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	CSC211A	**Course Title**	Formal Languages and Automata Theory
Course Leader	P.Padma Priya Dharishini, Prakash P.		

Assignment no 2

Name of Student		Register No	

Sections		Marking Scheme	Max Marks	First Examiner Marks	Second Examiner Marks
Part-A	A1.1	Introduction	01		
	A1.2	Discussion on FLAT aids in designing compilers for programming languages	3		
	A1.3	Conclusion	1		
		Part-A Max Marks	**5**		
Part B 1	B1.1	Introduction and problem definition	01		
	B1.2	Problem solving approach	02		
	B1.3	Design and validation	05		
	B1.4	Concluding remarks (Summary, limitations and improvements)	02		
		B.1 Max Marks	10		
Part B 2	B2.1	Introduction and problem definition	01		
	B2.2	Problem solving approach	02		
	B2.3	Design and validation	05		
	B2.4	Concluding remarks (Summary, limitations and improvements)	02		
		B.2 Max Marks	**10**		
		Total Assignment Marks	**25**		

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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.

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Assignment – 2

Term - 2

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 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 subject leader.
8. **Submission Date: 18 MARCH 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:

This Course is intended to develop an understanding of the concepts of automata theory and formal languages and their relationship to computation models. Students are taught regular, context-free, context-sensitive and universal languages, their generating grammars and properties along with the related automata and machine models. Formal relationships among machines, languages and grammars are covered. Students are trained to design automata and machine models for a given formal language requirements.

PART A **5 Marks**

Preamble

Most of the programming languages use compiler to convert source program to machine understandable code. Each programming languages has specific compiler, some are machine dependent and machine independent. Researchers believe that automata theory play a vital part in designing a compiler phases.

In this context, develop an essay on **"Formal Language and Automata theory (FLAT) aids in designing the Compilers for Programming Languages"**

Your essay should comprise the following:

A1.1 Introduction

A1.2 Discussion on FLAT aids in designing compilers for programming languages

A1.3 Conclusion

PART B **20 Marks**

B1 **10 Marks**

Consider a simple Seat Belt Controller (SBC). The requirements for SBC are the following:

- Initially SBC is in idle state
- when a person is seated, not fasten the seat belt within 'x' time units and engine is ON, SBC is responsible for automatically switch off the engine

- On fastening of seat belt, SBC allow the person to switch ON the engine
- when a person is seated, not fasten the seat belt within 'x' time units and engine is OFF, SBC is responsible for raising an alarm
- On fastening of seat belt, SBC has to switch off the alarm
- When a person is not in seat then SBC has to be in idle state

Design a Push down automata for SBC based on the given requirements.

Document the following:

B1.1 Introduction

B1.2 Problem solving approach

B1.3 Design and validation

B1.4 Concluding remarks (Summary, limitations and improvements)

B2 **10 marks**

Develop a Context Free Grammar (CFG) to satisfy the given requirements in **PART** - **B1**.

Document the following:

B2.1 Introduction

B2.2 Problem solving approach

B2.3 Design and validation

B2.4 Concluding remarks (Summary, limitations and improvements)