Faculty of Engineering and Technology			
Ramaiah University of Applied Sciences			
Department	Computer Science and Engineering	Programme	B. Tech
Semester/Batch	03/2019		
Course Code	CSC202A	Course Title	Data structure and Algorithms
Course Leader	Vaishali R Kulkarni, Dr Pushphavathi T P, G. Roopa		

Assignment - 01			
Register No		Name of Student	

Sections		Marking Scheme	Marks		
			Max Marks	First Examiner Marks	Moderator Marks
Part-A					
	A 1.1	Static memory allocation	01		
	A 1.2	Dynamic memory allocation	02		
	A 1.3	Comparative analysis	02		
		Part-A Max Marks	**05**		
Part B 1					
	B 1.1	Classful addressing in networks	02		
	B 1.2	Data structures used	04		
	B 1.3	Validated C Program	04		
		Part-B 1 Max Marks	**10**		
Part B 2					
	B2.1	Plagiarism rules and threshold	02		
	B2.2	Pseudocode for checking plagiarized content	04		
	B2.3	Validated C Program	04		
		Part-B 2 Max Marks	**10**		

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Course Marks Tabulation				
Component- CET B Assignment	**First Examiner**	**Remarks**	**Second Examiner**	**Remarks**
A				
B.1				
B.2				
Marks (Max 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.

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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 are **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 1 page only.
6. Restrict your report for Part-B to a maximum of 10 pages.
7. The printed assignment must be submitted to the course leader.
8. **Submission Date: 04 /10 /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 structures and algorithms course is aimed at preparing the students to understand and apply the principles of data structures and algorithms, implement standard data structures and develop algorithms for efficient computer programs. A broad range of abstract data types as well as algorithms for data storage, access and manipulation used in program development are taught. Students are trained to develop applications using appropriate ADTs and algorithms, analyze them and generate an analytical report.

PART – A **5**

Marks

Data structures are designed to organize and access data for efficient operations by algorithms. Data structures help in making data available using operations and assist the computer to understand human-generated documents and artifacts of all kinds such as speech, video, text, motion, biometrics etc. Memory allocation for data structures is very important for storing values while assigning to variables. Static memory allocation is the allocation of memory at compile time, before the associated program is executed. Dynamic memory allocation or automatic memory allocation where memory is allocated as required at run time.

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In this context, write an essay on the topic: **"Static and dynamic memory allocation using C".**

The essay should address the following:

A1.1 An example of static memory allocation

A1.2 An example of dynamic memory allocation

A1.3 Comparative analysis of both approaches in terms of their respective advantages and disadvantages.

PART – B **(20 Marks)**

B.1 **(10 Marks)**

In a computer network laboratory, each computer has an identifier to recognize connected computer address, known as IP (Internet Protocol) Address. An IP address in IPv4 has 4 octets, each having a decimal value in the range 0 to 255 and depending on the first octet's value, IP Addresses are divided into 5 classes as given below.

Class A	1	to	126
Class B	128	to	191
Class C	192	to	223
Class D	224	to	239
Class E	240	to	254

Design a C program that inputs and stores the IP address for each computer, along with the computer/host name, in a computer lab of 50 computers and determines the class of the IP address of each computer. Your report should include:

B1.1 Introduction to classful addressing in networks

B1.2 Data structures used in program

B1.3 A tested C Program which outputs each computer/host name and the class of its IP address

B.2 **(10 Marks)**

Plagiarism is a serious problem in research ethics. Technology has been both a miracle and a curse in terms of plagiarism. No doubt, it has become easier to find the required information and copy it. Since people often do that without attribution, it has also become easier to identify and deal with plagiarism. Implement a simple plagiarism detector. The detector accepts as input a corpus of existing documents and a potentially plagiarized document. Develop a C program that performs the plagiarism check and determines the copied text and its sources.

Your report should include the following:

B2.1 Plagiarism rules

B2.2 Example of plagiarized paragraph in a document

B2.3 A tested C Program