part-A Max Marks	**05**		
Part B 1	B1.1	Introduction	01		
	B1.2	Algorithm / Flowchart for RLE computation	05		
	B1.3	Computation of compressed value of considered data using RLE compression	03		
	B1.4	Conclusion	01		
		B.1 Max Marks	10		
Part B 2	B2.1	Introduction	01		
	B2.2	Implementation of RLE with explanation	04		
	B2.3	Testing of RLE implementation and explanation of obtained output	04		
	B2.4	Conclusion	01		
		B.2 Max Marks	**10**		
		Total Assignment Marks	**25**		

RAMAIAH UNIVERSITY OF APPLIED SCIENCES

Subject Marks Tabulation				
Component- CET B Assignment	**First Examiner**	**Remarks**	**Second Examiner**	**Remarks**
A				
B.1				
B.2				
B.3				
B.4				
Marks (Max 50)				
Marks (out of 25)				
Signature of First Examiner			Signature of Second Examiner	

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.

RAMAIAH UNIVERSITY OF APPLIED SCIENCES

Assignment – 1

Term - 1

Instructions to students:

1. The assignment consists of 3 questions: Part A – 1 Question, Part B- 2 Questions.
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. Restrict your report for Part-A to 2 pages only.
6. Restrict your report for Part-B to a maximum of 8 pages.
7. The printed assignment must be submitted to the subject leader.
8. **Submission Date: 18 February 2019**
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:

Data communication refers to exchange of information between source and destination entities. In this course, students learn the principles, concepts, techniques and technologies of data communication. This assignment is designed to assess student's understanding of principles of data sources, channels and receiver techniques.

PART A **5 Marks**

Preamble

Shannon's separation theorem states that source coding and channel coding can be performed separately and sequentially. This theorem has been used for years for information encoding. However, researchers have observed that Joint Source and Channel Coding tends to perform better for real-time data transmission over noisy channels. In this context, develop an essay on **"Joint Source and Channel Coding (JSCC)"**

Your essay should comprise the following:

- **A1.1** Benefits and limitations of Source-Channel separation theorem
- **A1.2** Significance and applications of JSCC
- **A1.3** Conclusion

PART B **20 Marks**

B1 **10 Marks**

Run Length Encoding (RLE) is a lossless data compression technique which runs on sequences having same value occurring consecutive times. You need to consider a data sequence comprising of at least 50 characters with certain characters occurring consecutively. Compute the compressed value using RLE compression. Develop an algorithm / flowchart for RLE implementation.

RAMAIAH UNIVERSITY OF APPLIED SCIENCES

Document the following:

- **B1.1** Introduction
- **B1.2** Algorithm / Flowchart for RLE computation
- **B1.3** Computation of compressed value of considered data using RLE compression
- **B1.4** Conclusion

B2 **10 Marks**

Develop a program to achieve data compression using RLE. Test the working of the program with data considered in Part B1. The answer should comprise of the following:

Document the following:

- **B2.1** Introduction
- **B2.2** Implementation of RLE with explanation
- **B2.3** Testing of RLE implementation and explanation of obtained output
- **B2.4** Conclusion